Overview of Diversion Authority's Locally Preferred Plan and Plan B Working Group

Presentation to:
Fargo-Moorhead Area Flood Diversion Task Force
October 23, 2017

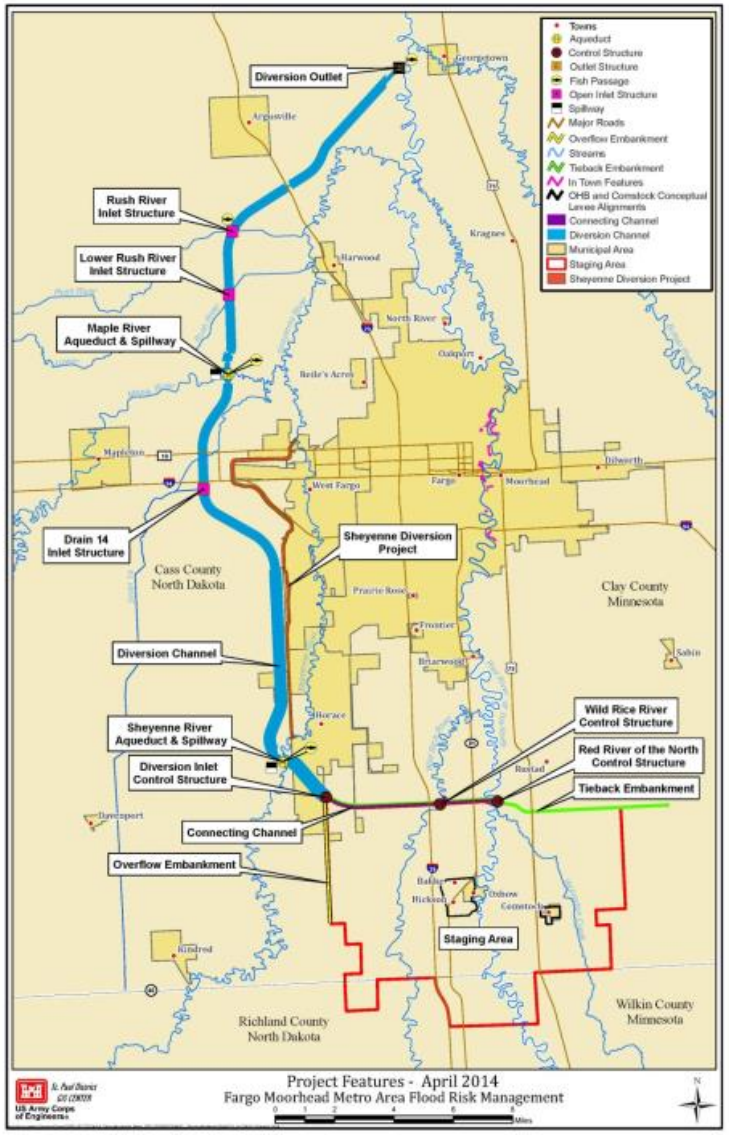
Presentation Outline

- Overview of the Federal Project, Locally Preferred Plan (LPP)
  - Highlights of Project Features
  - Project Operation
  - Mitigation Efforts

Overview of the Federal Project

Diversion Project's Three Primary Features

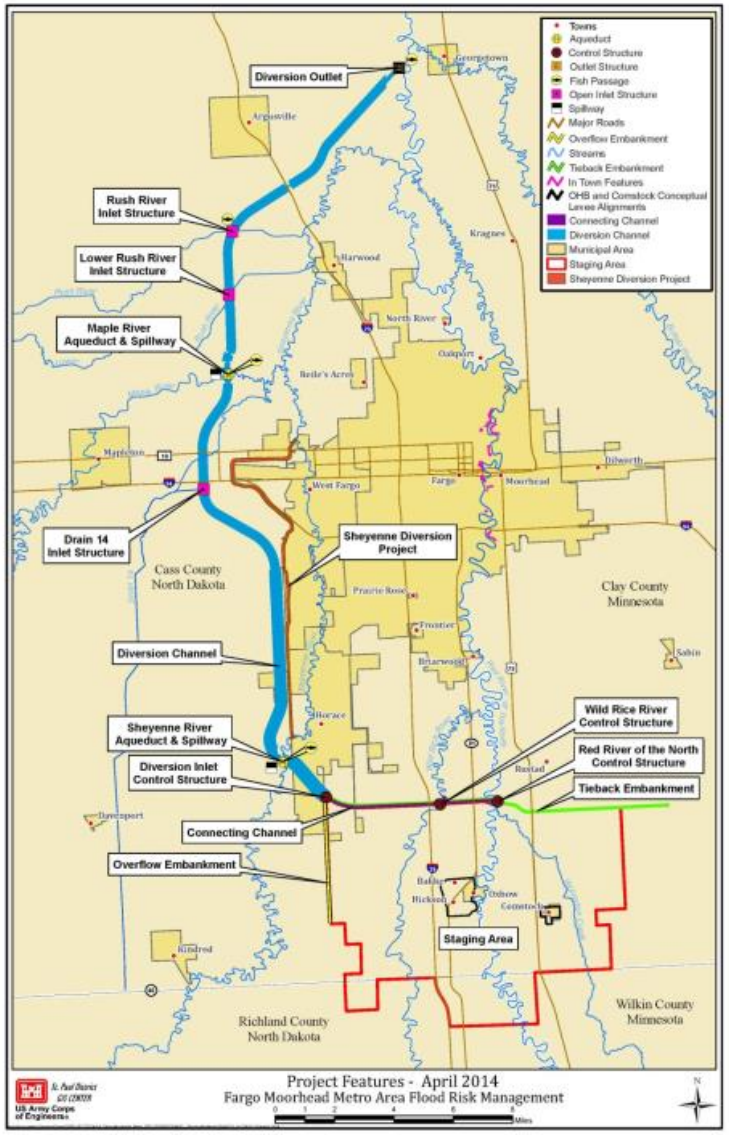
- Diversion Channel
- Upstream Storage / Embankment
- In-Town Levees



Diversion Channel

30-mile Diversion Channel

- 1,600 ft wide
- Outlet near Georgetown, MN
- Inlet SE of Horace, ND

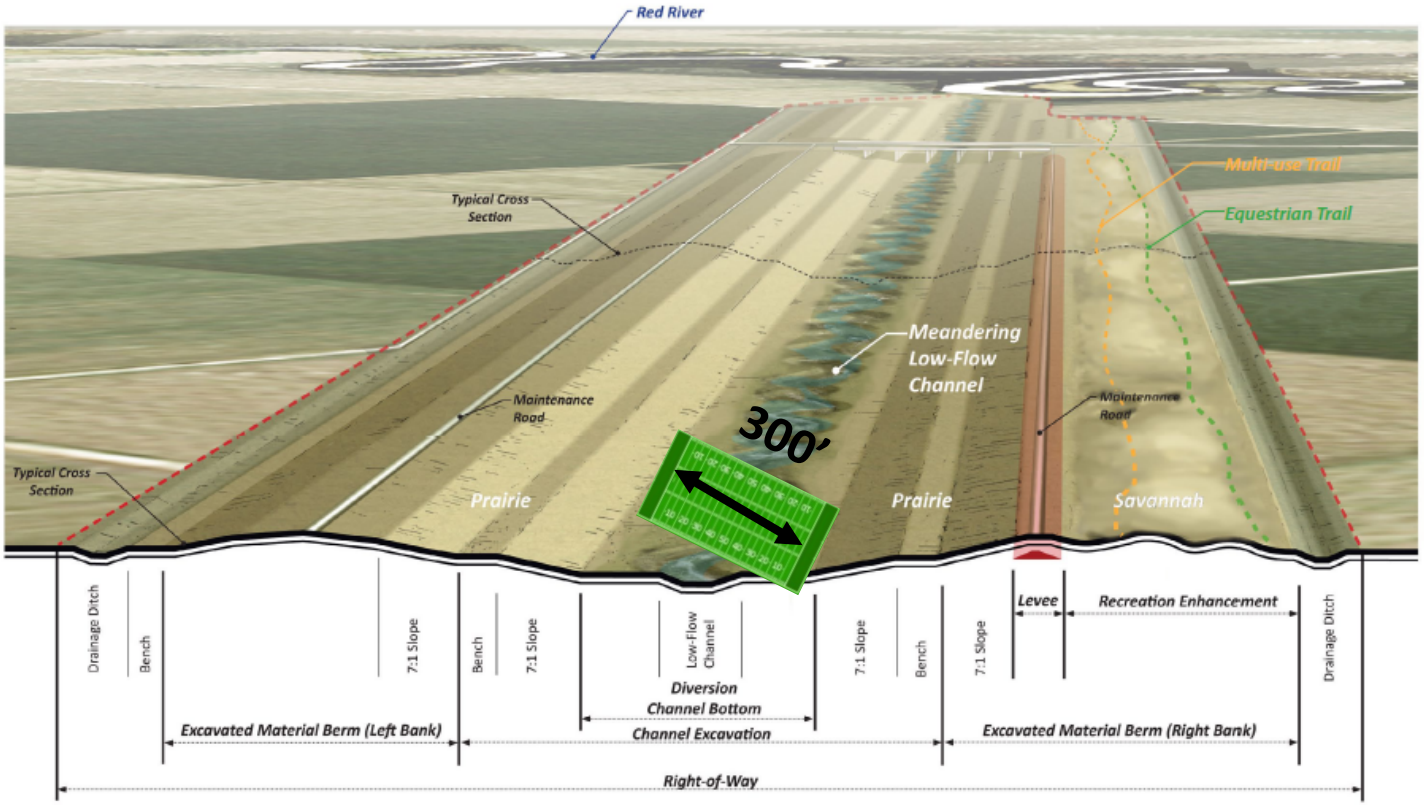


Permanent Acquisition Needs for Construction

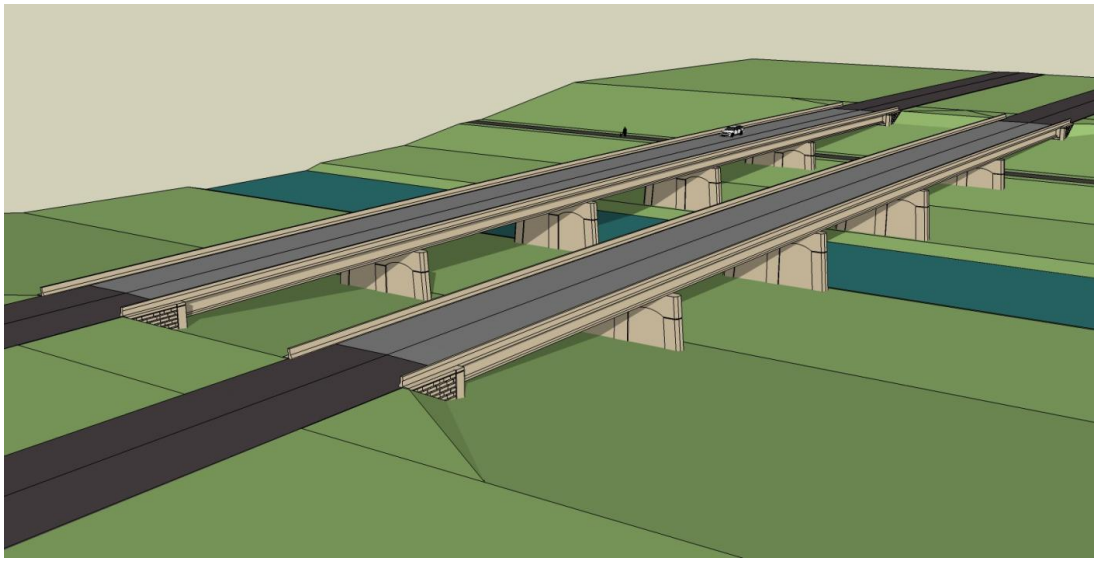
Feature	Acres (approx.)	% of TOTAL
Diversion Channel	6,800	82%
ND Embankment	1,100	13%
MN Embankment	430	5%
TOTAL	**8,330**	**100%**
Sub-Total ND	***7,900***	***95%***
Sub-Total MN	***430***	***5%***

Diversion Channel

50 million	30 miles
CY of excavation (cut/fill)	of channel excavation



16 Bridges, Includes Crossing I-29, I-94



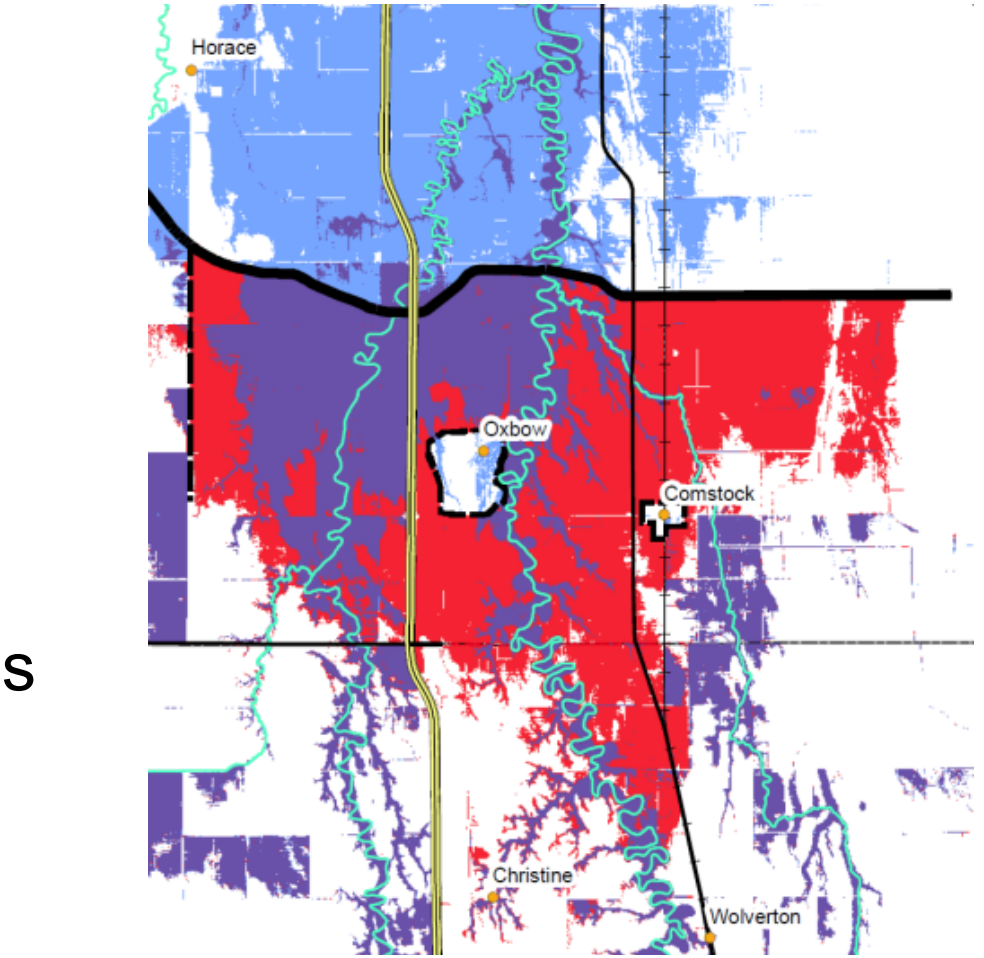
5 Railroad Brides, 2 Aqueducts

Conceptual Maple River Aqueduct Structure Illustration

3 Control Structures with Radial Arm Gates

Upstream Storage / Embankment

- Virtually eliminated all downstream impacts
- 150,000 acre-feet of Upstream Staging
- Defined area
- Ability to mitigate for impacts
- ~80 Residential Acquisitions



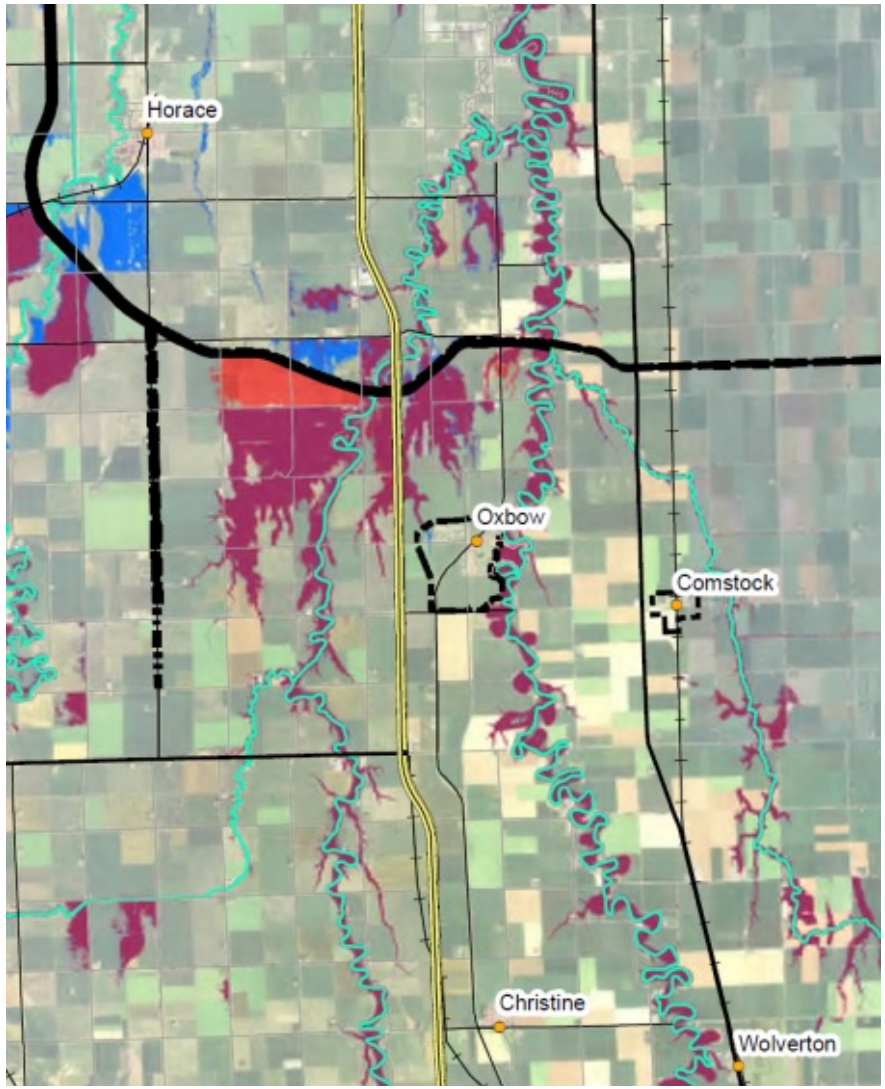
Levees through town

- In-town levees work complementary to the Diversion
- Flows through town were increased from 30’ to 35’ after FEIS
- Over 32 miles of permanent levee/flood walls since 2009
  - 20 miles in Fargo
  - 12 miles in Moorhead
- 622 acquisitions since 2009 (Moorhead, Cass, Fargo)

Project Operations

Project Operations

- No Project Operation Under 10-Year Flood Event
- 10-Year Flood Event = 35’ at Fargo Gage
- Project would not have operated during any historical summer event (1975, 2005, 2007, 2009)
- If had been in place, river levels would require operation 11 times, for ~70 days total over last 100+ years on record



Additional days of flooding (100-year event)

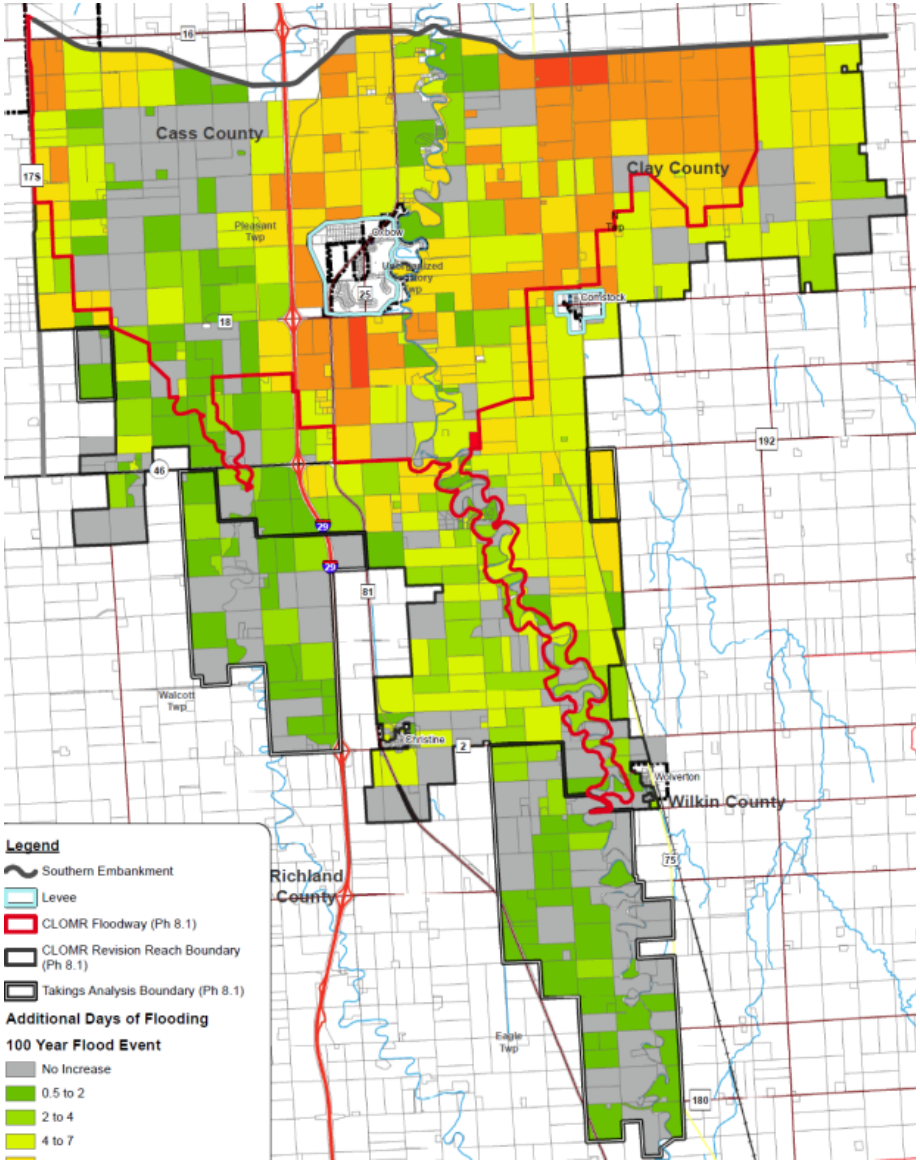
Legend

- Southern Embankment
- Levee
- CLOMR Floodway (Ph 8.1)
- CLOMR Revision Reach Boundary (Ph 8.1)
- Takings Analysis Boundary (Ph 8.1)

Additional Days of Flooding

100 Year Flood Event

- No Increase
- 0.5 to 2
- 2 to 4
- 4 to 7
- 7 to 10
- 10 to 14
- 14 to 21
- 21+



Mitigation Efforts

Mitigation Plan

The Mitigation Plan is 177 pages and is intended to be a living document

Mitigation Plan was developed to comprehensively address all Mitigation and to address concerns outlined in MDNR Final EIS

Federal project includes mitigation for impacted land and structures:

- Flowage easements
- Non-structural mitigation and community ring levees
- In-town Levees

Diversion Authority's Mitigation Plan includes additional steps:

- Post-operation cleanup
- Summer Operation Supplemental Farm Revenue Program
- Organic Farmland Acquisition Plan
- Cemetery Mitigation Plan

Agricultural Mitigation

Flowage Easements (778 parcels)

- A flowage easement is a one-time payment made to provide the legal ability to inundate property
- Diversion Authority is currently reviewing proposals to study value of flowage easements

Replacement Income (“Crop Insurance”)

- NDSU’s Agribusiness Department was contracted to study and quantify the impacts from the Project on farm revenue
- Additional legislative study between ND State Water Commission and NDSU has taken place

NDSU's Summary Conclusions

- Combining hydrology with historical data revealed
  - 85% chance that the Diversion will not operate in any given year
  - Effects of flooding will be over for a majority of lands approximately the same time regional planting starts.
- During a 25-yr or larger flood event, high probability (60% chance) of modest ($1 to $25/acre average within a storage area) revenue losses due to planting delays
- During a 25-yr or larger flood event, low probability (10% chance) of greater losses ($25 to $75 per acre)

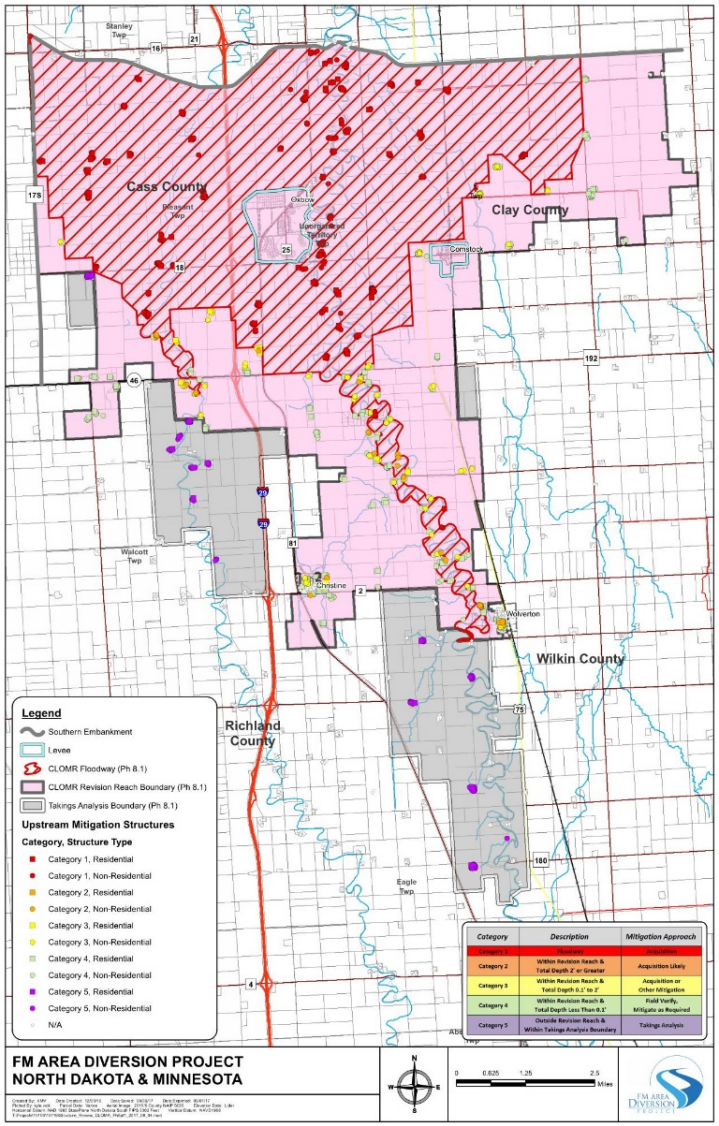
Organic Farmland

- There are four organic farming operations in the upstream retention area. (DNR FEIS, 2016)
- Early acquisition will be offered for organic farmlands.
  - Acquisition will allow sufficient time for the organic producer to establish new organic certified farmland
  - Will allow continuous organic farming while the operator is establishing organic certification on new lands. This typically takes three to five years.

Structure Mitigation

- Database coordinated with USACE, FEMA, MDNR, NDSWC
- Residential & Non-Residential
- Approx. 20 “active” farmsteads
- Approx. 75 residential properties

Category	*Description*	*Mitigation Approach*
Category 1	Floodway	Acquisition
Category 2	Within Revision Reach & Total Depth 2' or Greater	Acquisition Likely
Category 3	Within Revision Reach & Total Depth 0.1' to 2'	Acquisition or Other Mitigation
Category 4	Within Revision Reach & Total Depth Less Than 0.1'	Field Verify, Mitigate as Required
Category 5	Outside Revision Reach & Within Takings Analysis Boundary	Takings Analysis



Cemetery Mitigation

- Corps of Engineers has released a detailed report on the cemeteries in the region.
- Corps requirements include acquisition of a flowage easement
- A Local Cemetery Mitigation Team was formed to discuss additional, locally funded, mitigation options
  - Group has met, but has been on hold until resolution of litigation on implementation of upstream mitigation projects

Upstream Mitigation Projects

Oxbow-Hickson-Bakke Ring Levee Project

- Partial construction underway in accordance with April, 2017 Court Stipulation

Ring levee around Comstock, MN also planned as part of Federal Project

- Conceptual ring levee design is complete, but additional input and coordination with City is needed

Environmental Mitigation

Mitigation Plan also includes:

- Environmental Impacts and Mitigation
- Water Supply Impacts and Mitigation
- Groundwater or Sub-Surface Water Impacts and Mitigation
- Navigation Impacts and Mitigation
- Drainage Impacts and Mitigation
- Fish and Wildlife Habitat Impacts and Mitigation
- Agricultural Impacts and Mitigation
- Waterways, Bank Stability, Erosion, and Sedimentation Impacts and Mitigation
- Wetlands and Land Use Impacts and Mitigation
- Invasive Species Management Plan