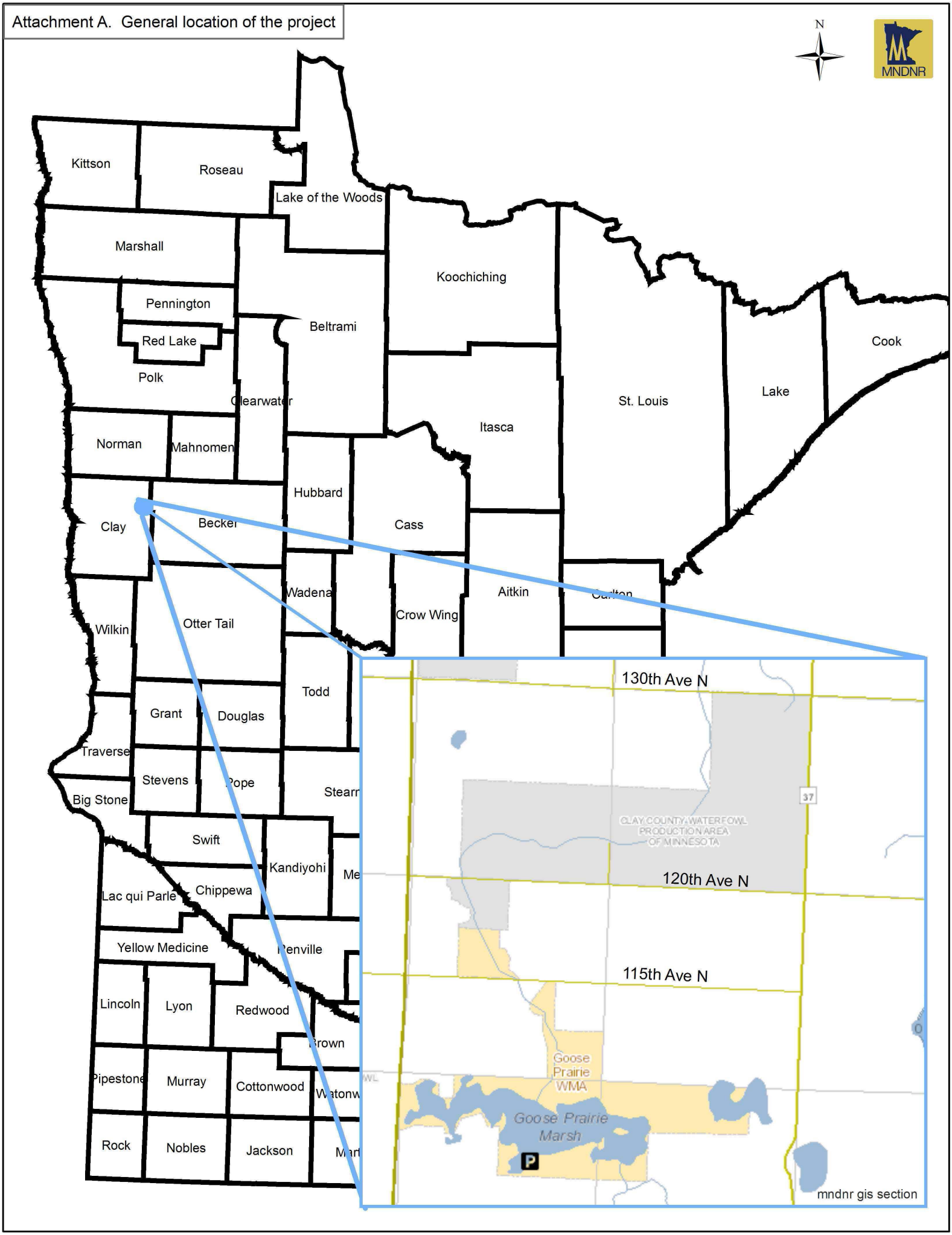
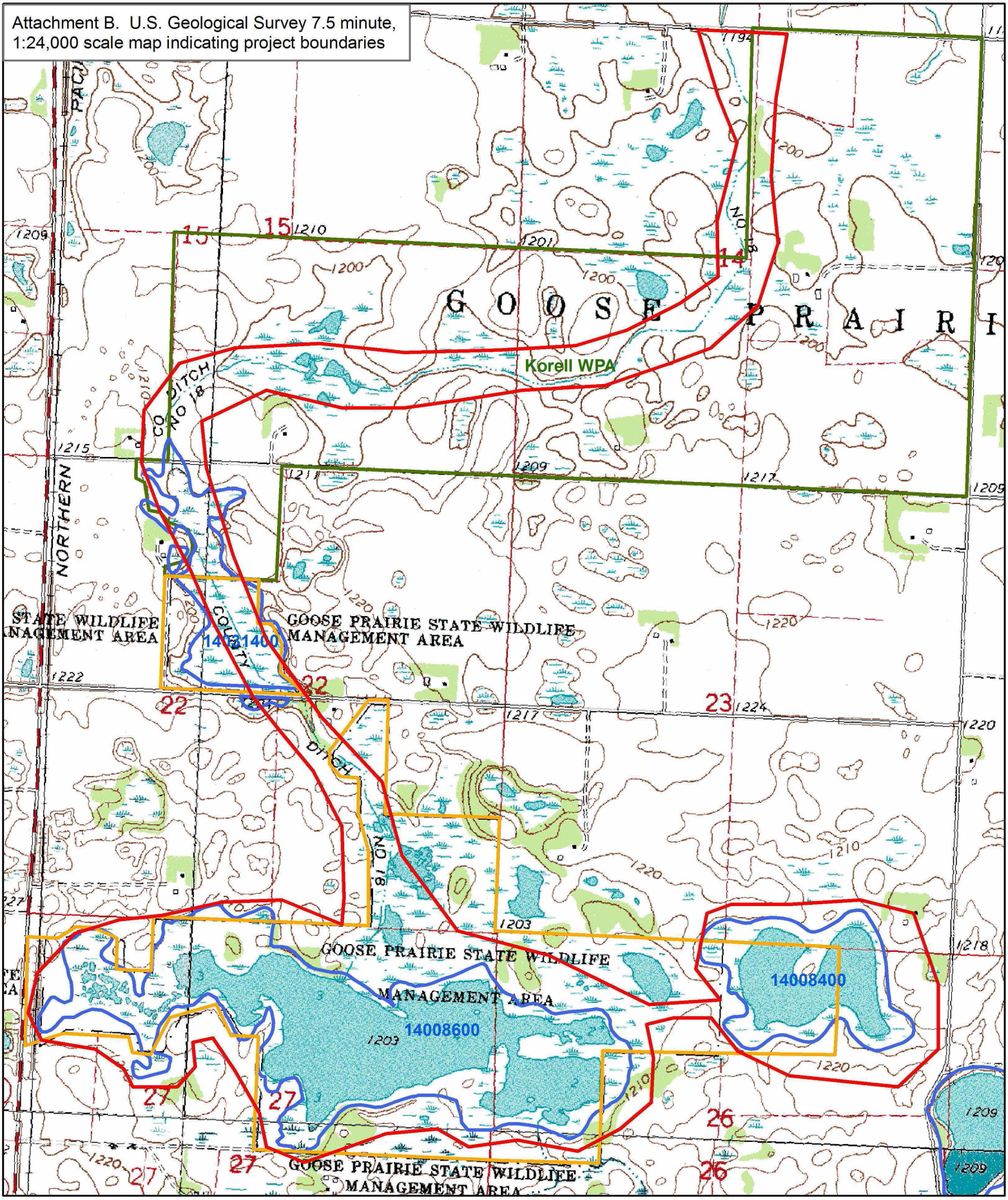
Attachment A. General location of the project



Attachment B. U.S. Geological Survey 7.5 minute, 1:24,000 scale map indicating project boundaries



State Wildlife Management Area
USFWS Waterfowl Production Areas
Public Waters Basins
Project Area

0 500 1,000 2,000 Feet

N

MNDNR

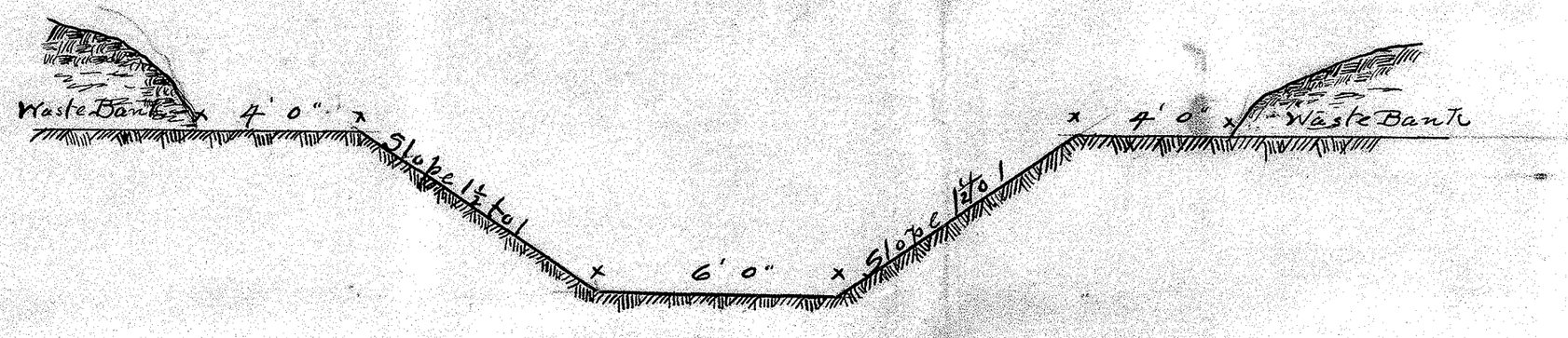
Attachment C. Original Clay County Ditch 18 Project Map -

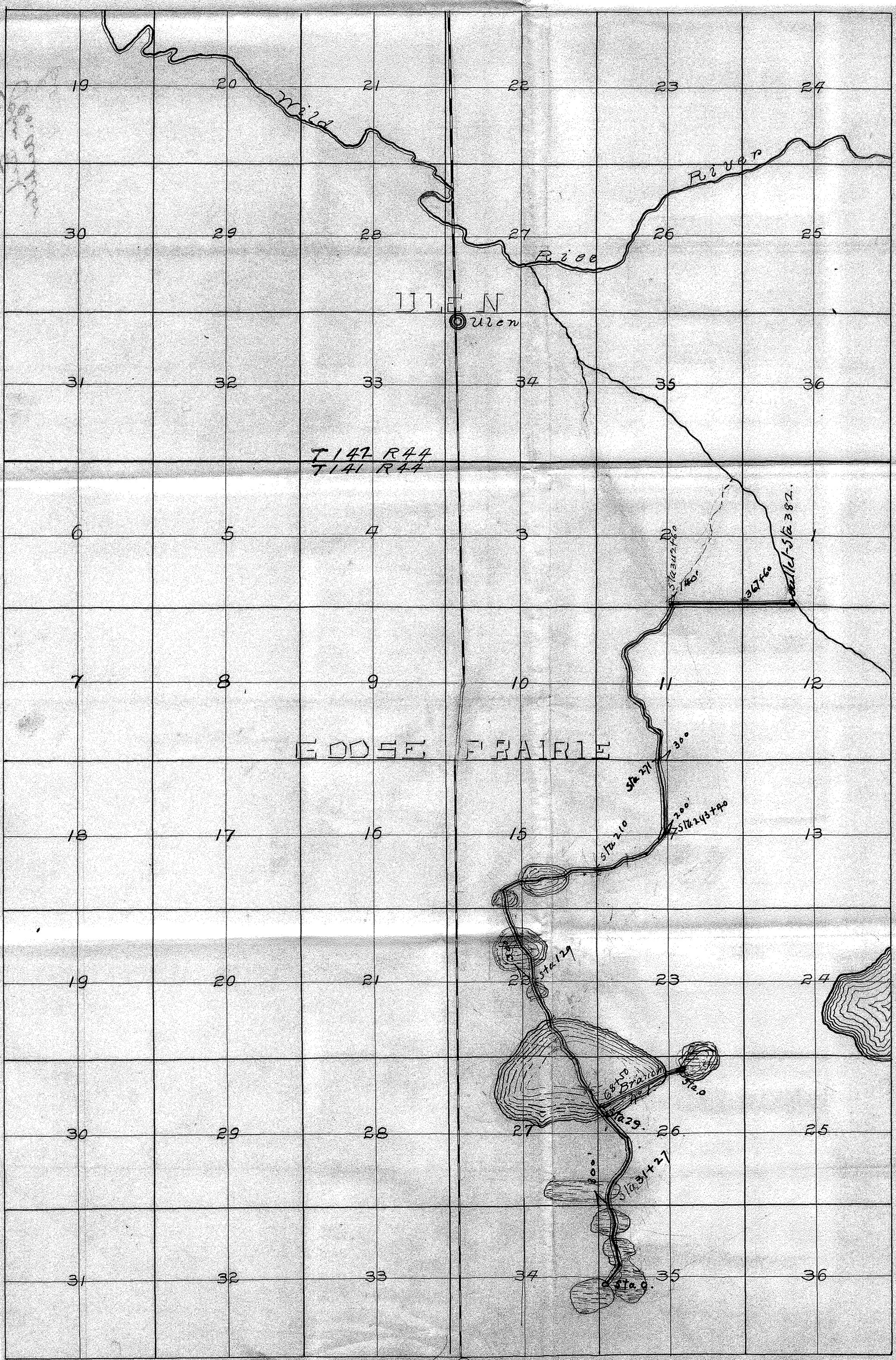
Ex. L.

MAP
OF
CLAY COUNTY
DITCH No. 18.

Scale = 2640 ft = 1 inch.

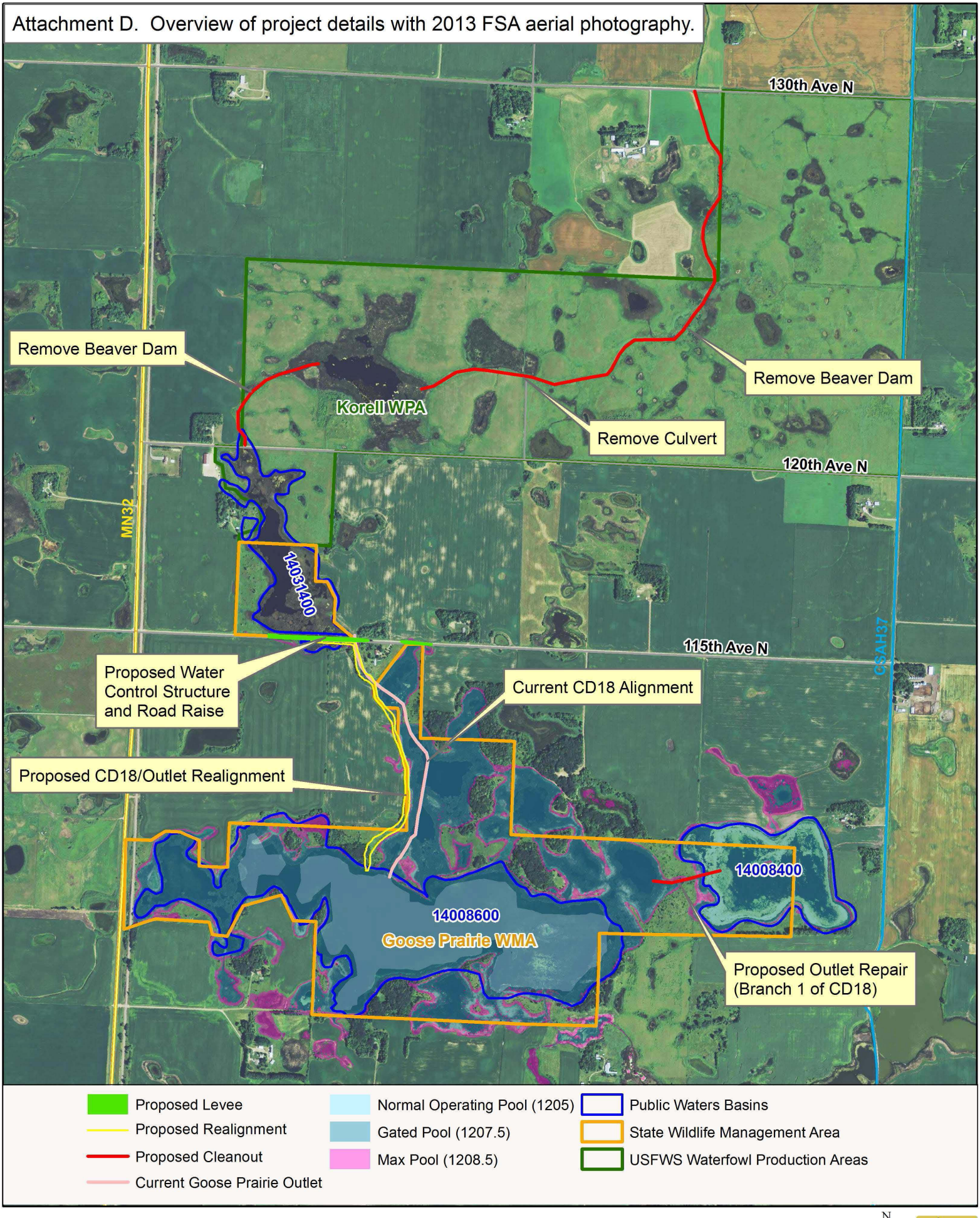
Cross-Section of Ditch at Station No 194



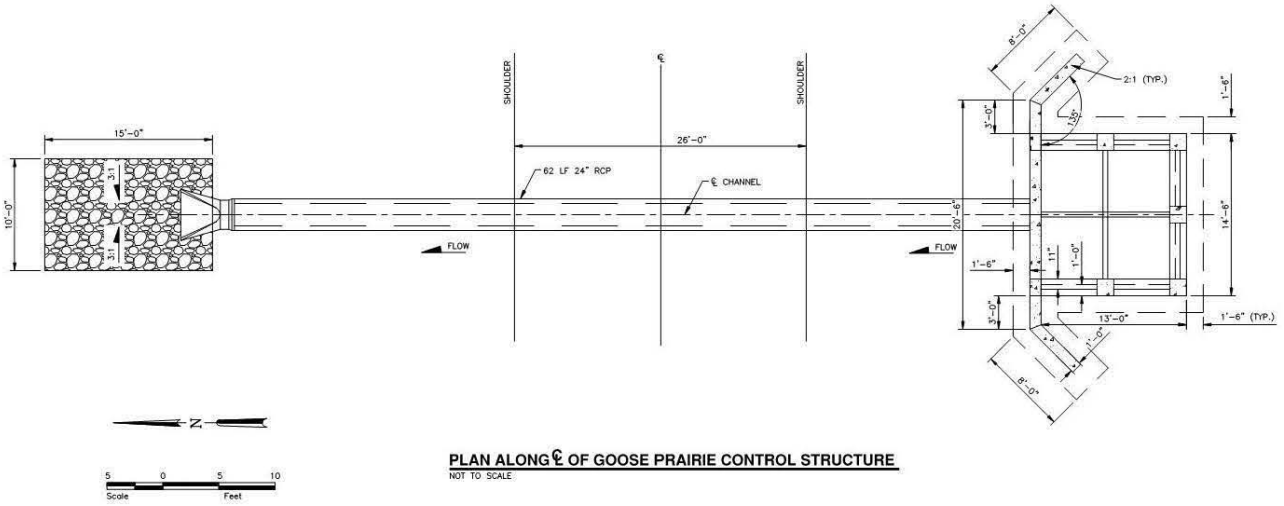


TILE 89 TO 98
114 - 132
198 - 220
5200 FEE

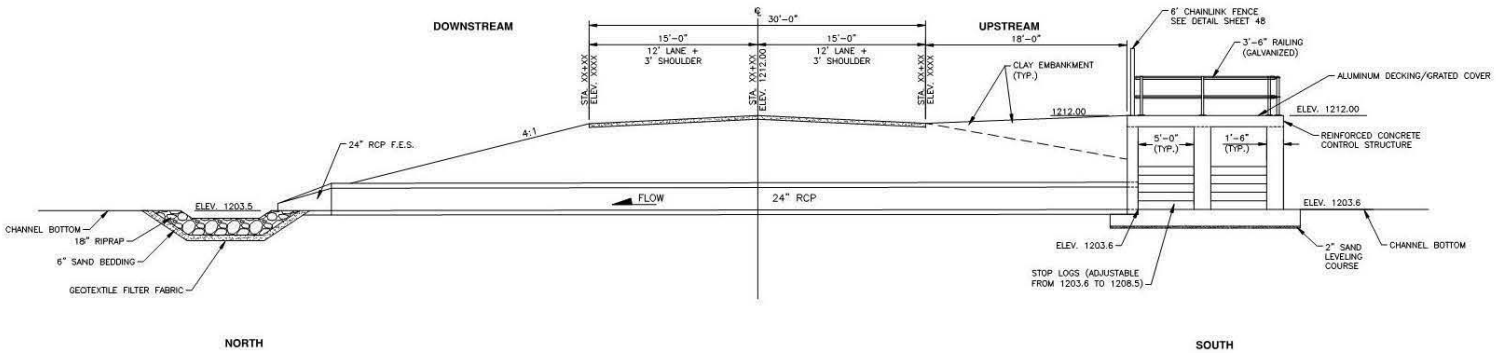
NO CUTS AFTER 224


Attachment D. Overview of project details with 2013 FSA aerial photography.
130th Ave N
Remove Beaver Dam
Remove Beaver Dam
Korell WPA
Remove Culvert
120th Ave N
MN32
14031400
115th Ave N
CSAH37
Proposed Water Control Structure and Road Raise
Current CD18 Alignment
Proposed CD18/Outlet Realignment
14008400
14008600
Goose Prairie WMA
Proposed Outlet Repair (Branch 1 of CD18)
Proposed Levee
Proposed Realignment
Proposed Cleanout
Current Goose Prairie Outlet
Normal Operating Pool (1205)
Gated Pool (1207.5)
Max Pool (1208.5)
Public Waters Basins
State Wildlife Management Area
USFWS Waterfowl Production Areas
0
1,250
2,500
5,000 Feet
N
MNDNR

Attachment E. Water Control Structure Detail



PLAN ALONG ℄ OF GOOSE PRAIRIE CONTROL STRUCTURE
NOT TO SCALE



PROFILE ALONG ℄ OF GOOSE PRAIRIE CONTROL STRUCTURE
NOT TO SCALE

No.	Revision	Date	By

Houston Engineering Inc.
Fargo
P: 701.237.5065
F: 701.237.5101

Drawn by	Date
AJK	02/11/14
Checked by	Scale
MVP/JB	AS SHOWN

GOOSE PRAIRIE WMA (PRELIMINARY OUTLET STRUCTURE)
WILD RICE WATERSHED DISTRICT
ADA, MINNESOTA

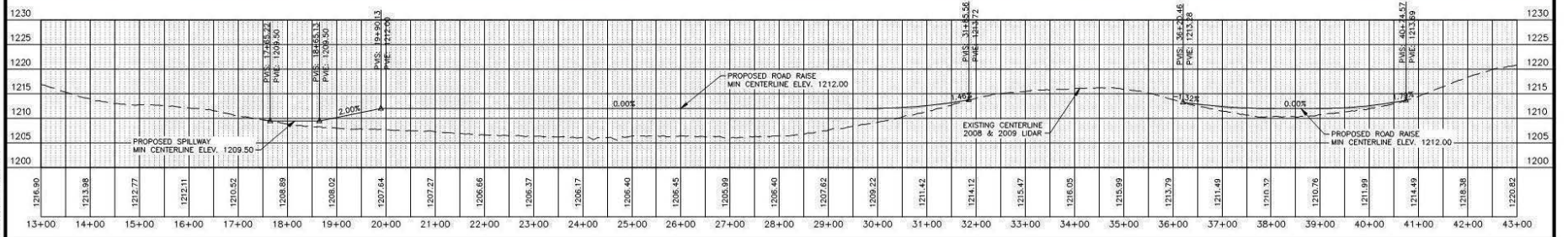
PRINCIPAL SPILLWAY DETAIL

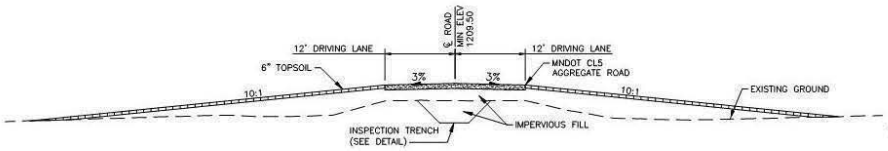
PROJECT NO. 1432-354

SHEET 1 of 1

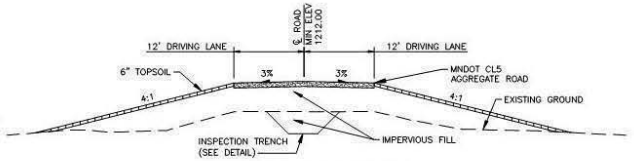
Z:\1400\1432\00_1432_354\CAD\Plans\CONTROL STRUCTURE.dwg - CONTROL STRUCTURE - 2/26/2014 4:35 PM (ohanson)

Attachment F. Detail of dike alignment and road raise





SPILLWAY PAVEMENT CROSS SECTION
NOT TO SCALE



PAVEMENT CROSS SECTION
NOT TO SCALE

No.	Revision	Date	By

Houston Engineering Inc.

Fargo
P: 701.237.5065
F: 701.237.5101

Drawn by: RGE | Date: 10-28-13
Checked by: JDB | Scale: AS SHOWN

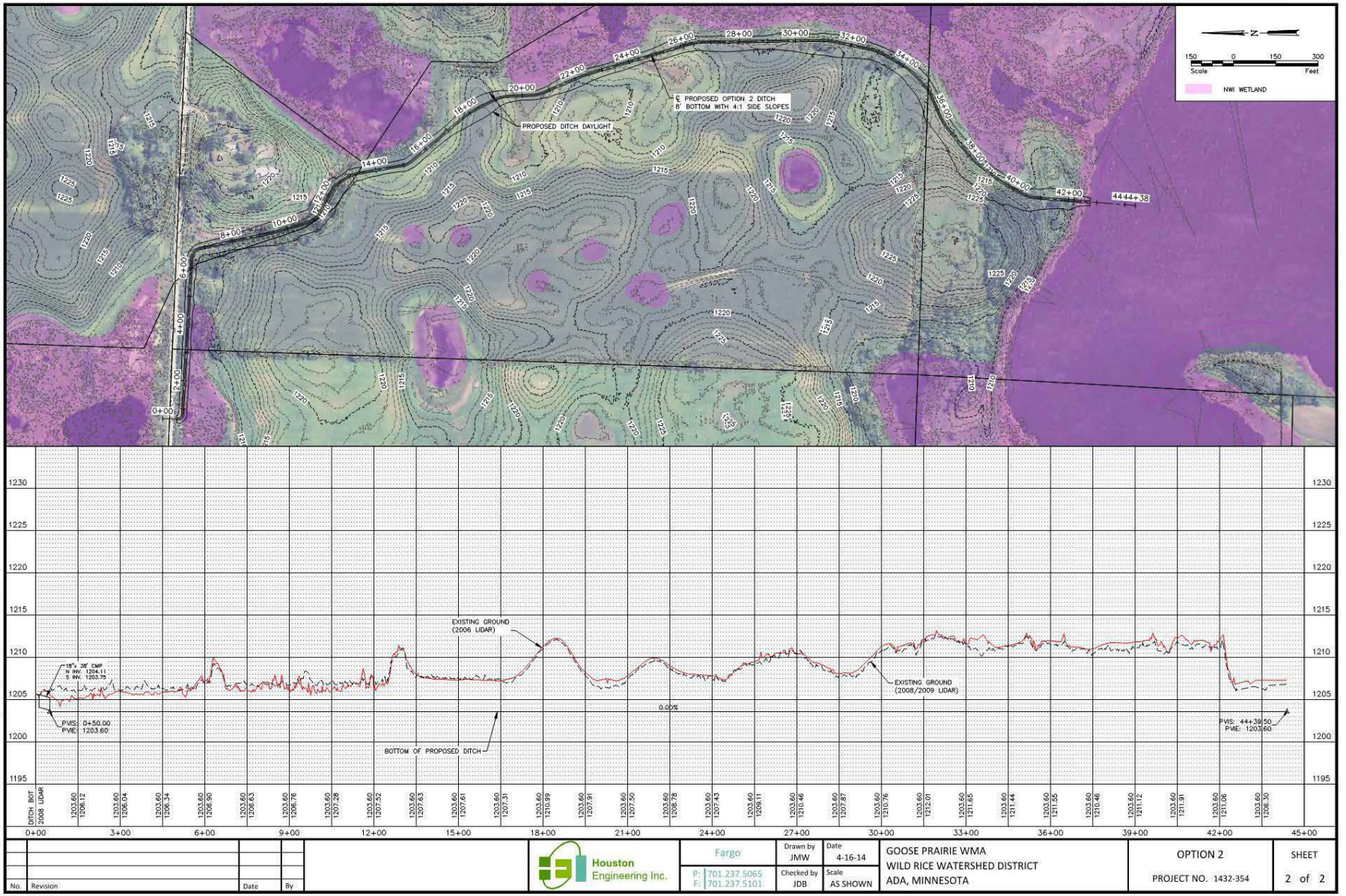
GOOSE PRAIRIE WMA
WILD RICE WATERSHED DISTRICT
ADA, MN

OPTION 1
SITE PLAN
PROJECT NO. 1432-354

SHEET 2 of 3

C:\Users\rengelstad\Desktop\3401-354\Option 1 site plan.dwg - 11x17-10/29/2013 5:43 PM -rengelstad

Attachment G. Preferred outlet realignment configuration with existing and proposed profiles.



No.	Revision	Date	By

Houston Engineering Inc.
Fargo
P: 701.237.5065
F: 701.237.5101

Drawn by	Date
JMW	4-16-14
Checked by	Scale
JDB	AS SHOWN

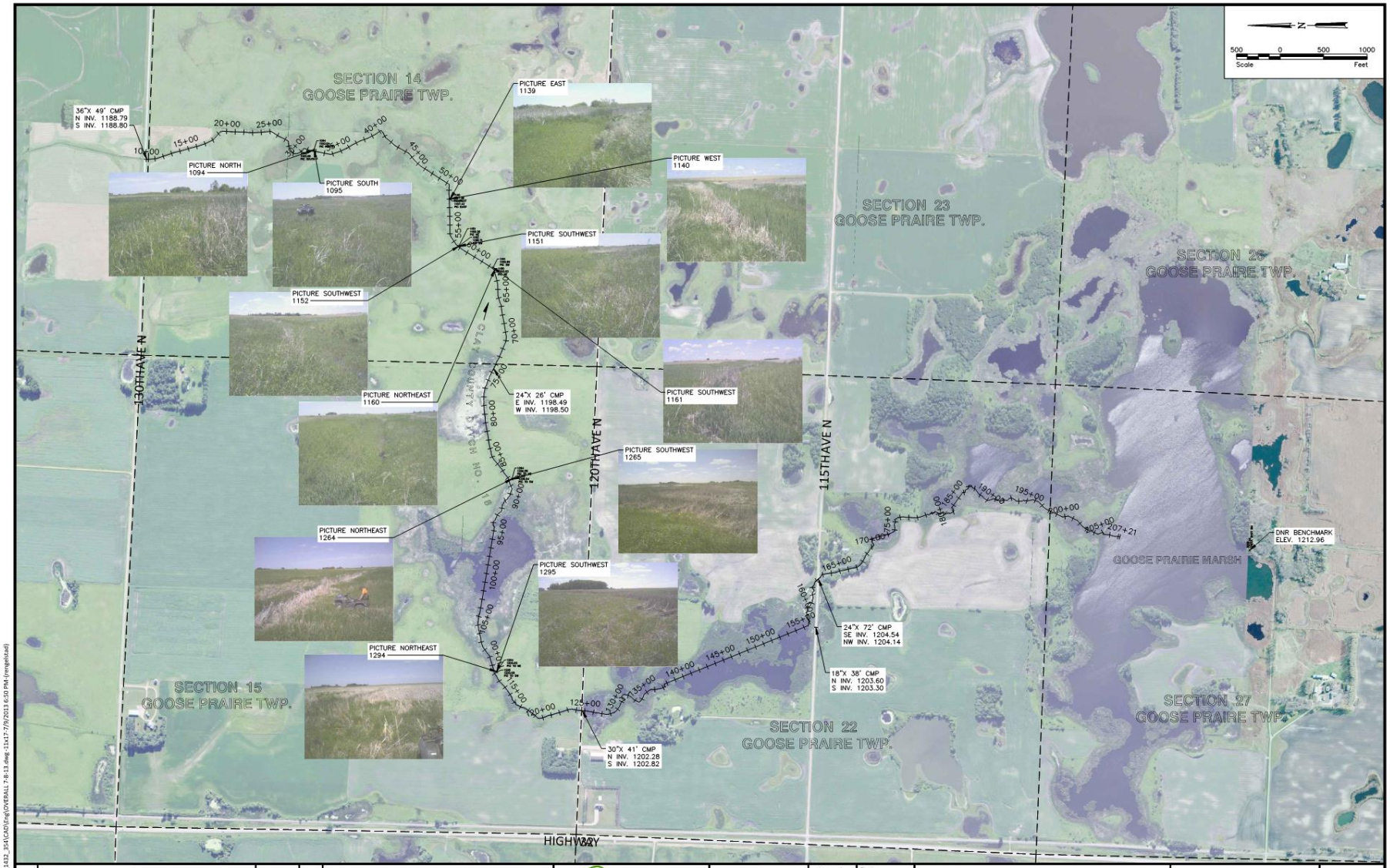
GOOSE PRAIRIE WMA
WILD RICE WATERSHED DISTRICT
ADA, MINNESOTA

OPTION 2
PROJECT NO. 1432-354

SHEET
2 of 2

Z:\1400\1432\00_3432_354\CAD\Plan\PLAN AND PROFILE Ditch Option 2.dwg - 11x17-4/22/2014 10:37 AM (jwegnum)

Attachment H. County Ditch 18 Survey



No.	Revision	Date	By

Houston Engineering Inc.
Fargo
P: 701.237.5065
F: 701.237.5101

Drawn by	Date
JMW	7-8-13
Checked by	Scale
RGE	AS SHOWN

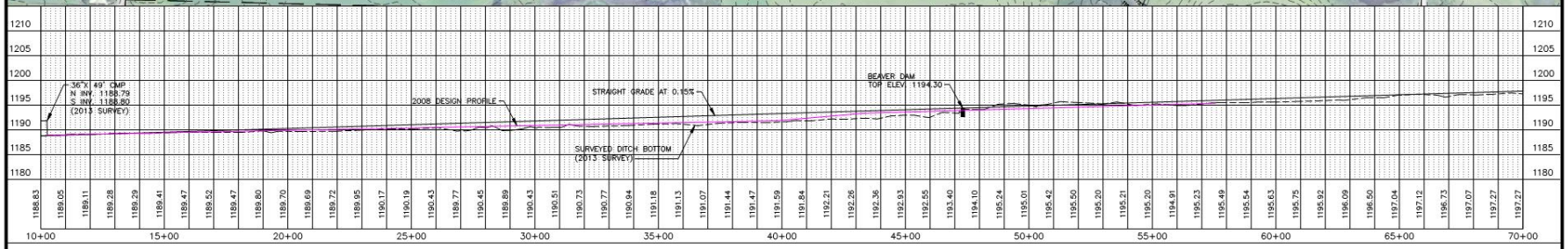
GOOSE PRAIRIE WMA
WILD RICE WATERSHED DISTRICT
ADA, MN

OVERALL ALIGNMENT
PROJECT NO. 1432-354

SHEET
1 of 6

Z:\14001\1432\00_1432_354\CAD\Eng\OVERALL 7-8-13.dwg - 11x17-7/9/2013 6:50 PM (rmgottlieb)

Attachment H. County Ditch 18 Survey



No.	Revision	Date	By

Houston Engineering Inc.

Fargo
P: 701.237.5065
F: 701.237.5101

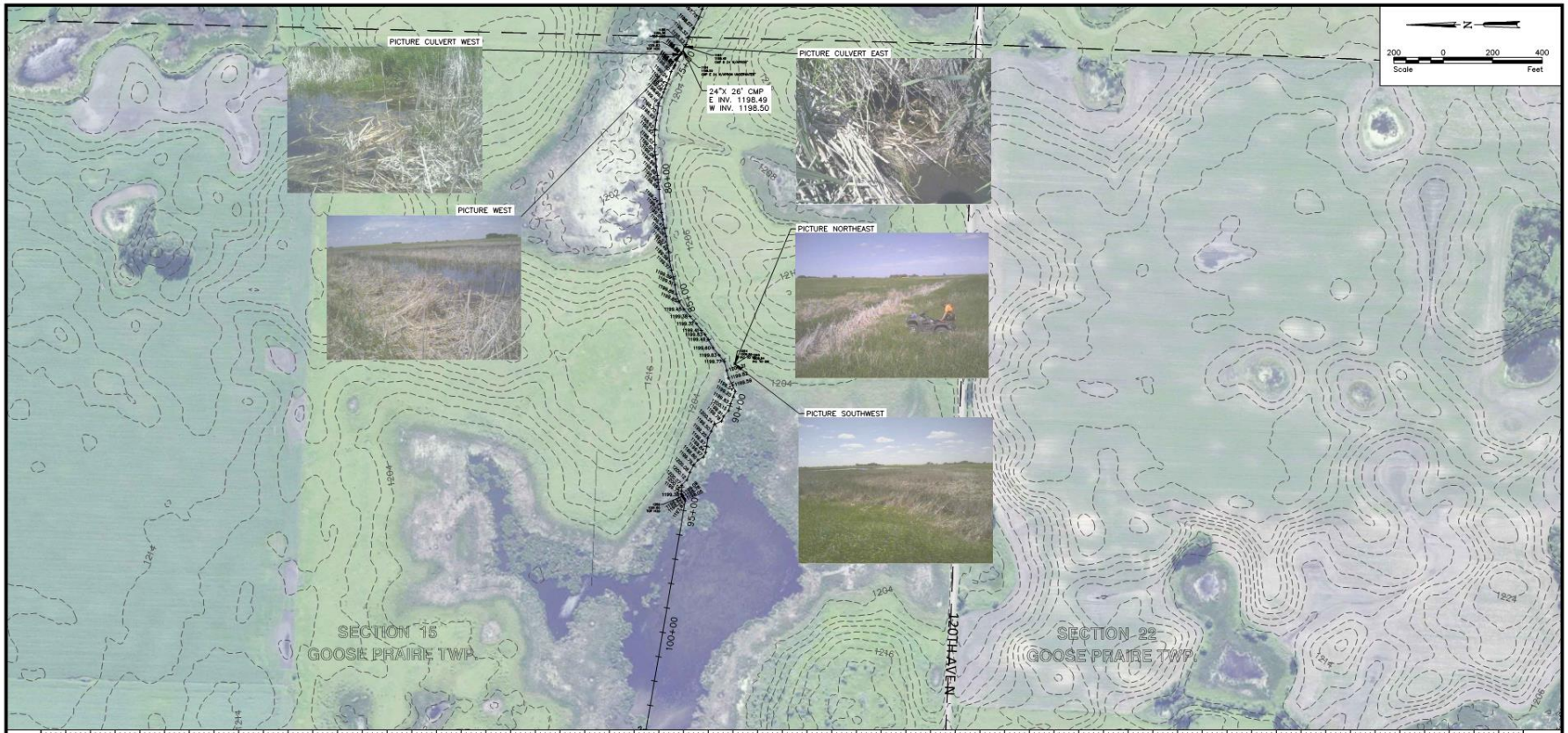
Drawn by JMW | Date 7-8-13
Checked by RGE | Scale AS SHOWN

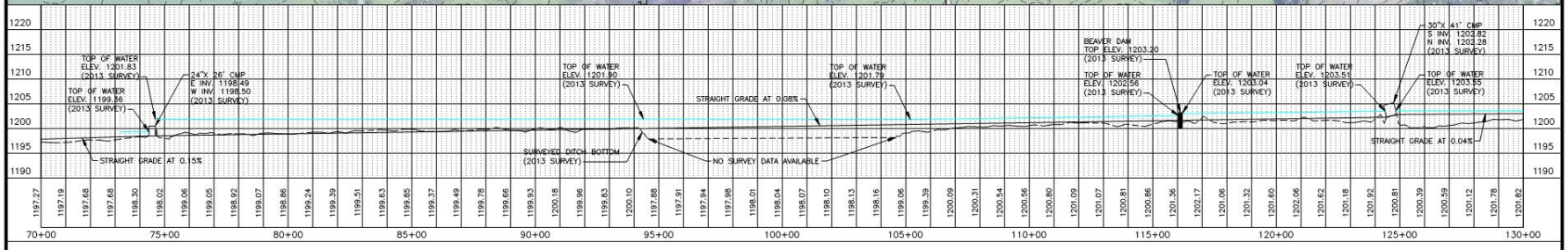
GOOSE PRAIRIE WMA
WILD RICE WATERSHED DISTRICT
ADA, MN

PLAN AND PROFILE
PROJECT NO. 1432-354

SHEET 2 of 6

Attachment H. County Ditch 18 Survey





No.	Revision	Date	By

Houston Engineering Inc.
Fargo
P: 701.237.5065
F: 701.237.5101

Drawn by	Date
JMW	7-8-13
Checked by	Scale
RGE	AS SHOWN

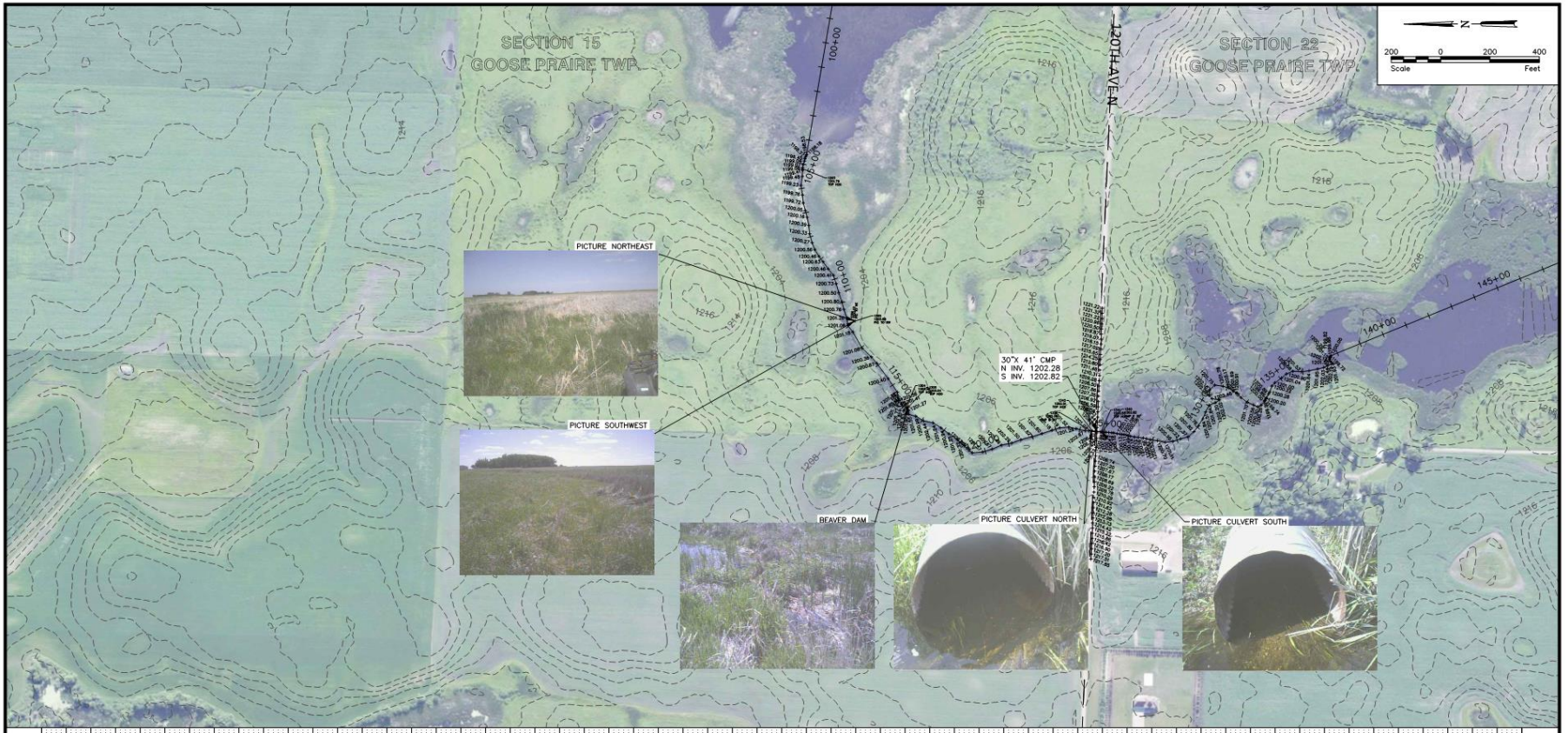
GOOSE PRAIRIE WMA
WILD RICE WATERSHED DISTRICT
ADA, MN

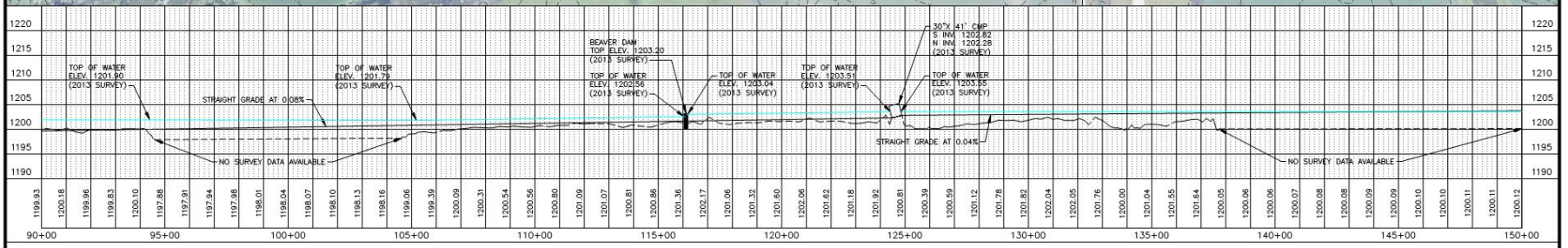
PLAN AND PROFILE
PROJECT NO. 1432-354

SHEET 3 of 6

Z:\1400\1432\00_1432_354\CAD\Eng\PLAN AND PROFILE 7-9-13.dwg - 7/9/2013 6:20 PM (rengelstad)

Attachment H. County Ditch 18 Survey





No.	Revision	Date	By

Houston Engineering Inc.
Fargo
P: 701.237.5065
F: 701.237.5101

Drawn by	Date
JMW	7-8-13
Checked by	Scale
RGE	AS SHOWN

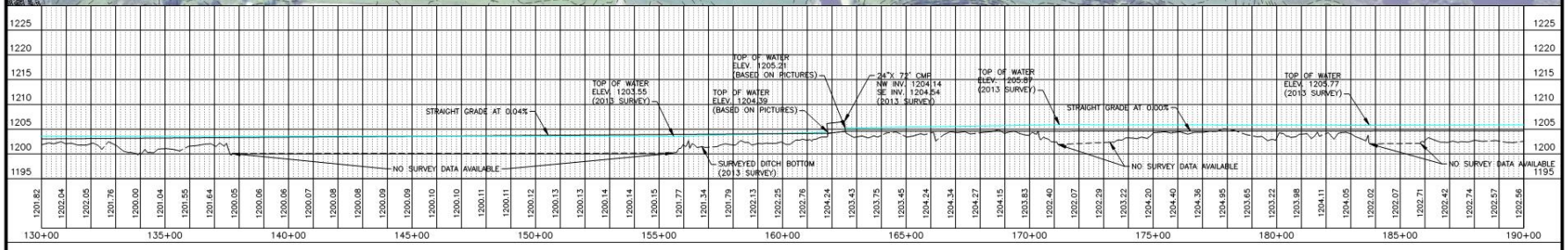
GOOSE PRAIRIE WMA
WILD RICE WATERSHED DISTRICT
ADA, MN

PLAN AND PROFILE
PROJECT NO. 1432-354

SHEET 4 of 6

Z:\1400\1432\00_1432_354\CAD\Eng\PLAN AND PROFILE 7-9-13.dwg -3-7/9/2013 6:34 PM (rengelstad)

Attachment H. County Ditch 18 Survey



No.	Revision	Date	By

Houston Engineering Inc.
Fargo
P: 701.237.5065
F: 701.237.5101

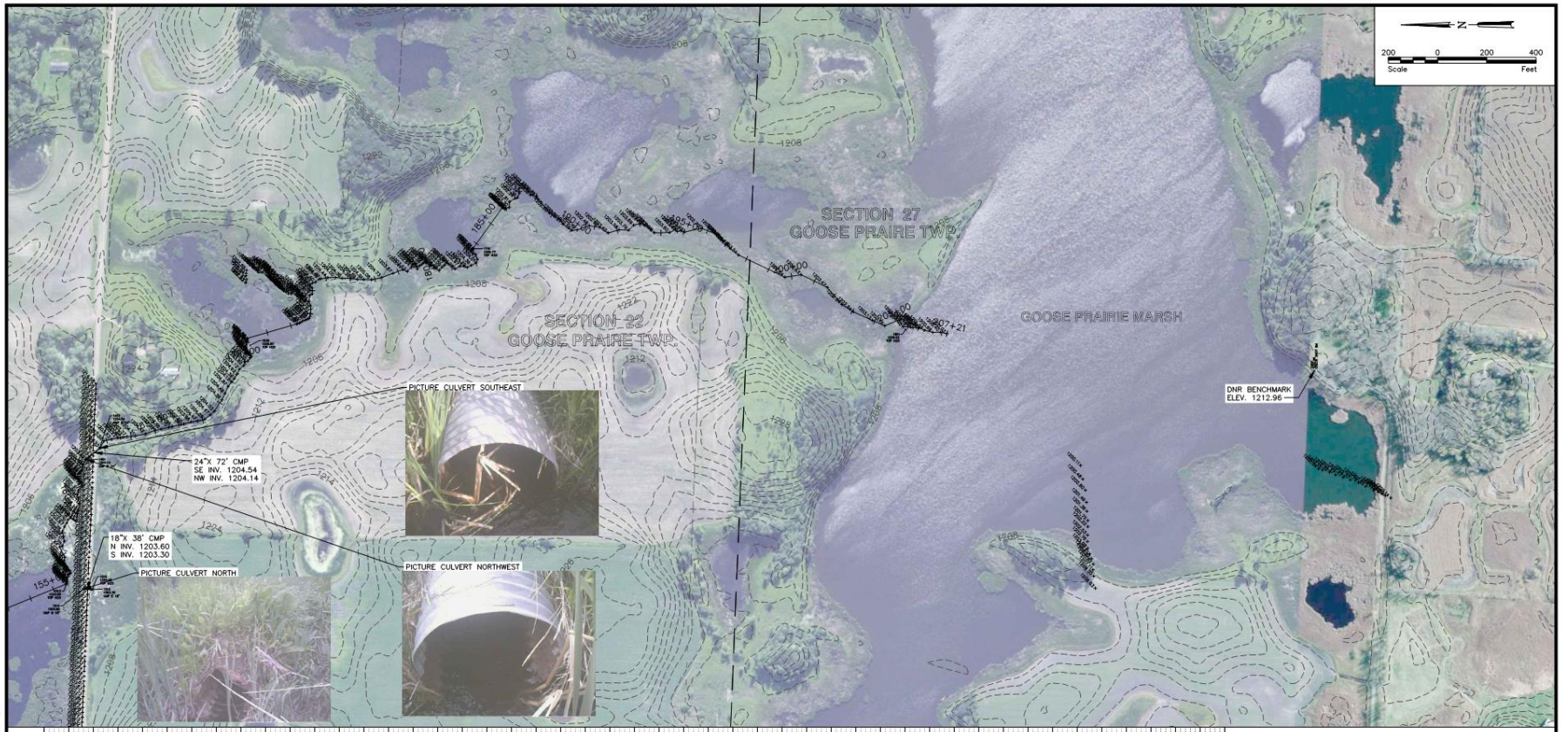
Drawn by	Date
JMW	7-8-13
Checked by	Scale
RGE	AS SHOWN

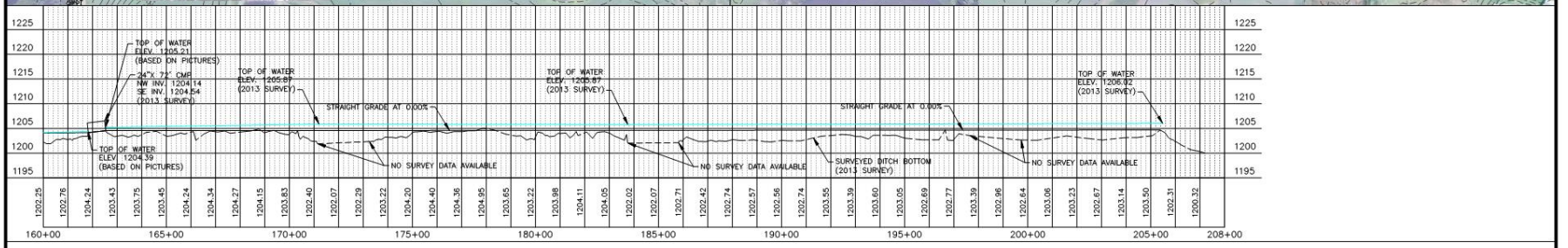
GOOSE PRAIRIE WMA
WILD RICE WATERSHED DISTRICT
ADA, MN

PLAN AND PROFILE
PROJECT NO. 1432-354

SHEET 5 of 6

Attachment H. County Ditch 18 Survey





No.	Revision	Date	By

Houston Engineering Inc.

Fargo
P: 701.237.5065
F: 701.237.5101

Drawn by JMW | Date 7-8-13
Checked by RGE | Scale AS SHOWN

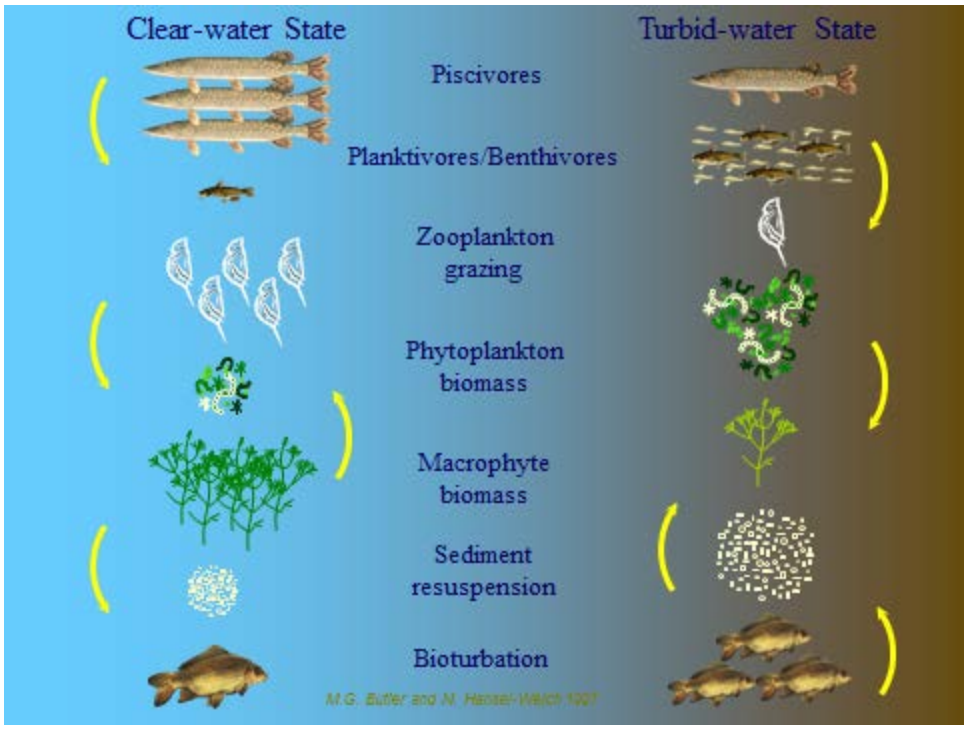
GOOSE PRAIRIE WMA
WILD RICE WATERSHED DISTRICT
ADA, MN

PLAN AND PROFILE
PROJECT NO. 1432-354

SHEET
6 of 6

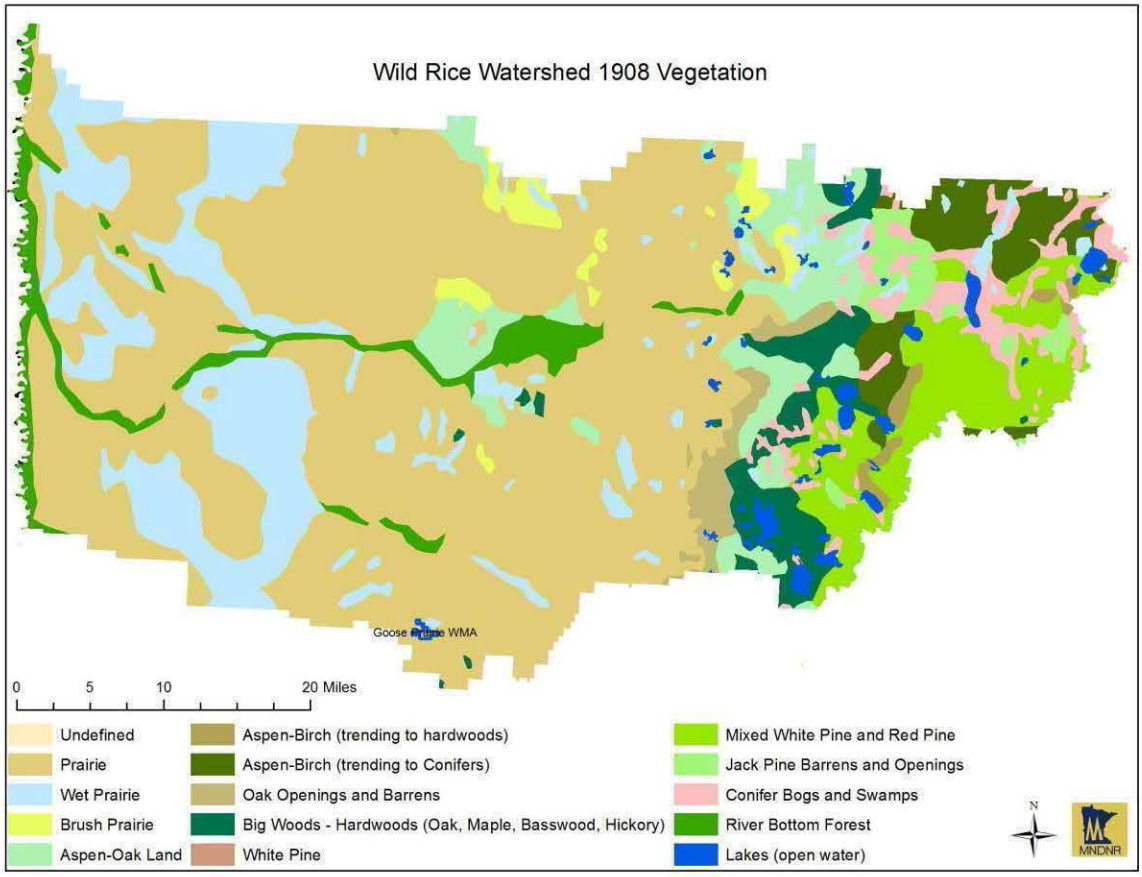
Z:\1400\1432\00_1432_254\CAD\Eng\PLAN AND PROFILE 7-9-13.dwg, 5-7/9/2013 6:42 PM, (engelstad)

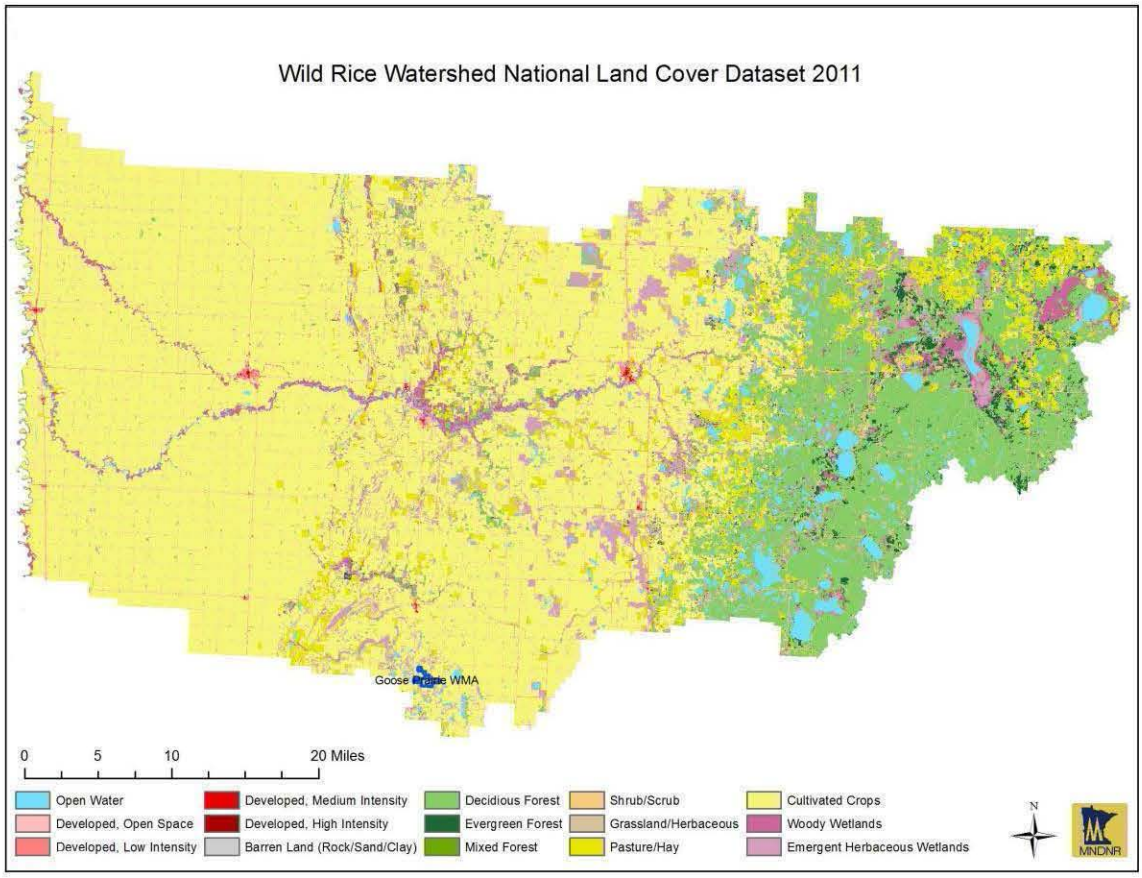
Attachment I. Illustration of alternative stable states in shallow lakes.



In the clear-water state, the fish community is characterized by predatory fish (if present), smaller fish are less abundant, zooplankton are abundant and filter feed on algae, plants are abundant and bottom-feeding fish are not abundant. Aquatic plants protect the bottom sediments from the wind and feeding activities of bottom feeding fish. In the turbid-water state, smaller fish that feed heavily on invertebrates dominate the fish community. Algae are abundant and shade out the aquatic plants. Sediments are easily disturbed by wind and fish without the protection of plants. Arrows indicate positive feedbacks that stabilize each state.

Attachment J. Wild Rice River watershed historic vegetative cover (Marschner 1908) and 2011 National Land Cover Dataset.





NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations tables in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures.** Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures in this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 14. The **horizontal datum** was NAD 83, GRS 80 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information about the **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242**, or visit their website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from aerial photography produced for Clay County dated 2005 at a scale of 1:12,000 and aerial photography produced for USDA dated 2004 at a scale of 1:12,000.

The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the profile baseline, in some cases, may deviate significantly from the channel centerline or appear outside the Special Flood Hazard Area.

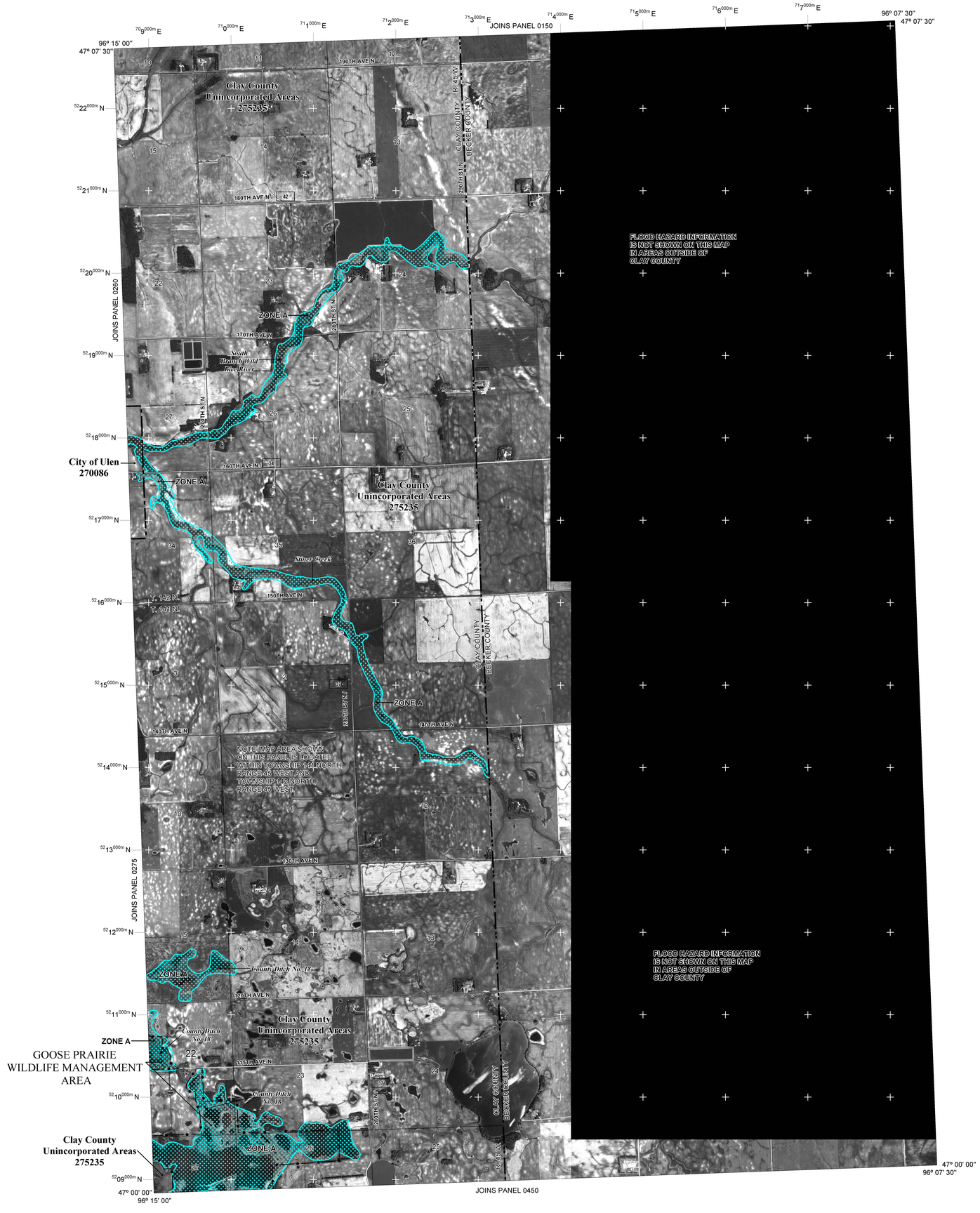
Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://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 MSC website.

If you have **questions about this map**, how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

Attachment K. Federal Emergency Management Agency (FEMA) map 27027C0300E.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

	1% annual chance floodplain boundary
	0.2% annual chance floodplain boundary
	Floodway boundary
	Zone D boundary
	CBRS and OPA boundary
	Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

A — A	Cross section line
23 — 23	Transect line
45° 02' 08", 93° 02' 12"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
4989000m N	1000-meter Universal Transverse Mercator grid values, zone 14
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
• M1.5	River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE
APRIL 17, 2012

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in 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.

MAP SCALE 1" = 2000'
1000 0 2000 4000 FEET
600 0 600 1200 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0300E

FIRM

FLOOD INSURANCE RATE MAP

CLAY COUNTY, MINNESOTA
AND INCORPORATED AREAS

PANEL 300 OF 750

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

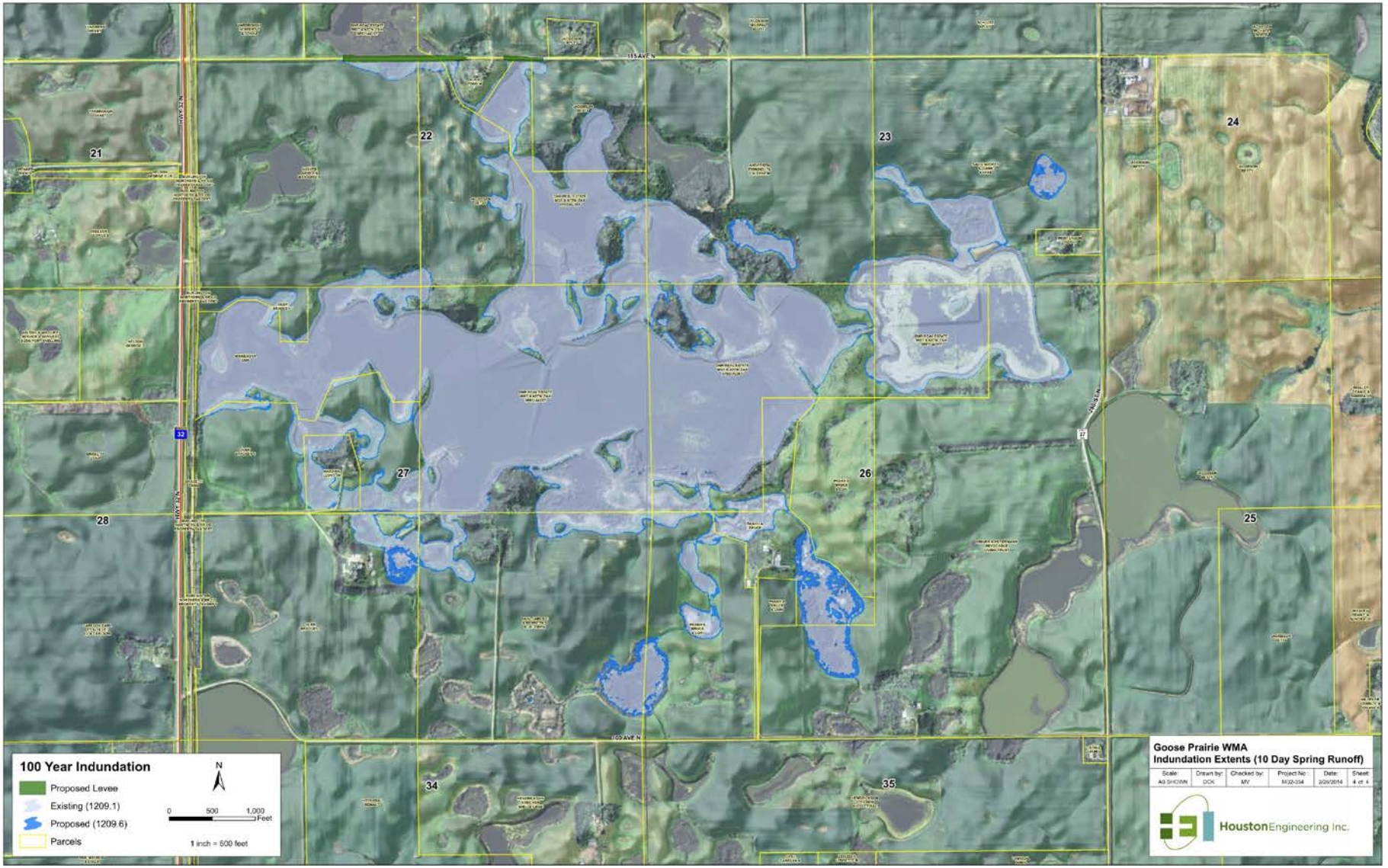
COMMUNITY	NUMBER	PANEL	SUFFIX
CLAY COUNTY	275235	0300	E
ULEN CITY, CITY OF	270086	0300	E

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

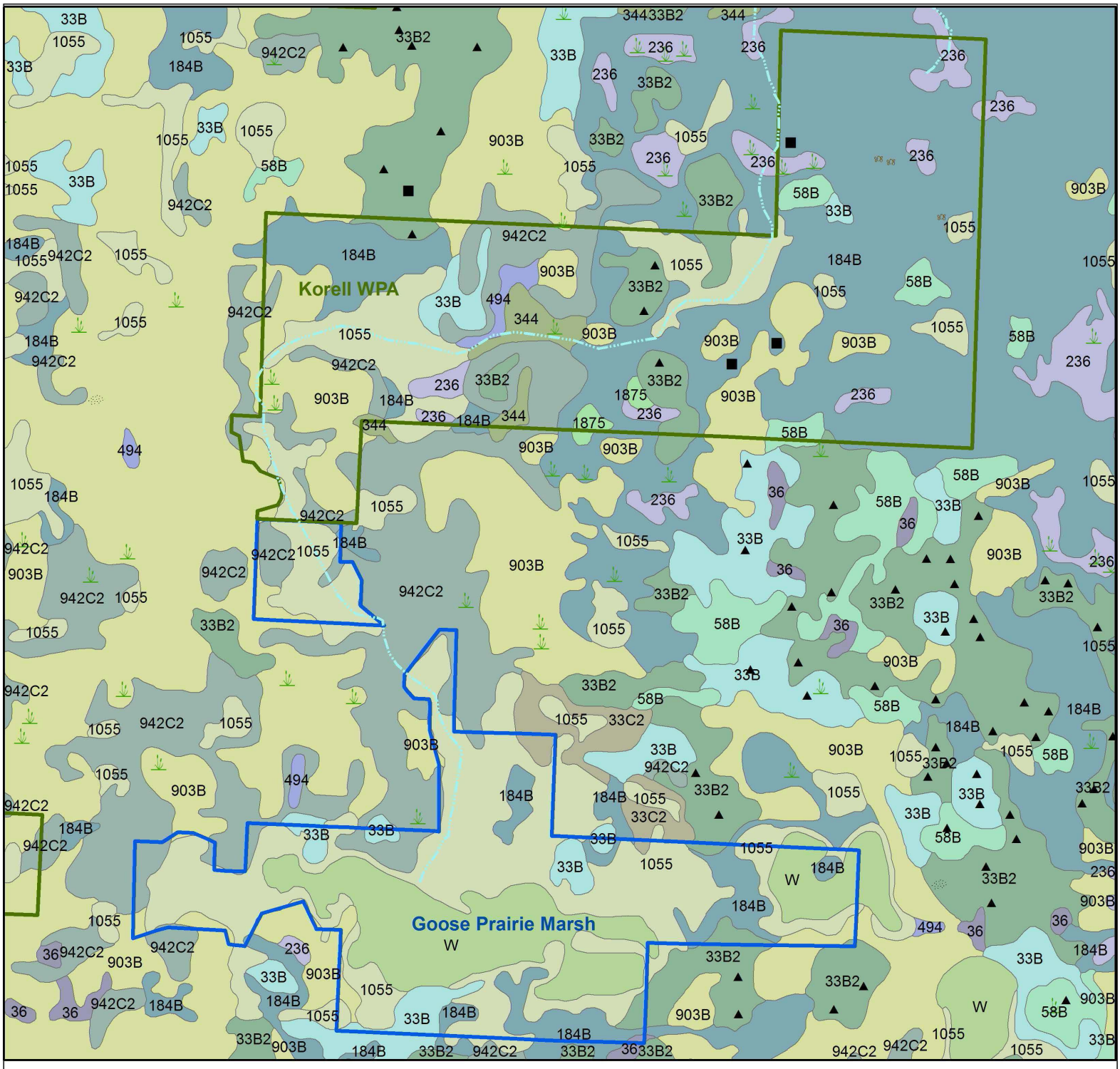
MAP NUMBER
27027C0300E
EFFECTIVE DATE
APRIL 17, 2012

Federal Emergency Management Agency

Attachment L. Flood stage inundation map.



Attachment M. Soils according to NRCS Web Soil Survey.



- ▲ Calcareous spot
- G Gravelly spot
- Marsh or swamp
- Sandy spot
- Short steep slope
- ♦ Knoll of better drained soil
- ■ Wet spot

0 1,000 2,000 Feet

- 1055 - Haplaquolls and Histosols, ponded
- 148 - Poppleton fine sand
- 184B - Hamerly loam, 1 to 4 percent slopes
- 1875 - Flom clay loam, depressional
- 236 - Vallers loam
- 33B - Barnes loam, 1 to 3 percent slopes
- 33B2 - Barnes loam, 2 to 6 percent slopes, eroded
- 33C2 - Barnes loam, 6 to 12 percent slopes, eroded
- 344 - Quam clay loam
- 36 - Flom clay loam
- 494 - Darnen loam
- 58A - Kittson fine sandy loam, 0 to 2 percent slopes
- 58B - Kittson loam, 1 to 5 percent slopes
- 903B - Barnes-Langhei loams, 1 to 6 percent slopes
- 942C2 - Langhei-Barnes loams, 6 to 12 percent slopes, eroded
- W - Water

N

MNDNR

Attachment N. Minnesota Biological Society sites of biodiversity significance and native plant communities.