

- Roads
- Railroads
- Streams
- Major Roads
- Road Raise
- Diversion Channel
- Plan B Southern Embankment
- In Town Levees
- OHB Levee
- Project Area
- Municipal Area
- Eastern Tieback Levee
- Western Tieback Levee

**Plan B Project Components
Fargo Moorhead Metro Area Flood
Risk Management - August, 2018**

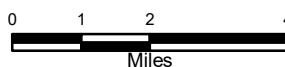
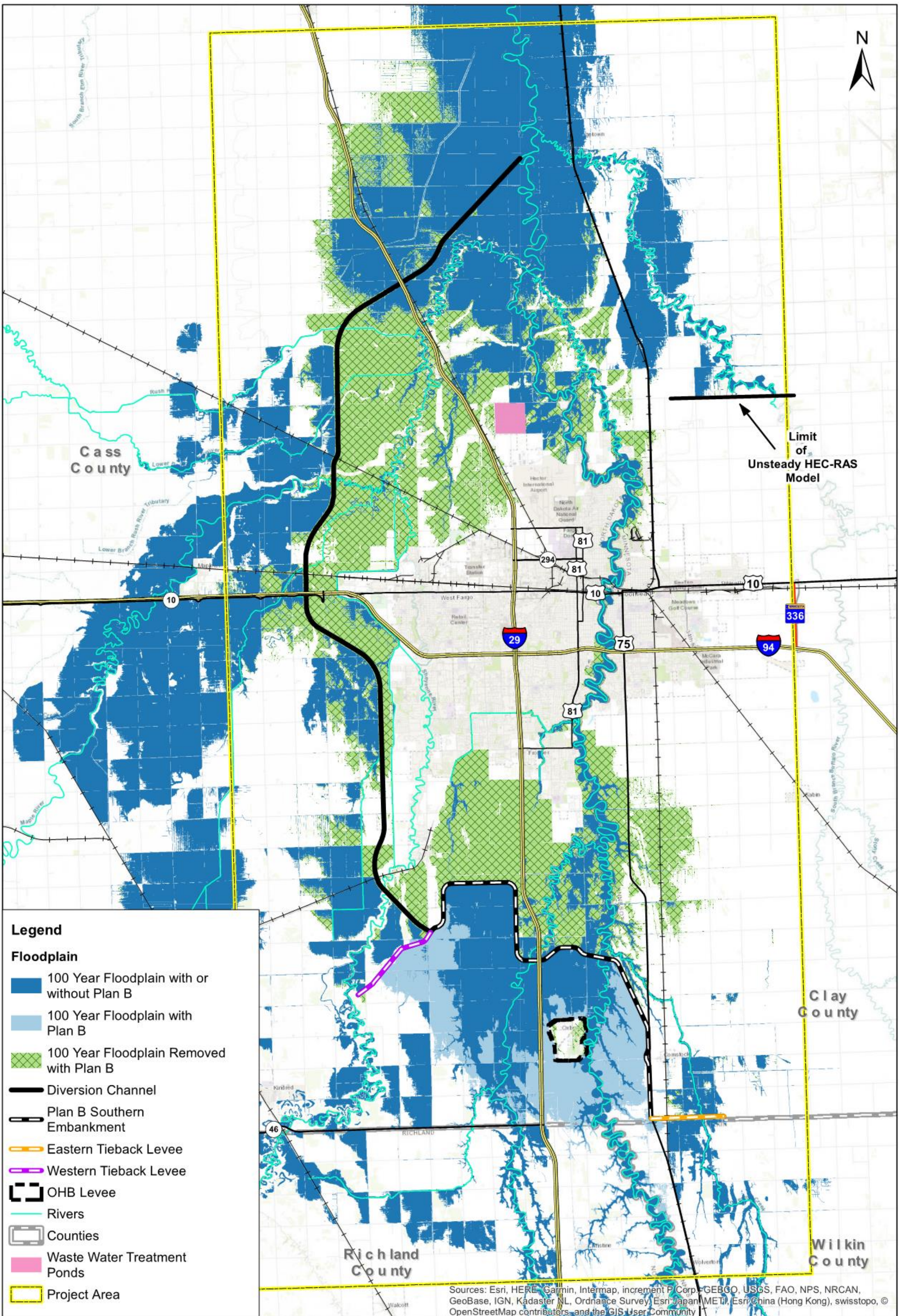


Figure 1

Created By: enelson Date Created: 8/6/2018 Date Exported: 8/15/2018 Elevation Data: -
Horizontal Datum: NAD 1983 StatePlane North Dakota South FIPS 3302 Feet Datum: North American 1983
H:\Fargo\JBN\7400\7438\18_7438_0026\GIS\Maps\PlanB_ProjectComponentMap.mxd



Legend

Floodplain

- 100 Year Floodplain with or without Plan B
- 100 Year Floodplain with Plan B
- 100 Year Floodplain Removed with Plan B
- Diversion Channel
- Plan B Southern Embankment
- Eastern Tieback Levee
- Western Tieback Levee
- OHB Levee
- Rivers
- Counties
- Waste Water Treatment Ponds
- Project Area

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan (METI), Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

**With/Without Plan B 100 Year Event
With Emergency Measures**



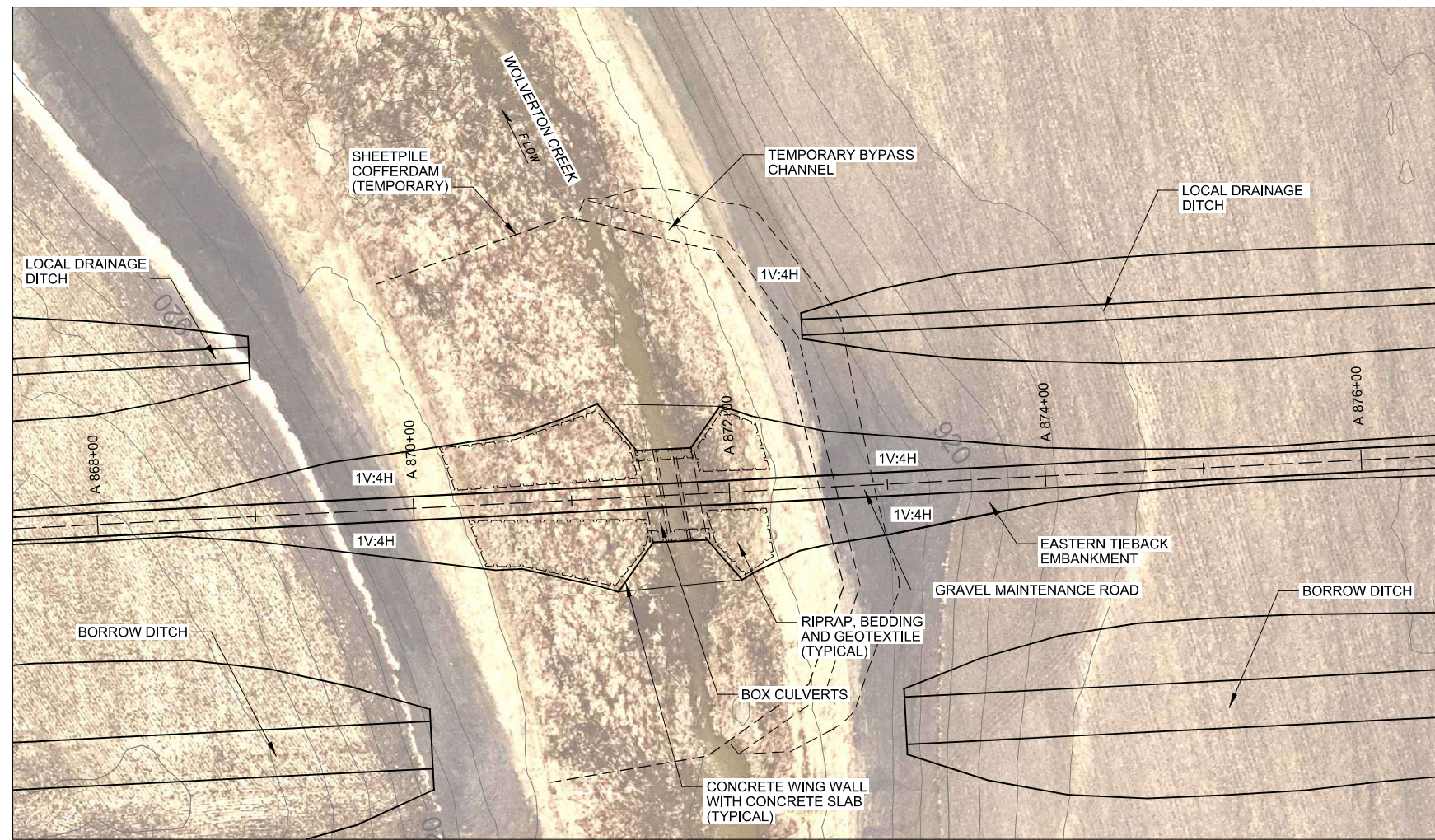
Figure 2

D

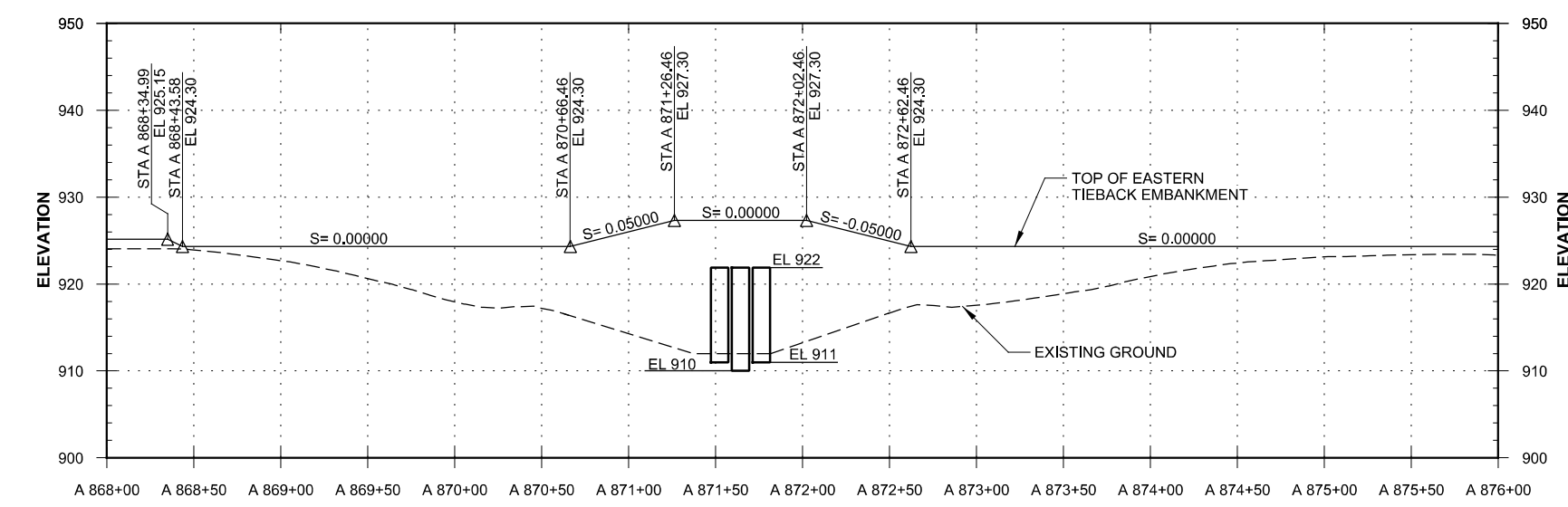
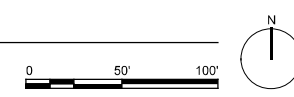
C

B

A



B1 PRELIMINARY PLAN
 EASTERN TIEBACK EMBANKMENT CROSSING
 AT WOLVERTON CREEK
 SCALE: 1"=50'



A1 PRELIMINARY PROFILE
 EASTERN TIEBACK EMBANKMENT CROSSING
 AT WOLVERTON CREEK

PRELIMINARY
 NOT FOR CONSTRUCTION



DATE	APPR.	MARK	DESCRIPTION

DESIGNED BY:	DATE:
DRAWN BY:	SOLICITATION NO.:
CHK BY:	CONTRACT NO.:
SUBMITTED BY:	PLOT DATE:
	FILE NUMBER:
	FILE NAME:
	SIZE:

FMM SOUTHERN EMBANKMENT
 RED RIVER OF THE NORTH RIVER BASIN
 FARGO-MOORHEAD FLOOD RISK MANAGEMENT
 PRELIMINARY PLAN AND PROFILE
 WOLVERTON CREEK CROSSING

SHEET
 IDENTIFICATION
FIGURE 3

1

2

3

4

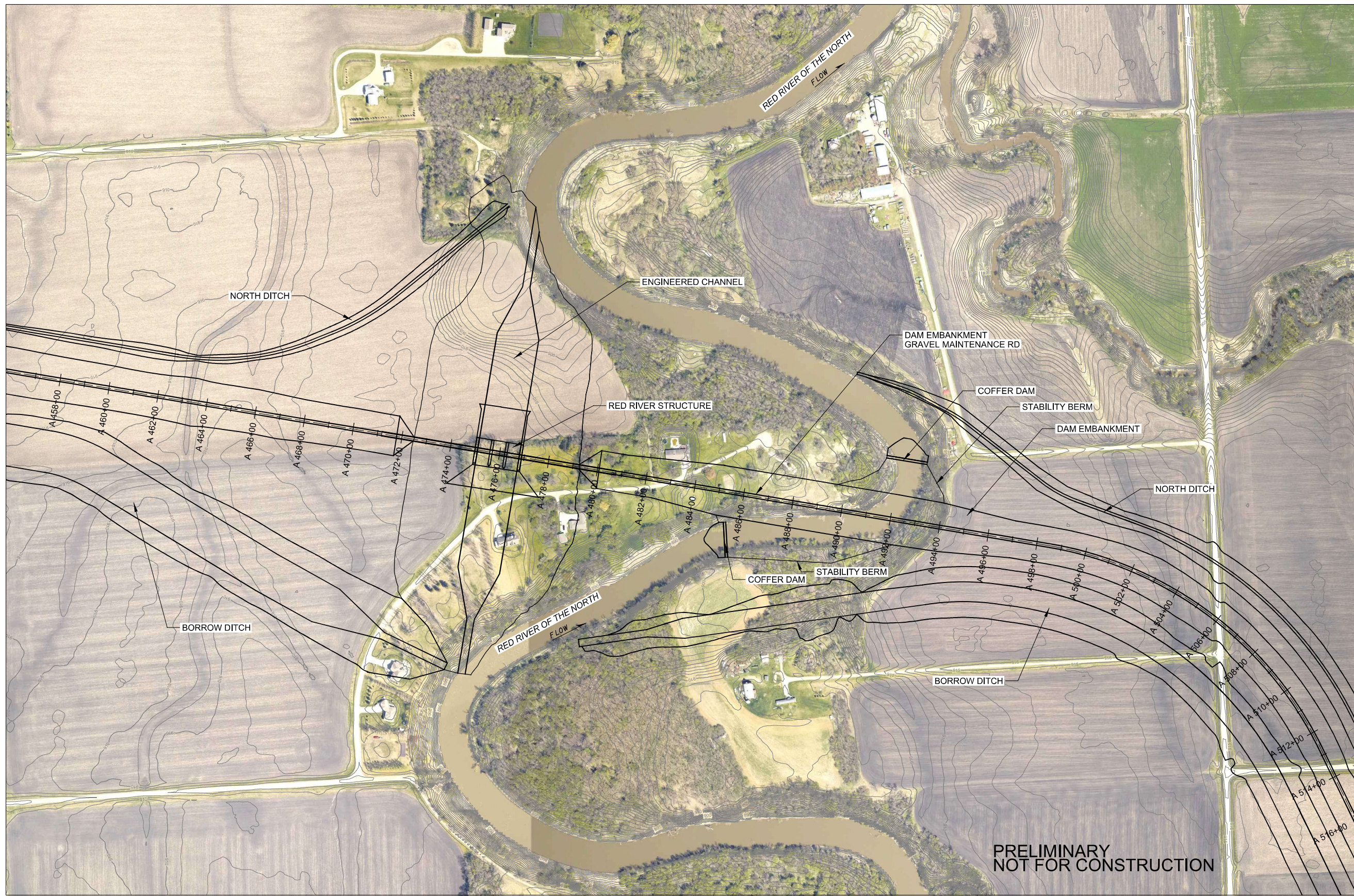
5

D

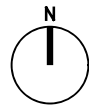
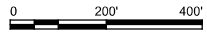
C

B

A



PRELIMINARY
NOT FOR CONSTRUCTION



A1 **PRELIMINARY PLAN**
 RED RIVER STRUCTURE
 SCALE: 1"=200'



US Army Corps of Engineers

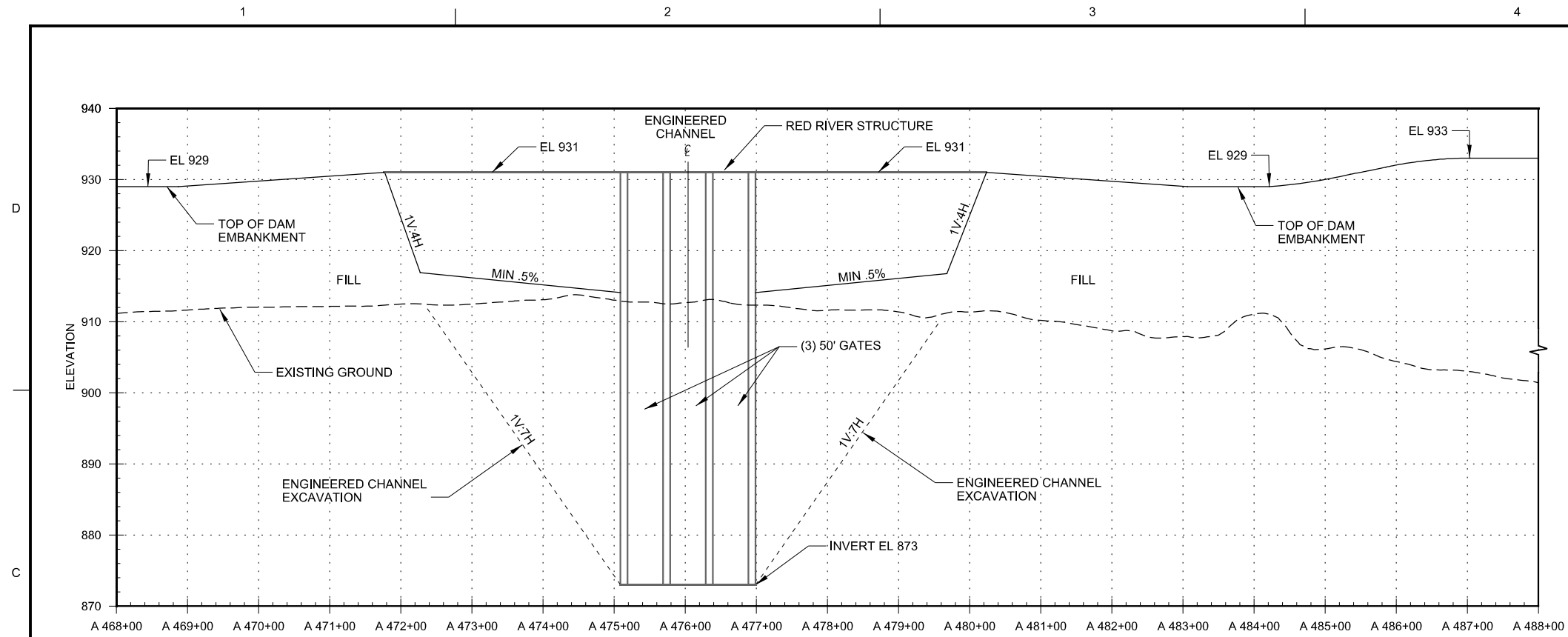
MARK	DESCRIPTION	DATE	APPR.	MARK	DATE	APPR.

FIGURE 4

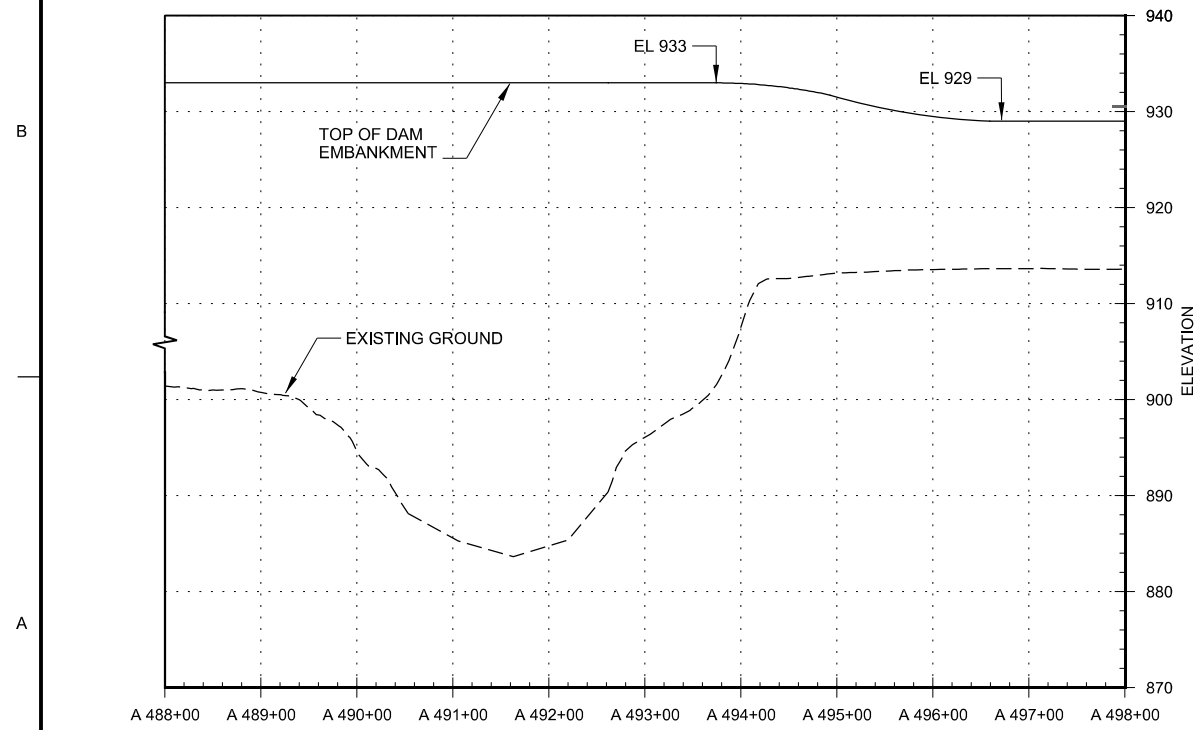
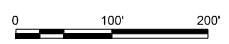
DESIGNED BY:	DATE:	SOLICITATION NO.:
DWN BY:	CHK BY:	CONTRACT NO.:
SUBMITTED BY:	PLOT SCALE:	PLOT DATE:
FILE NAME:	FILE NUMBER:	FILE NUMBER:
SIZE:	FILE NAME:	FILE NUMBER:

FMM SOUTHERN EMBANKMENT
 RED RIVER OF THE NORTH RIVER BASIN
 FARGO-MOORHEAD FLOOD RISK MANAGEMENT
 FARGO, ND
 PRELIMINARY PLAN
 RED RIVER STRUCTURE

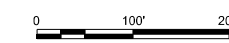
SHEET IDENTIFICATION
 FIGURE 4



A2 PRELIMINARY PROFILE
DAM EMBANKMENT AT RED RIVER STRUCTURE



A1 PROFILE VIEW
DAM EMBANKMENT AT RED RIVER STRUCTURE



PRELIMINARY
NOT FOR CONSTRUCTION



MARK	DATE	APPR.
	DESCRIPTION	MARK
MARK	DATE	APPR.
	DESCRIPTION	MARK

U.S. ARMY CORPS OF ENGINEERS ST. PAUL DISTRICT ST. PAUL, MINNESOTA	DESIGNED BY:	DATE:
	DWN BY:	SOLICITATION NO.:
FMM SOUTHERN EMBANKMENT RED RIVER OF THE NORTH RIVER BASIN FARGO-MOORHEAD FLOOD RISK MANAGEMENT FARGO, ND	SUBMITTED BY:	CONTRACT NO.:
	FILE NAME: FMMFMR_RRS_PERMIT_C-PR-1.dgn	FILE NUMBER:
PRELIMINARY PROFILE DAM EMBANKMENT RED RIVER STRUCTURE	SIZE:	PLOT DATE:
	1" = 100'	8/8/2018

U.S. ARMY CORPS OF ENGINEERS ST. PAUL DISTRICT ST. PAUL, MINNESOTA
--

SHEET
IDENTIFICATION
FIGURE 5

A B C D

1

2

3

4

5



A1 PRELIMINARY PLAN
WILD RICE RIVER STRUCTURE

**PRELIMINARY
NOT FOR CONSTRUCTION**

ELEVATION DATUM (VERTICAL CONTROL): COORDINATE SYSTEM (HORIZONTAL CONTROL):
 NAVD 88 NAD 83 (2011)
 GEOID12A ND SPCS, SOUTH ZONE-U.S. SURVEY FT.
 COMBINED FACTOR (CF): 0.999956276

FMM WILD RICE RIVER STRUCTURE
 RED RIVER OF THE NORTH RIVER BASIN
 FARGO-MOORHEAD FLOOD RISK MANAGEMENT
 FARGO, ND
 PRELIMINARY PLAN
 WILD RICE RIVER STRUCTURE

Sheet ID
FIGURE 6

DESIGNED BY: U.S. ARMY CORPS OF ENGINEERS
 DRAWN BY: EPP
 SUBMITTED BY: THOMAS SULLY
 PLOT SCALE: 1" = 200'
 PLOT DATE: 8/8/2018
 FILE NUMBER: XXX
 FILE NAME: FMMWRCS_G-101r.dgn

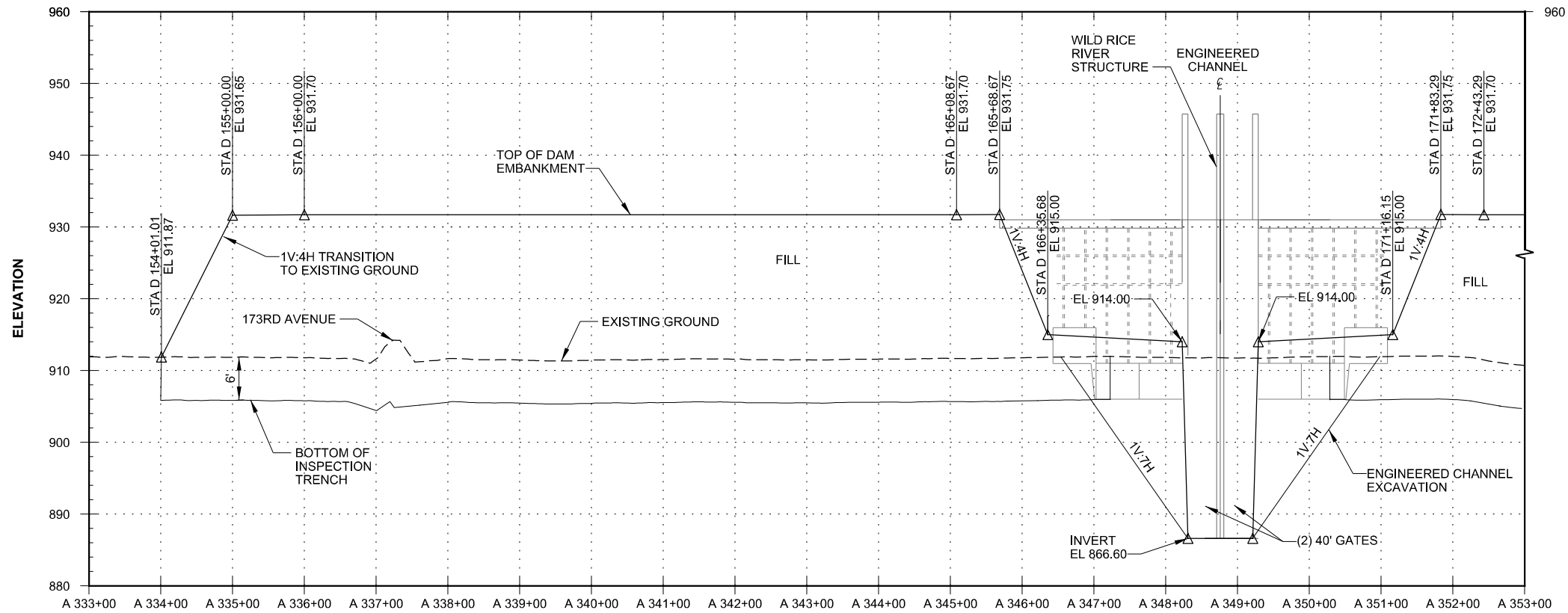
DATE: SOLICITATION NO.:
 APPR. MARK: CONTRACT NO.:
 DATE: DESCRIPTION: FILE NUMBER: XXX

US Army Corps of Engineers

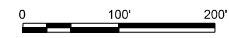
FIGURE 6

D

C

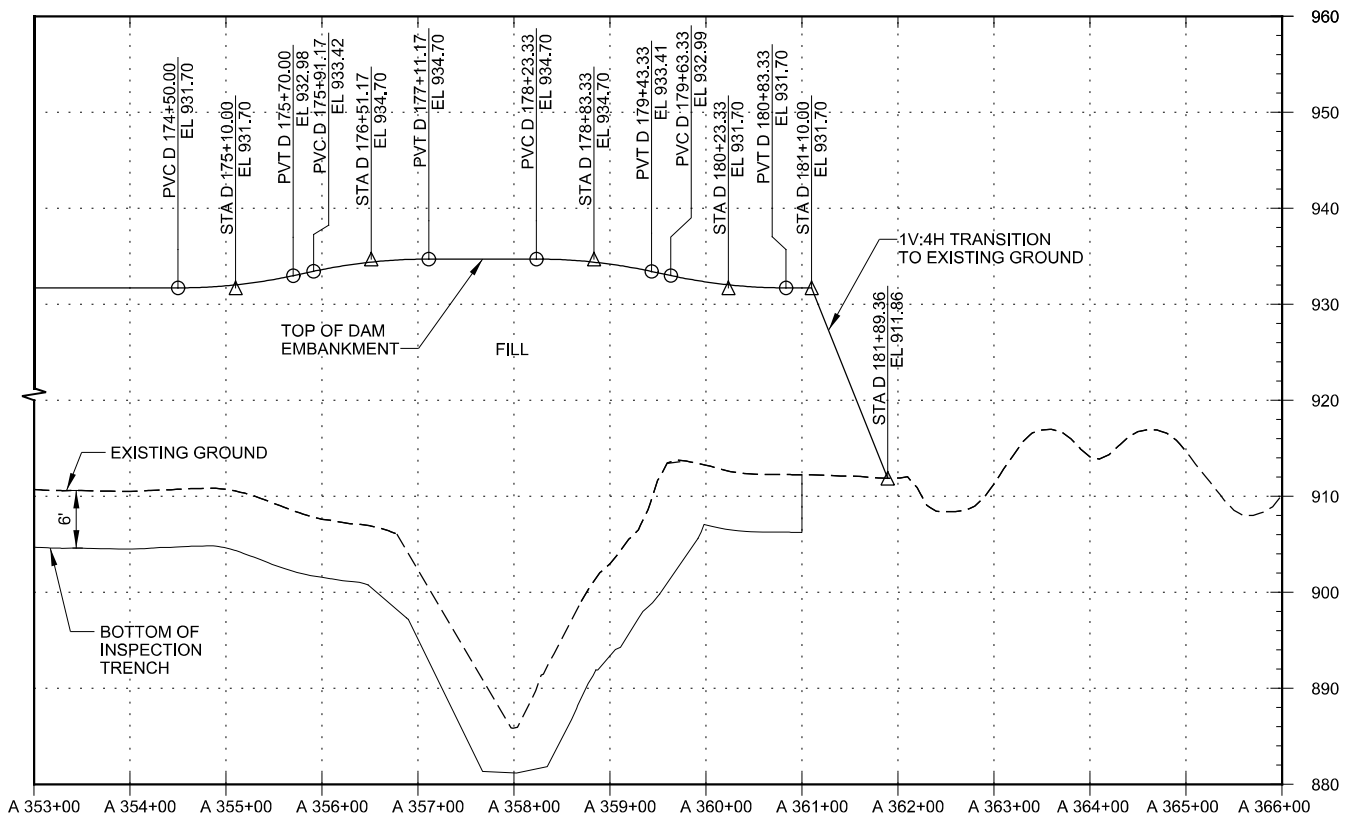


A2 PRELIMINARY PROFILE
DAM EMBANKMENT AT WILD RICE RIVER STRUCTURE

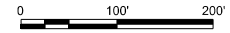


B

A



A1 PRELIMINARY PROFILE
DAM EMBANKMENT AT WILD RICE RIVER STRUCTURE



PRELIMINARY
NOT FOR CONSTRUCTION

ELEVATION DATUM (VERTICAL CONTROL): COORDINATE SYSTEM (HORIZONTAL CONTROL):
 NAVD 88 NAD 83 (2011)
 GEOD12A ND SPCS, SOUTH ZONE-U.S. SURVEY FT.
 COMBINED FACTOR (CF): 0.999956276



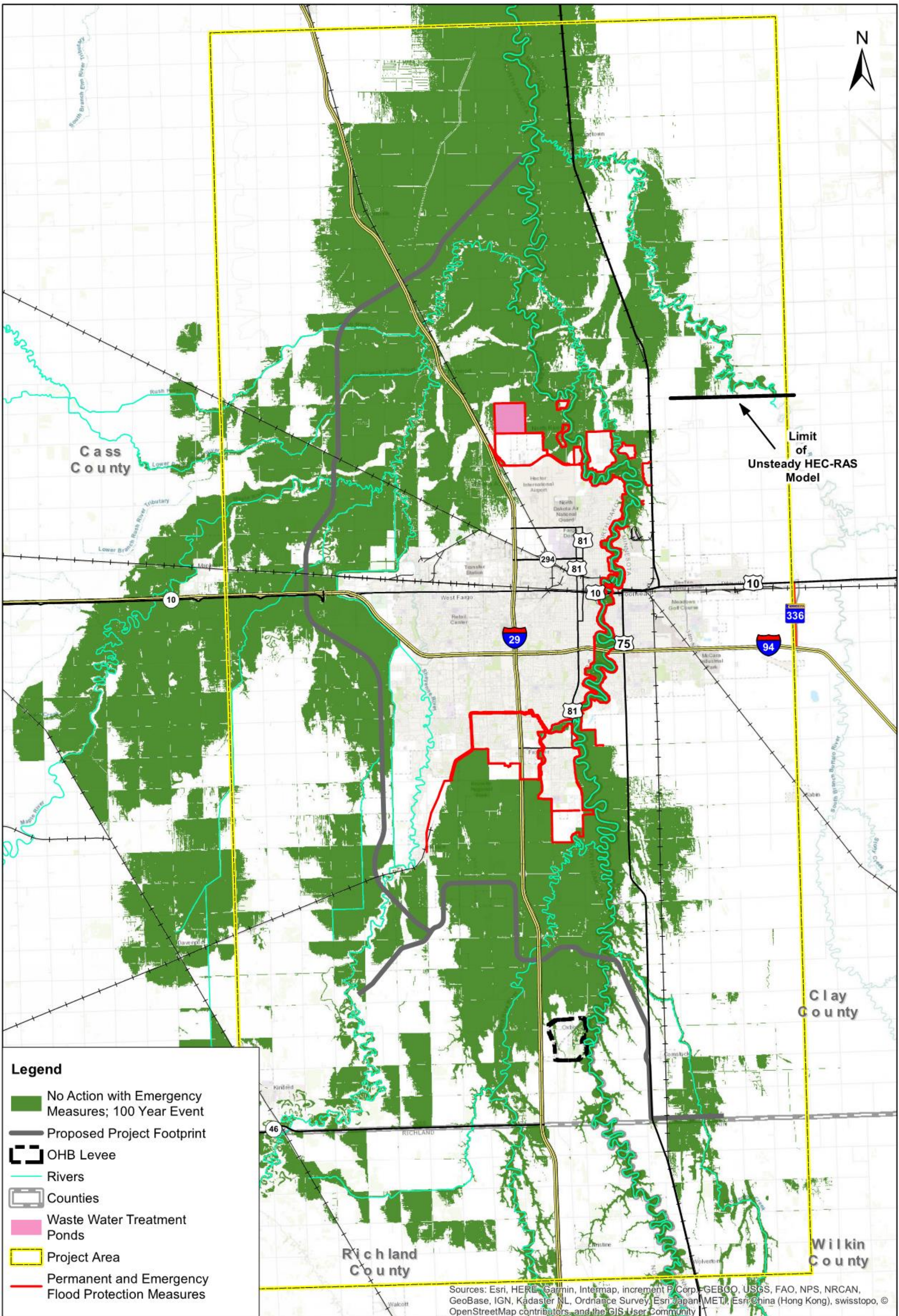
MARK	DESCRIPTION	DATE	APPR.	MARK	DATE	APPR.

DESIGNED BY: EPP	CHECKED BY: GCW	SUBMITTED BY: THOMAS SULLY	DATE: 8/8/2018	DESIGNATION NO.:	CONTRACT NO.:	FILE NUMBER:
U.S. ARMY CORPS OF ENGINEERS ST. PAUL DISTRICT ST. PAUL, MINNESOTA			FILE NAME: FMMWRCS_C52011-4.dgn			

FMM WILD RICE RIVER STRUCTURE
 RED RIVER OF THE NORTH RIVER BASIN
 FARGO-MOORHEAD FLOOD RISK MANAGEMENT
 FARGO, ND
 PRELIMINARY PROFILE
 DAM EMBANKMENT
 WILD RICE RIVER STRUCTURE

Sheet ID
FIGURE 7

FIGURE 7



Legend

- No Action with Emergency Measures; 100 Year Event
- Proposed Project Footprint
- OHB Levee
- Rivers
- Counties
- Waste Water Treatment Ponds
- Project Area
- Permanent and Emergency Flood Protection Measures

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan (METI), Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

Base No Action (with Emergency Measures); 100 Year Event

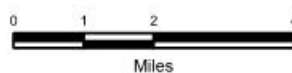
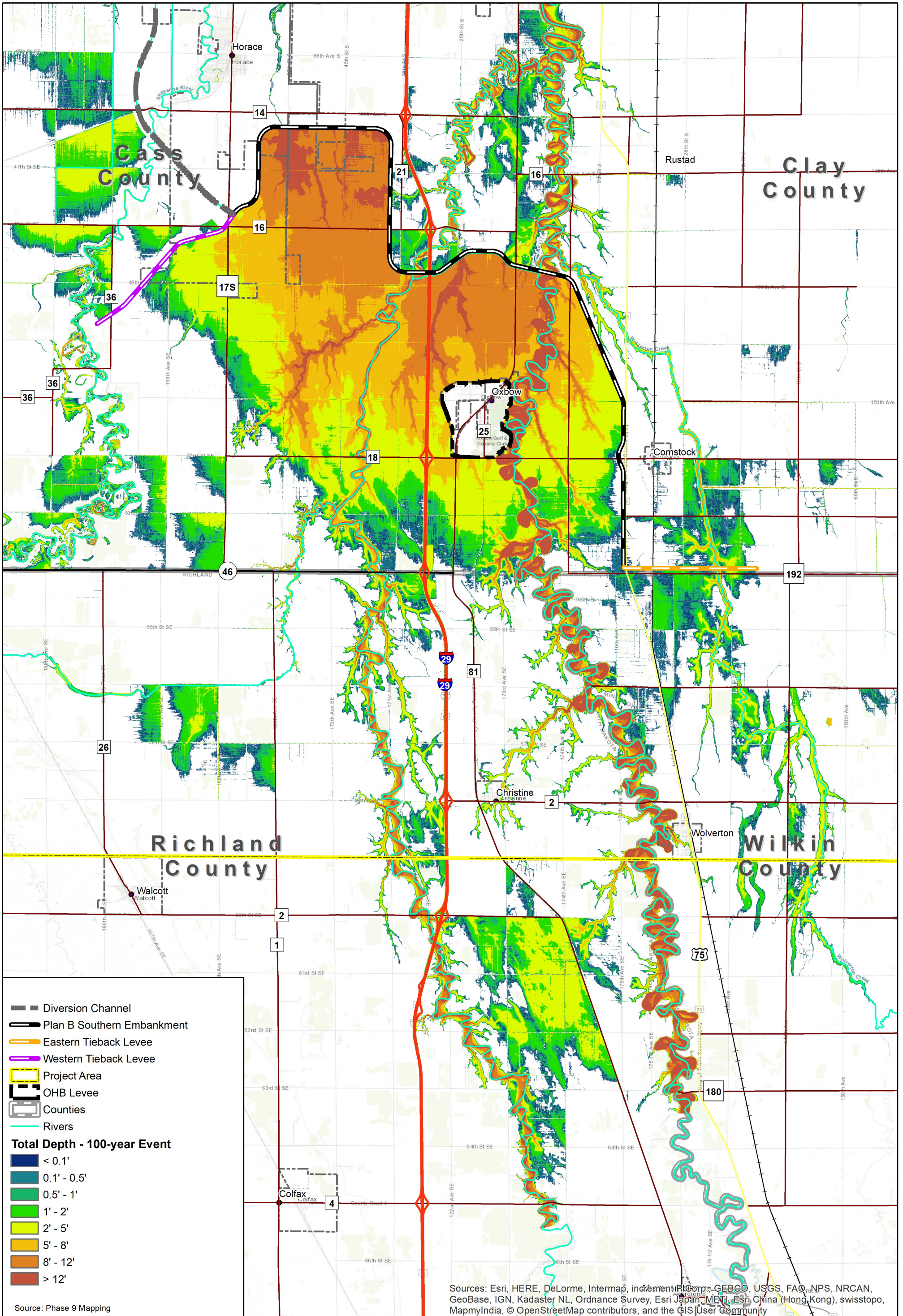


Figure 8



**Plan B – 100-year Event
Total Depth Map**

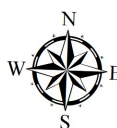
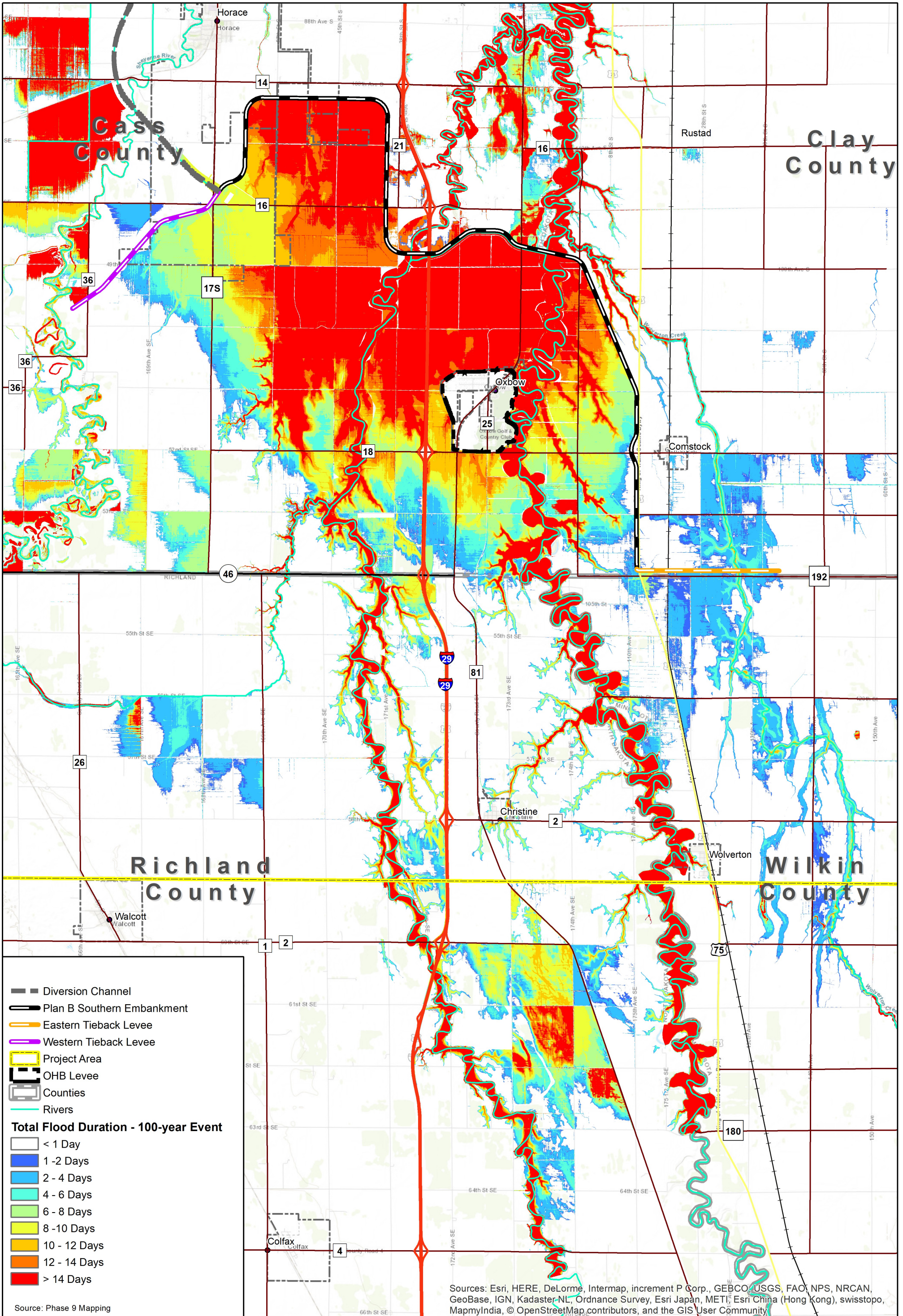


Figure 9



**Plan B – 100-year Event
Total Duration Map**

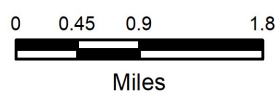
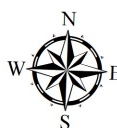
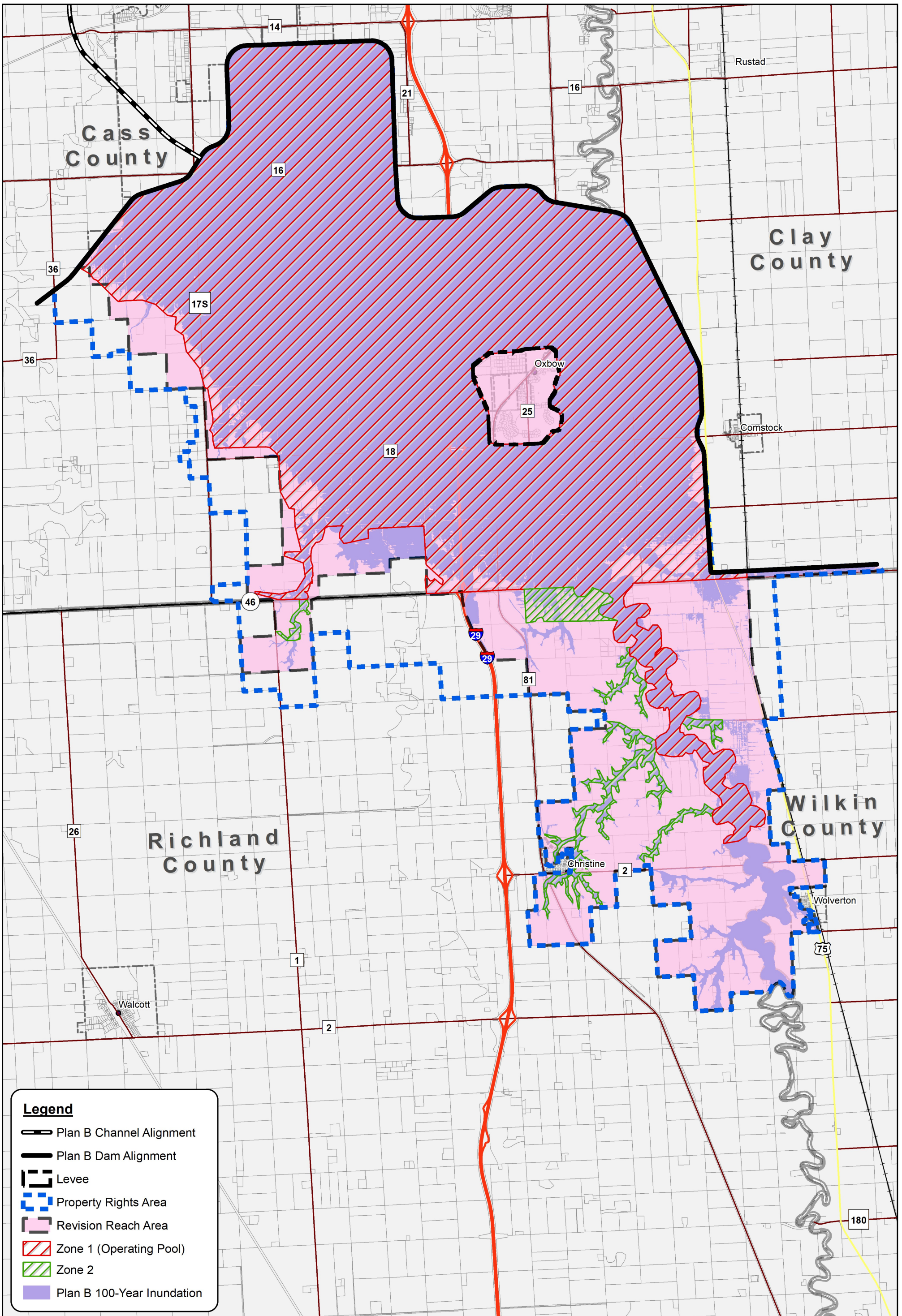


Figure 10



Legend

- Plan B Channel Alignment
- Plan B Dam Alignment
- Levee
- Property Rights Area
- Revision Reach Area
- Zone 1 (Operating Pool)
- Zone 2
- Plan B 100-Year Inundation

**FM AREA DIVERSION PROJECT
UPSTREAM MITIGATION AREA**

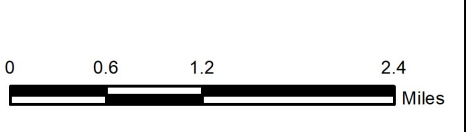
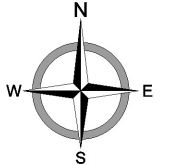
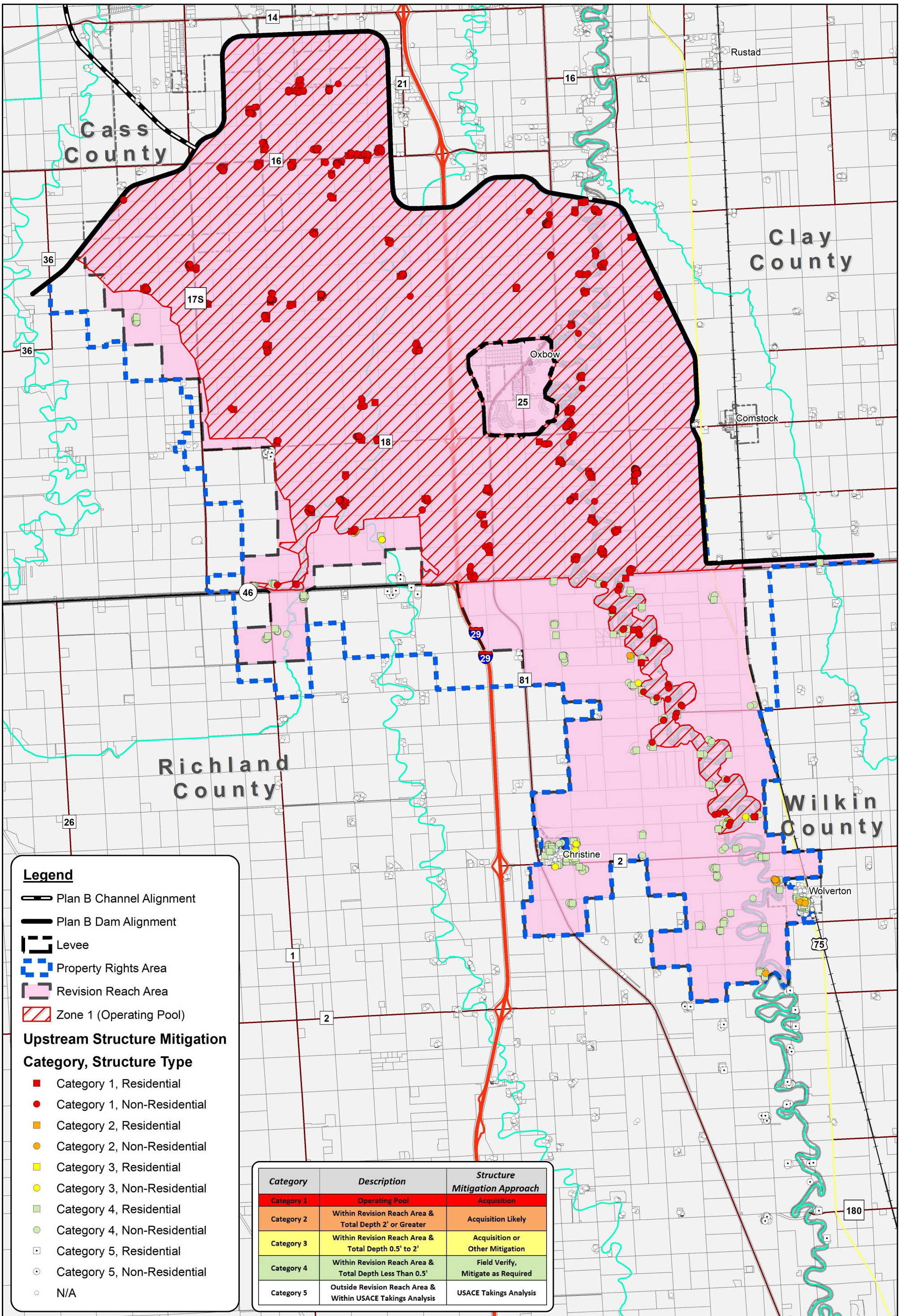


FIGURE 11



Created By: KMW Date Created: 08/18/18 Date Saved: 08/08/18 Date Exported: 08/08/18
 Plotted By: Kyle Volk Parcel Date: Varies Aerial Image: N/A Elevation Data: 2008 Lidar
 Horizontal Datum: NAD 1983 StatePlane North Dakota South FIPS 3302 Feet Vertical Datum: NAVD1988
 T:\Projects\17700\17738\211\WMDNR_ADA_Maps\19116_Upstream_Mitigation_Area_Plan_B_2018_07_24_Figure11.mxd



Legend

- Plan B Channel Alignment
- Plan B Dam Alignment
- Levee
- Property Rights Area
- Revision Reach Area
- Zone 1 (Operating Pool)

Upstream Structure Mitigation Category, Structure Type

- Category 1, Residential
- Category 1, Non-Residential
- Category 2, Residential
- Category 2, Non-Residential
- Category 3, Residential
- Category 3, Non-Residential
- Category 4, Residential
- Category 4, Non-Residential
- Category 5, Residential
- Category 5, Non-Residential
- N/A

Category	Description	Structure Mitigation Approach
Category 1	Operating Pool	Acquisition
Category 2	Within Revision Reach Area & Total Depth 2' or Greater	Acquisition Likely
Category 3	Within Revision Reach Area & Total Depth 0.5' to 2'	Acquisition or Other Mitigation
Category 4	Within Revision Reach Area & Total Depth Less Than 0.5'	Field Verify, Mitigate as Required
Category 5	Outside Revision Reach Area & Within USACE Takings Analysis	USACE Takings Analysis

**FM AREA DIVERSION PROJECT
POTENTIALLY IMPACTED STRUCTURES**

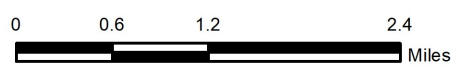
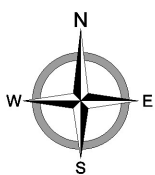
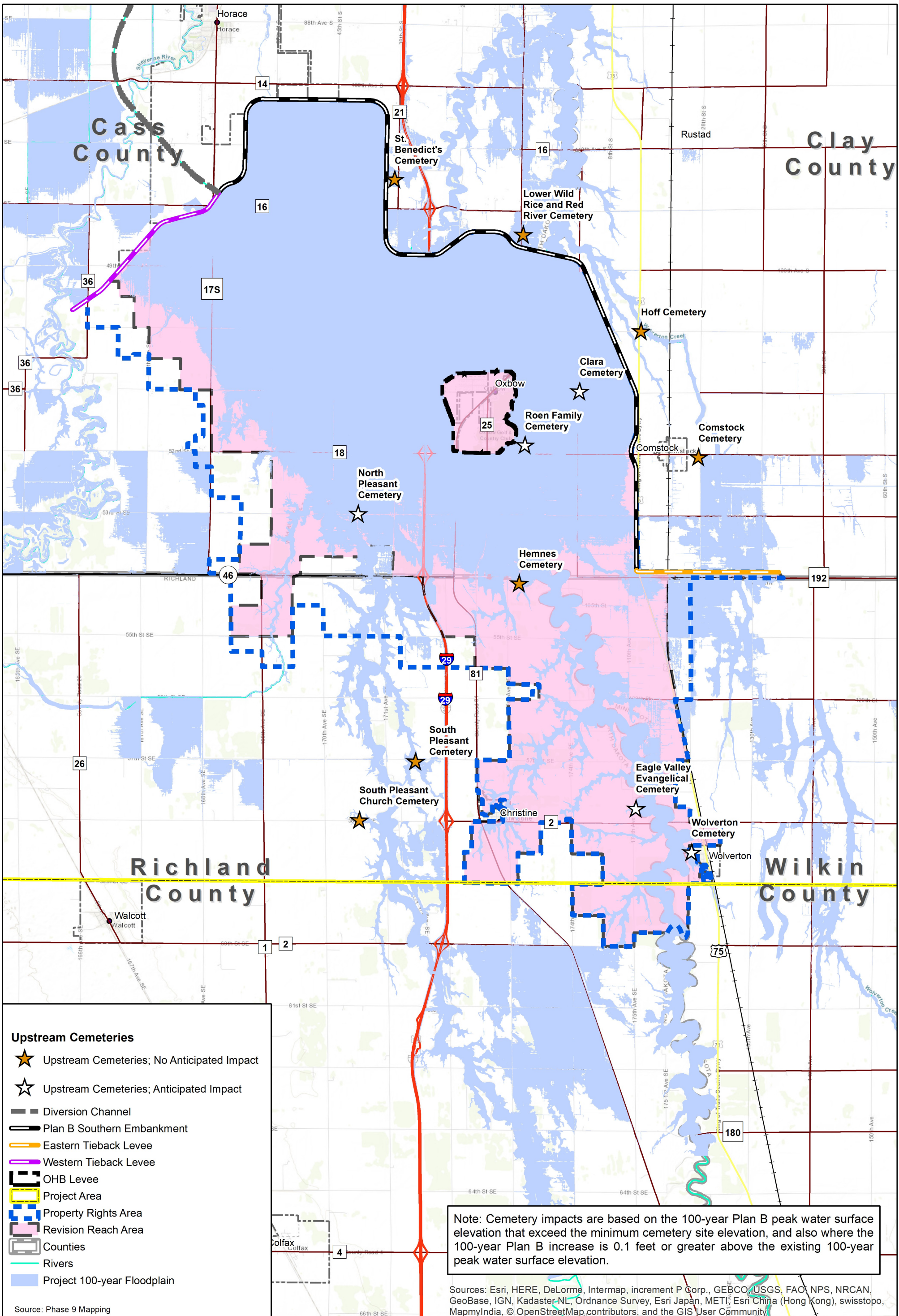


FIGURE 12



Created By: KMW Date Created: 08/18/18 Date Saved: 08/08/18 Date Exported: 08/08/18
 Plotted By: Kyle Volk Parcel Date: Varies Aerial Image: N/A Elevation Data: 2008 Lidar
 Horizontal Datum: NAD 1983 StatePlane North Dakota South FIPS 3302 Feet Vertical Datum: NAVD1988
 T:\Projects\17700\17738\211\MDNR_ADA_Maps\19116_Structure_Mitigation_Plan_B_Update_2018_07_24_Figure12.mxd



**Upstream Cemeteries;
Plan B 100-year Event;
Property Rights Areas**

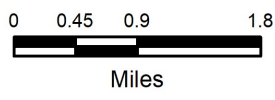
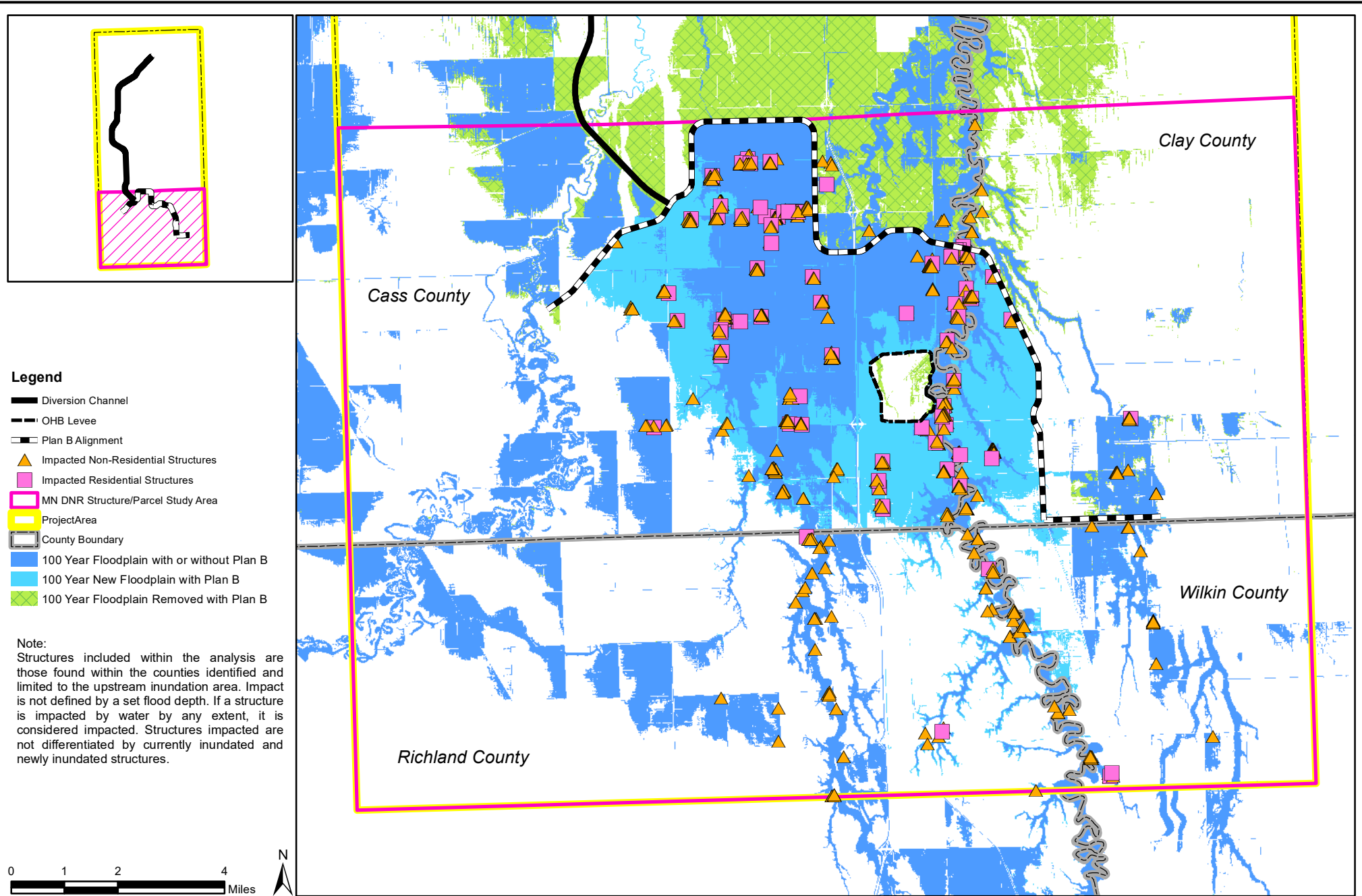


Figure 13



- Legend**
- Diversion Channel
 - OHB Levee
 - Plan B Alignment
 - ▲ Impacted Non-Residential Structures
 - Impacted Residential Structures
 - MN DNR Structure/Parcel Study Area
 - ▭ Project Area
 - County Boundary
 - 100 Year Floodplain with or without Plan B
 - 100 Year New Floodplain with Plan B
 - 100 Year Floodplain Removed with Plan B

Note:
 Structures included within the analysis are those found within the counties identified and limited to the upstream inundation area. Impact is not defined by a set flood depth. If a structure is impacted by water by any extent, it is considered impacted. Structures impacted are not differentiated by currently inundated and newly inundated structures.



FARGO-MOORHEAD FLOOD RISK MANAGEMENT PROJECT

Plan B Impacted Structures, Upstream Inundation Area, 100-year Flood

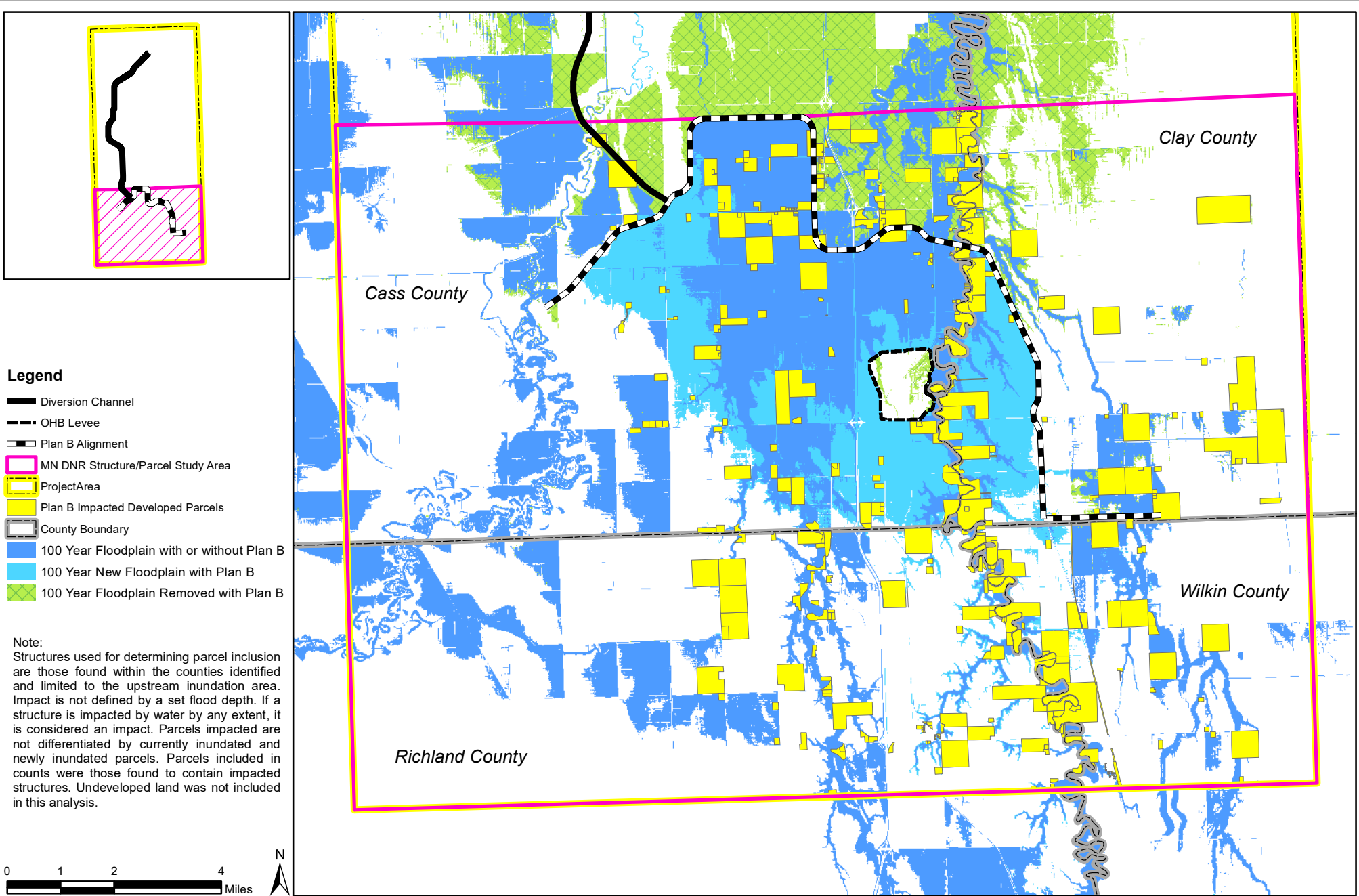
Created by: Forward K. Date Created: 08/09/2018 Exported Date: 08/09/2018



Figure 14

Source: Phase9_Polygons_Updates.gdb, ExCond_CombRPTP_FP_100yr, WP_CombRPTP_FP_100yr, MN_DNR_100YR_PlanB_Structures_Merged.shp

Coordinate System: NAD 1983 UTM Zone 14N



FARGO-MOORHEAD FLOOD RISK MANAGEMENT PROJECT

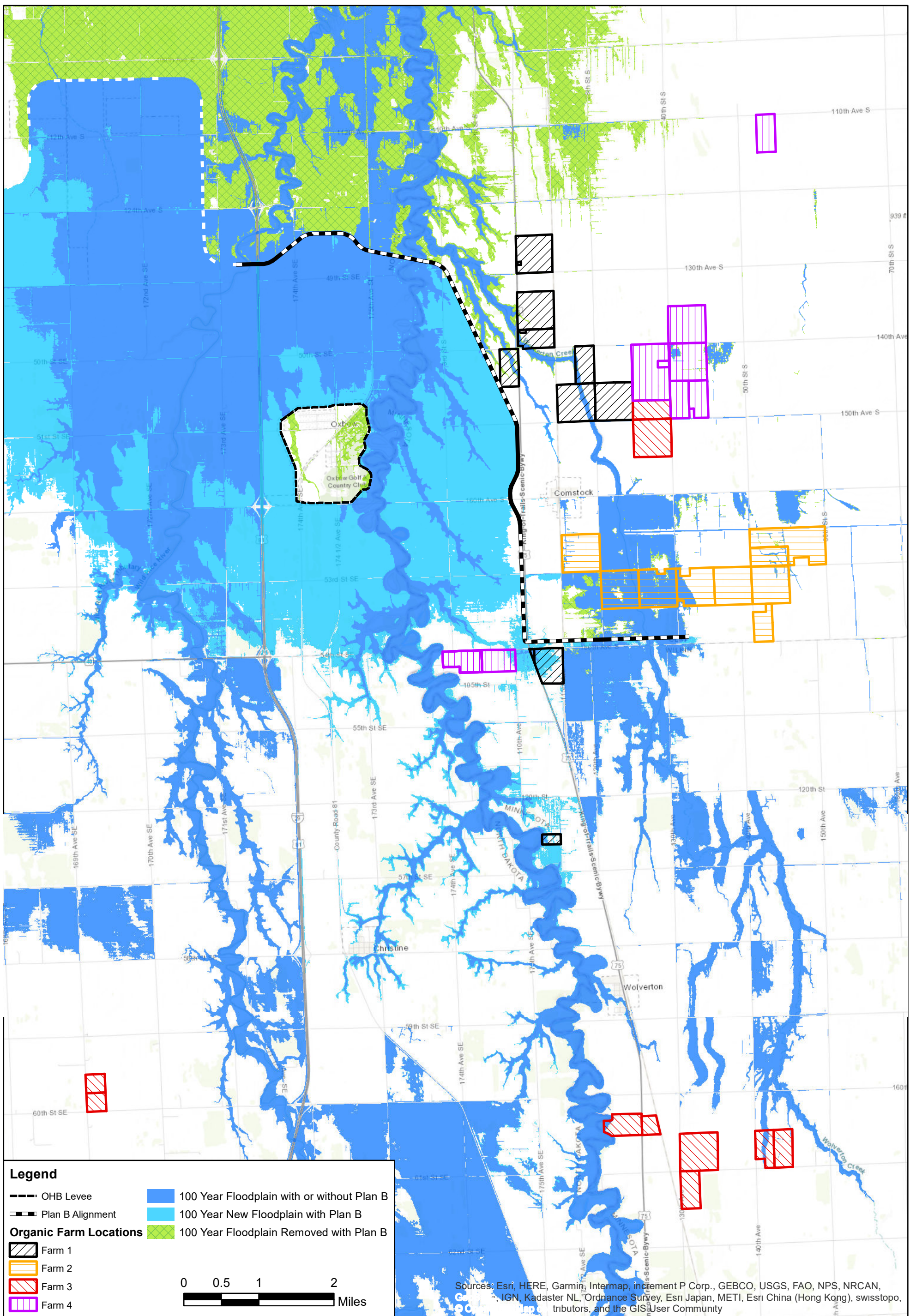
Plan B Impacted Parcels, Upstream Inundation Area, 100-year Flood

Created by: Forward K. Date Created: 08/09/2018 Exported Date: 08/09/2018



Figure 15

Source: Phase9_Polygons_Updates.gdb, ExCond_CombRPTP_FP_100yr, WP_CombRPTP_FP_100yr, RichlandParcels_100YR_PlanB, CassParcels_100YR_PlanB, WilkinParcels_100YR_PlanB, ClayParcels_100YR_PlanB.



FARGO-MOORHEAD FLOOD RISK MANAGEMENT PROJECT

Plan B Impacted Organic Farms, 100-year Flood

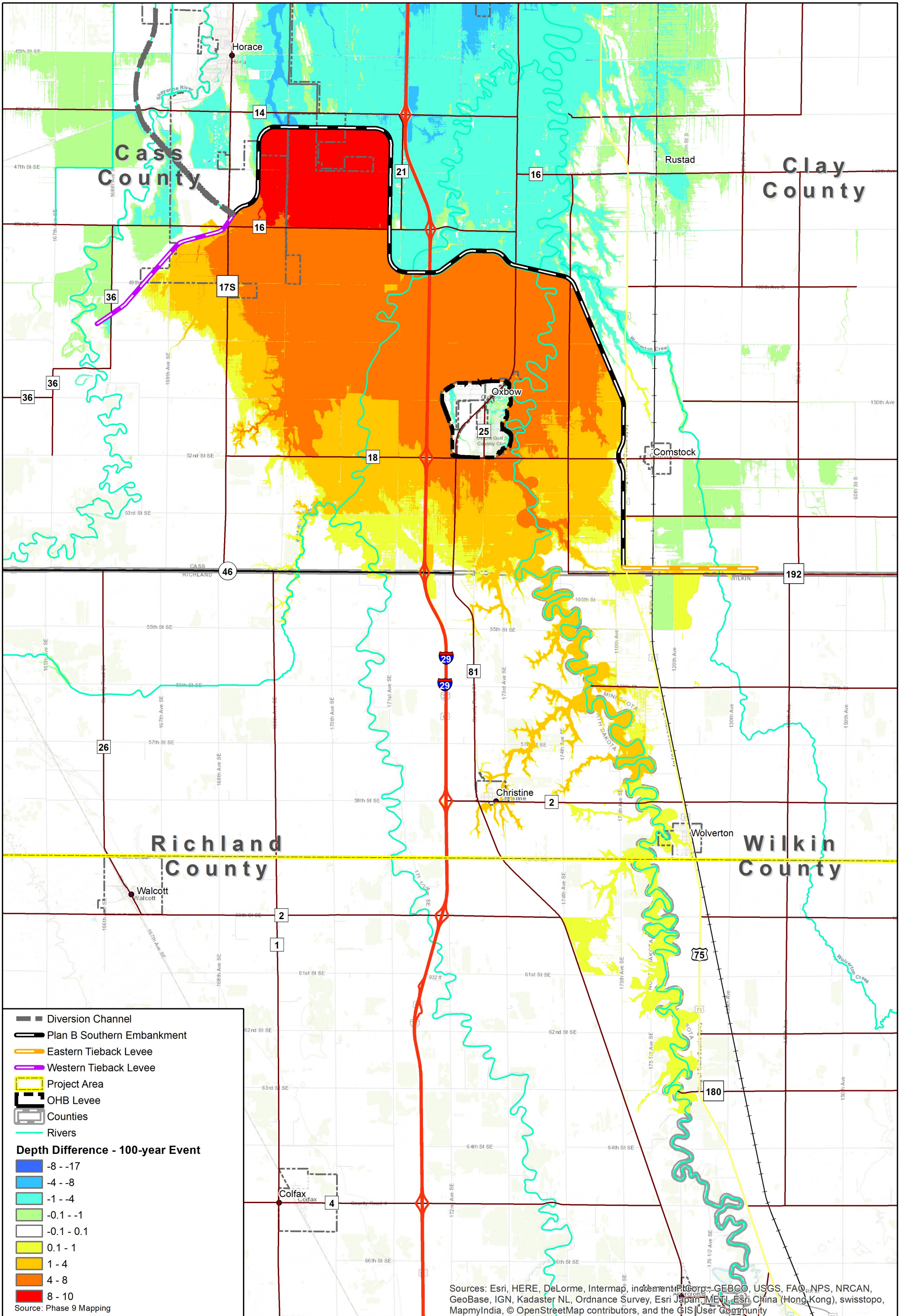
Created by: Forward K. Date Created: 08/09/2018 Exported Date: 08/09/2018



Figure 16

Source: Phase9_Polygons_Updates.gdb, ExCond_CombRPTP_FP_100yr, WP_CombRPTP_FP_100yr, Organic_Farm_Locations.shp

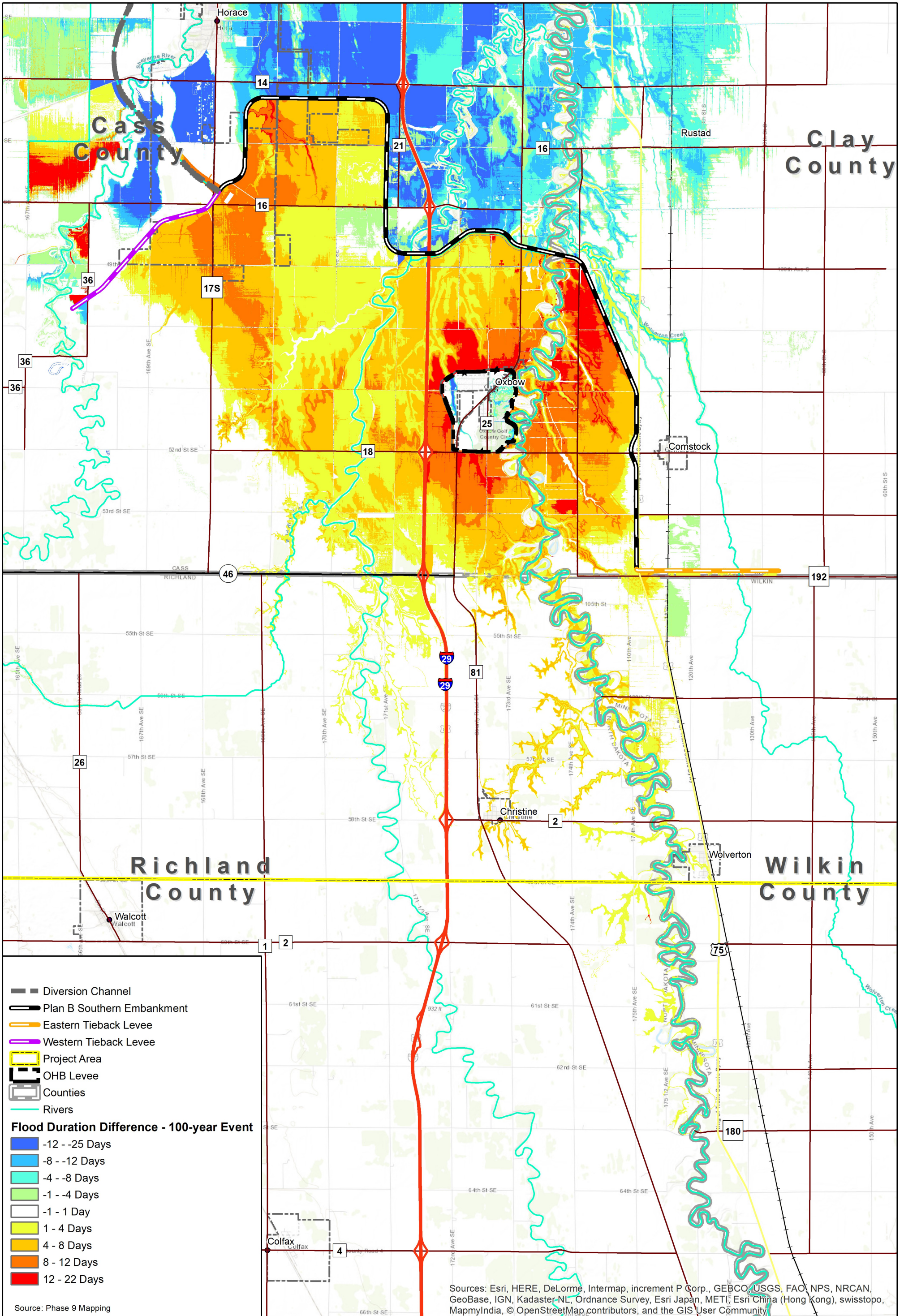
Coordinate System: NAD 1983 UTM Zone 14N



**Plan B – 100-year Event
Depth Difference Map**



Figure 17



**Plan B – 100-year Event
Duration Difference Map**

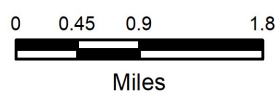
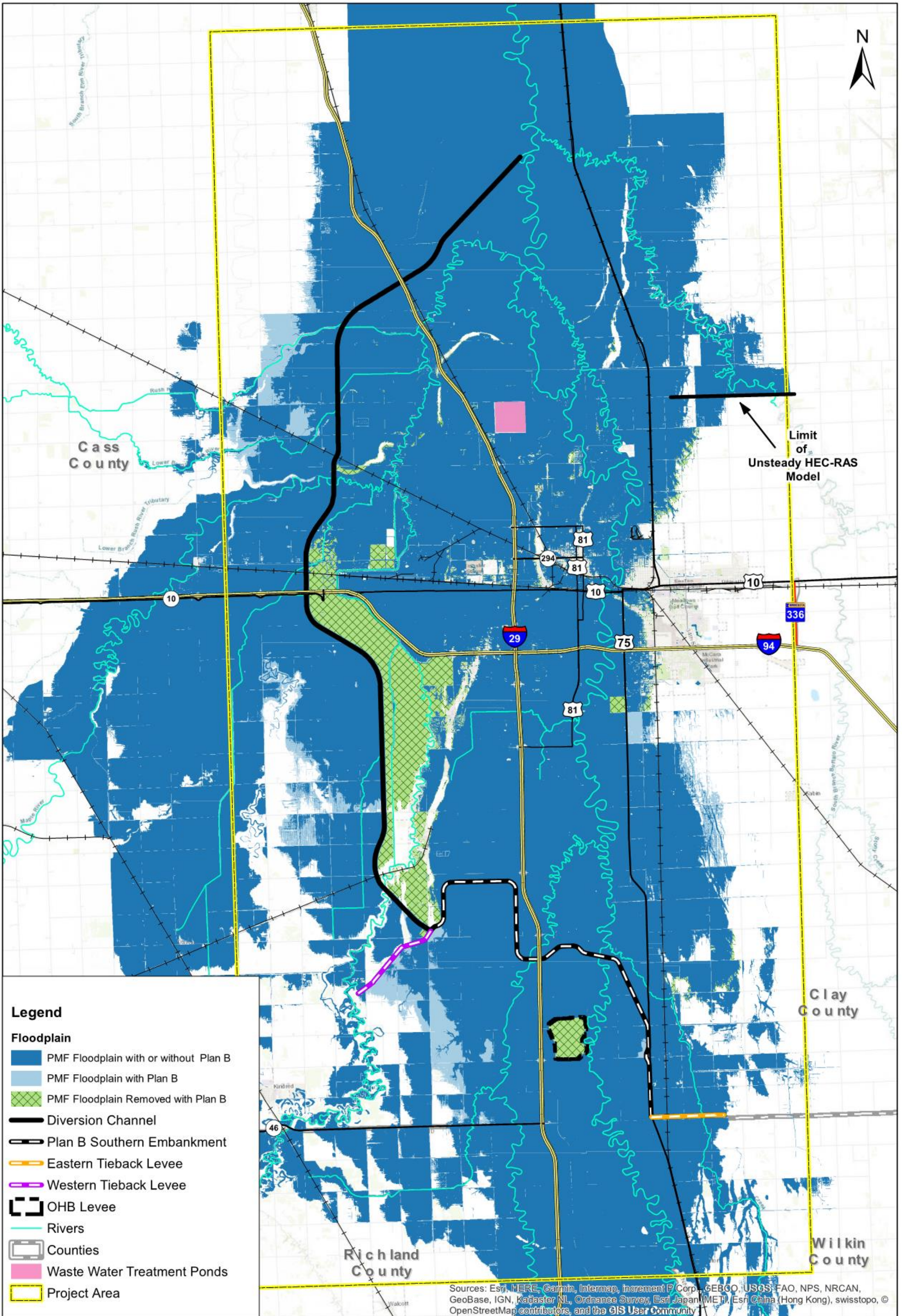


Figure 18



Legend

Floodplain

- PMF Floodplain with or without Plan B
- PMF Floodplain with Plan B
- PMF Floodplain Removed with Plan B
- Diversion Channel
- Plan B Southern Embankment
- Eastern Tieback Levee
- Western Tieback Levee
- OHB Levee
- Rivers
- Counties
- Waste Water Treatment Ponds
- Project Area

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan (METI), Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

Plan B PMF Floodplain



Figure 19