

# Fargo-Moorhead Flood Risk Management Project

Supplement to Environmental Impact Statement (SEIS) Final Preparation Notice

May 21, 2018

## 1. Title of EIS being supplemented and date of completion:

- *Final Environmental Impact Statement, Fargo-Moorhead Flood Risk Management Project*
- Completed May 4, 2016

## 2. Description of Situation Necessitating Preparation of the Supplement

The previously proposed Fargo-Moorhead (FM) Flood Risk Management Project (the Project) was a dam and diversion channel system flood control project designed to divert flood waters around the cities of Fargo, Moorhead, and surrounding metropolitan areas. The FM Project called for the dam and associated staging area not be used until flood levels were approximately at or above the 10-year flood. Project components included, but were not limited to: a system of excavated channels; a channel inlet control structure; tieback and overflow embankments; river control structures on the Red and Wild Rice Rivers; an upstream floodwater staging area (staging area); aqueducts and inlet structures on tributaries; levees and floodwalls in the FM metropolitan area and the upstream staging area; community ring levees; non-structural features (such as buy-outs; relocations; or raising individual, existing structures); recreational features (such as multipurpose trails and pedestrian bridges); and environmental mitigation projects located inside and outside the Project area.

The Minnesota Department of Natural Resources (DNR) prepared a state Environmental Impact Statement (EIS) for the Project. The EIS was completed in accordance with the provisions of Minnesota Environmental Policy Act (MEPA; Minn. Stat. Ch. 116D) and concluded in June 2016 with DNR's EIS adequacy determination.

On February 18, 2016, prior to completion of state environmental review, the DNR received an application for a Dam Safety and Public Waters Work permit (2018-0386) for the FM Project, listing the Flood Diversion Board of Authority (the Diversion Authority) as the applicant. Based on the October 2016 Findings of Fact for the Dam Safety and Public Water Work Permit Application, the DNR denied the permit application for the proposed FM Project.

In early 2017, the Diversion Authority informally coordinated with DNR staff regarding the permit denial by engaging in work sessions aimed at addressing DNR's concerns and discussing potential options moving forward. Later in 2017, North Dakota Governor Doug Burgum and Minnesota Governor Mark Dayton created a joint Task Force to discuss flood control options and make recommendations. The Task Force created a Technical Advisory Group that included engineers and staff from the Diversion Authority and DNR. The Technical Committee presented the Task Force with engineering options to address concerns about project impacts.

The key variables discussed and decisions reached included:

- Level of Protection: Consensus on 100-year protection at 33,000 cubic-feet/second (cfs).
- Western Tie-Back: Consensus to shift the alignment to the west.
- Eastern Tie-Back: Recommendation to shift the Minnesota-side of the tieback at an angle so that it is relatively parallel to Wolverton Creek.
- Flows Through Town: Recommendation to design for a river stage of 37 feet through town.
- Northern Staging Area: Neutral design feature that would move the northwest segment of the diversion channel closer to the metropolitan area in order to stage additional water in the northwest portion of the project area.
- Southern Embankment: For the purpose of identifying a potential alignment recommendation, the Technical Advisory Group considered three different options for the dam alignment. The Task Force did not make recommendation for the alignment of the embankment.

On March 16, 2018, after considering the recommendations of the Task Force and Technical Advisory Group, and engaging in additional discussions with the DNR, U.S. Army Corps of Engineers, and Richland-Wilkin Joint Powers Authority, the Diversion Authority submitted a permit application for a revised FM Project, known as “Plan B”. The Plan B Project changes the alignments of the southern embankment alignment, the eastern tieback, and the western tieback. Plan B also allows more flows through town. These component changes result in a new inundation and staging area, and also result in modifications to, and elimination of, some project structures, such as the Comstock Ring Levee. The DNR has determined that these changes are “substantial and may affect the potential significant adverse environmental effects of the Project” (Minnesota Rules, part 4410.3000, subpart 3, item A(1)), and has ordered preparation of a Supplemental EIS (SEIS).

### 3. Scope of Supplement: Alternatives, Issues and Studies

Minnesota Rules part 4410.3000, subpart 5, requires the scope of a SEIS to be limited to alternatives, impacts, and mitigation measures not addressed, or inadequately addressed, in the Final EIS. An SEIS also must include a description of how the changes in the proposed project or new information may affect the potential significant environmental effects from the project or the availability of prudent and feasible alternatives.

#### A. Alternatives

The 2016 State Final Environmental Impact Statement (FEIS) included a robust evaluation of alternatives and fully-evaluated the Northern Alignment Alternative; these alternatives will not be revisited as part of this SEIS. The SEIS will address one alternative that includes the changes proposed to the Project. This alternative will be called “Plan B”. No additional alternatives are proposed to be evaluated in the SEIS. For comparison, the SEIS will describe the major differences between the previously-proposed Project and Plan B, as well as address the No Action Alternative with Emergency Measures.

Plan B is presented in the map (see Attachment A) and described by the project proposer as follows: The Project consists of a diversion channel around the western side of the Fargo-Moorhead urban area and the Dam/Southern Embankment (D/SE) south of the metropolitan area that will store water on a temporary basis to minimize downstream stage impacts.

#### i. Diversion Channel

The Diversion Channel would extend north approximately thirty (30) miles in length from the Diversion Inlet Control Structure near County Road 17 just southeast of Horace, ND, downstream to its outlet north of the Sheyenne River mouth near Georgetown, MN. The path of the Diversion Channel will take it west of Horace, West Fargo, and Harwood. The Diversion Channel intersects the Sheyenne River, Maple River, Lower Rush River, Rush River, and a number of additional public and private drains.

The Diversion Channel is designed to receive 20,000 cfs for the 100-year flood at the Diversion Inlet Control Structure and additional water from intersected downstream drainages. The Diversion Channel will have a bottom width of 300 feet and a variable-width, low-flow channel that has been sized based on sediment transport considerations.

The depth of the Diversion Channel will range from fifteen (15) to twenty five (25) feet deep excluding the low-flow channel and twenty (20) to thirty (30) feet deep including the low-flow channel. The general longitudinal slope of the diversion will be 0.9 feet/mile, with the low-flow channel having a slightly flatter slope due to the meandering pattern. The side slopes outward from the 300-foot bottom width will be 7H to 1V, and include geotechnical “benches” of zero (0) to thirty (30) feet wide, as needed, to provide additional stability to meet the required factors of safety.

#### ii. Dam/Southern Embankment

The D/SE consists of an earthen embankment and three (3) gated structures that control outflows from the D/SE: Diversion Inlet Control Structure, Wild Rice River Control Structure, and Red River Control Structure. The D/SE will be constructed to meet US Army Corps of Engineers dam safety criteria. It will generally have a top width of fifteen (15) feet with 4H to 1V side slopes. The D/SE extends approximately 18.7 miles from high ground in Minnesota to high ground in North Dakota along the alignment shown in the attached map (Attachment A).

The top elevation of the D/SE is 928.5 +/- 0.5 feet. The western end of the D/SE, west of the Diversion Inlet Control Structure, referenced as the Western Tie-Back, will likely consist of a lower reach that would function as a spillway to the west if a significant problem occurs during Project operation. This spillway would be constructed to a lower elevation than the top of D/SE, but it would be above the PMF design pool elevation.

#### iii. Red River and Wild Rice River Control Structures

A gated structure will be constructed adjacent to the Red River in Pleasant Township, Cass County, ND (Red River Control Structure). A similar gated structure will be constructed adjacent to the Wild Rice River in Pleasant Township, Cass County, ND (Wild Rice River Control Structure). The structures will be constructed adjacent to the existing channels in order to keep the sites dry during construction. The Red River Control Structure is expected to consist of three (3) 50-foot wide gates, and the Wild Rice River Control Structure is expected to consist of two (2) 40-foot wide gates. Gate structures are subject to final design. The sills of both structures will be at the existing river bed elevations.

Once the gated structures are built, the Red River and Wild Rice River will be rerouted through the gated structures. The gates will be fully open unless a flood event large enough to

warrant operation of the gates occurs. When operated during flood events, these structures and their gates will limit flows downstream in the natural channels and cause the water to accumulate upstream of the D/SE.

#### iv. Diversion Inlet Control Structure

The Diversion Inlet Control Structure will be located where the Diversion Channel crosses Cass County Highway 17 in the southwest quarter of Section 32, Stanley Township, Cass County, ND. The Diversion Inlet Control Structure will consist of three (3) 50-foot wide gates that will control flow going into the Diversion Channel. Conditions on the Red, Wild Rice, Sheyenne, Maple, and Rush Rivers, and Wolverton Creek will be monitored to determine gate operation need and to minimize downstream impacts.

#### v. Staging Area

Based on the estimated depth and duration of the 100-year flood, approximately 110,000 acre-feet of additional storage within approximately 28,000 acres is required to minimize downstream stage impacts. This required area of storage is generally referred to as the Staging Area. Water will begin to pool upstream of the D/SE when the gates of the Red and Wild Rice River Control Structures are partially closed to limit flows through the Fargo-Moorhead urban area. The Red River and Wild Rice River Control Structures will be operated to produce a pool of 921.0 feet for the 100-year flood and a pool of no greater than 922.5 feet at the Diversion Inlet Control Structure for all events up to the 500-year flood. The deeper portions of the Staging Area will be regulated as a floodway so that the required volume is maintained.

A ring levee system will surround the City of Oxbow, Village of Hickson, and the Bakke Subdivision (OHB) in the Staging Area. Interstate 29 will be raised through the Staging Area. The grade raise will be slightly above the 500-year flood elevation to maintain access when the control structure gates are in operation. Other roads within the Staging Area will be allowed to flood when the control structure gates are in operation. Utilities located in the Staging Area will be evaluated during Project design and raised or relocated as needed.

#### vi. Project Operation

Operation of the Project is similar to what is described in Section 2.1.1.14 and Appendix A (Draft Operation Plan for the Fargo-Moorhead Metropolitan Area Flood Risk Management Project) of the FEIS. The following description of D/SE operation is similar to the information contained in the FEIS (the change in alignment and the increase from 35 feet to 37 feet at the Fargo gage have resulted in some modifications to the plan of operation). During times of normal river flow (i.e., no flooding) and for all flood events where the stage at the U.S. Geological Survey (USGS) Gage 05054000 (Red River of the North at Fargo, ND), which will be called the Fargo gage in the rest of this document, would not exceed 37.0 feet: 1) the Red River and Wild Rice River Control Structures will remain fully open, and 2) the gates at the Diversion Inlet Control Structure will be closed.

Operation of the Red River and Wild Rice River Control Structures will begin when the combined flow at USGS Gage 0505152130 (Red River of the North at Enloe, ND) and USGS Gage 05053000 (Wild Rice River near Abercrombie, ND) reach 21,000 cfs. An analysis of historical floods indicates close to a 1:1 relationship between the sum of the Enloe gage and Abercrombie gage flows and the flow at the Fargo gage. If the sum of the flows at

Enloe/Abercrombie has not exceeded 21,000 cfs, no gate operations will be conducted. However, if the sum of the Enloe/Abercrombie gage flows exceeds 21,000 cfs, gate operations will begin immediately. On the rising limb of a typical flood hydrograph, when the total flow at the Enloe/Abercrombie gages is 21,000 cfs, the total flow through the Red River Control Structure (RRCS) and the Wild Rice River Control Structure (WRRCS) will likely be between 10,000 cfs and 15,000 cfs. Historically, the travel time for peak flows from Enloe/Abercrombie to Fargo is approximately two (2) days. Beginning gate operations before the flows through the Red River and Wild Rice River Control Structures exceed 21,000 cfs is necessary to store water during the rising limb of the hydrograph in order to meet the downstream stage impact requirements of the Project. A flow of 21,000 cfs is approximately a 5-percent annual chance exceedance (ACE) event (20-year flood) at the Fargo gage, meaning that only flows equal to or less frequently-occurring than the 5-percent ACE event will require operations.

Gate operations begin by first ensuring the gates of the Diversion Inlet Control Structure are closed. While the gates of the Diversion Inlet Control Structure are expected to be closed at all times, if a flood is expected to occur, the gates of the Diversion Inlet Control Structure may be opened and immediately closed in advance of the flood to ensure their successful operation once the actual operations commence. After ensuring the gates of the Diversion Inlet Control Structure are closed, all gates at both the Red River and Wild Rice River Control Structures will be partially closed to restrict flow entering the benefitted area. At this point water will begin to accumulate upstream of the structures.

Project operations are based on synthetic event HEC-RAS model runs using balanced hydrographs for the 4-percent, 2-percent, 1-percent, and 0.2-percent ACE events as well as extreme floods, including the PMF and ½ PMF events. The modeling effort also includes historic events to make sure the operating plan produces the desired results for actual events. A gate flow release algorithm was developed to determine the appropriate flow releases through the three (3) gated structures in order to meet the stage impact requirements of the Project. This algorithm considers the flows of six (6) rivers (Red River, Wild Rice River, Wolverton Creek, Sheyenne River, Maple River, and Rush River) and operational limits. The portion of the algorithm that accounts for the flows and timing of the six (6) rivers is based on a power law function. The operational limits include:

Red River Control Structure and Wild Rice River Control Structure gate changes will be limited to ensure the rates of stage rise and stage fall in the benefitted area do not exceed natural rise or fall rates. A quick stage rise might impact public safety. A quick stage fall may impact bank stability.

Diversion Inlet Control Structure gates will be operated to limit flow increase to 2,000 cfs per hour until a sufficient flow depth in the Diversion Channel is realized. This will minimize the potential for channel erosion.

Red River and Wild Rice River Control Structure gate opening changes will be limited to ensure the rate of stage fall in the Staging Area is in line with the natural rate of stage fall, which reduces the potential for bank instability and fish stranding.

An evacuation order will be issued for the Fargo-Moorhead urban area as the pool approaches an elevation of 923.5 feet. To prevent the pool elevation from exceeding 923.5 feet, the RRCS

and WRRCS gates would be opened to maintain a pool elevation of 923.5 feet and stages would rise above 40.0 feet at the Fargo gage resulting in flooding of the Fargo-Moorhead urban area. There is sufficient flow capacity at the gated structures to keep the maximum pool level at or below 923.5 feet up through the PMF event.

## B. Issues and Studies

The State FEIS fully-evaluated the environmental effects of the previously-proposed Project on sixteen topics. The proposed changes are not expected to result in significantly new impacts for some of the sixteen topic areas that were included in the 2016 FEIS; thus, additional information on those topics will not be required as part of the SEIS. The topics that have been adequately evaluated in the FEIS include:

- Cold Weather Impacts on Aqueduct Function and Biotics.
- Cover Types.
- Potential Environmental Hazards.
- Invasive Species.

The topics outlined below have the potential for substantial changes in evaluation from the FEIS. These changes could affect the potential significant environmental effects of the project or the availability of prudent and feasible alternatives. As a result, these topic areas will be evaluated in the SEIS. If new studies or reports will be referenced during SEIS preparation, they are noted below by topic area.

### i. Hydrology and Hydraulics

The SEIS will include a description and evaluation of the updated Phase 9 Hydrology, which includes using the full Period of Record for calculating the 100-year flood. This section will include a description of any upstream or downstream impacts resulting from a re-aligned southern embankment, tie-back levees and allowing more flows through town, including in-town levees.

- Study/report: 2018 Hydrology & Hydraulics Report and outputs (maps, depth, duration, locations).

### ii. Federal Emergency Management Agency (FEMA) Regulations and the Conditional Letter of Map Revision (CLOMR) Process

This section will discuss, if necessary, any updates to the FEMA/USACE Coordination Plan. Additional evaluation will be conducted on the updated revision reach, takings analysis, CLOMR footprint, acquisition plan and structure counts.

- Study/report: 2018 Property Rights Acquisition and Mitigation Plan v.2.

### iii. Stream Stability

The DNR will describe how the changes would affect stream stability of the project area, as well as evaluate mitigation and monitoring suitability.

- Study/report: 2018 Property Rights Acquisition and Mitigation Plan v.2.

### iv. Wetlands

The SEIS will include updated wetland impact acreages (direct and indirect) and evaluate mitigation and monitoring suitability.

- Study/report: 2018 Property Rights Acquisition and Mitigation Plan v.2.

#### v. Aquatic and Terrestrial Resources

The DNR will evaluate and describe how the proposed changes would affect aquatic and terrestrial resources of the project area, including fish passage and stranding in the staging area and the diversion channel, and habitat. The section will also evaluate mitigation and monitoring suitability.

- Study/report: 2018 Property Rights Acquisition and Mitigation Plan v.2.

#### vi. State-listed species

The DNR will conduct a new Natural Heritage Information System (NHIS) review of the project area, and if any new features are found, this section will include a description of the environmental consequences and mitigation. If no new features are found, a statement will be reported in the SEIS.

#### vii. Cultural Resources

This section will evaluate and describe updated and potential cultural resource impacts, including historic properties, and proposed mitigation.

- Study/report: USACE Cultural Resources study.

#### viii. Infrastructure

This section will include an evaluation and description of how the changes would affect public infrastructure of the project area, including roads, bridges, railroads, and drainage as well as evaluate mitigation and monitoring suitability.

- Study/report: 2018 Property Rights Acquisition and Mitigation Plan v.2.

#### ix. Land Use Plans and Regulations

The SEIS will include a description of how the project changes would relate to local land use plans and regulations. This section will include an evaluation of proposed operation, maintenance and mitigation.

- Study/report: Various local governmental unit land use plans and regulations.

#### x. Dam Safety

The Dam Safety section will include an evaluation of the dam breach analysis and the Operation, Maintenance, Repair, Replacement and Rehabilitation (OMRR&R) Plan.

- Study/report: Operation, Maintenance, Repair, Replacement and Rehabilitation (OMRR&R) Plan.

#### xi. Socioeconomic

The socioeconomic section will not include a reevaluation of the cost-benefit analysis, regional economic impact, and demographic analysis. This section will include an evaluation of impacts to structures, organic farms and cemeteries. Additionally, the DNR will discuss proportional impacts between the two states, the benefited/unbenefited area, and flood risk transfer.

- Study/report: Various local governmental unit land use plans and regulations.
- Study/report: 2018 Hydrology & Hydraulics Report and outputs (maps, depth, duration, locations).

#### xii. Cumulative Potential Effects

The DNR will check with local planning departments and watershed districts to determine if

there are any reasonable foreseeable projects for which a basis of expectation has been laid, that were not identified in the 2016 FEIS. If no projects can be identified, a statement will be reported in the SEIS.

#### xiii. Comparison of Alternatives

The SEIS will include a summary description of major differences between the No Action Alternative with Emergency Measures, the previously proposed Project, and Plan B. Since Plan B includes a new hydrology phase, the SEIS will discuss implications of the new modeling for comparing alternatives.

- Study/report: 2018 Hydrology & Hydraulics Report and outputs (maps, depth, duration, locations).

#### xiv. Proposed Mitigation and Monitoring

The Mitigation and Monitoring section will include a description of major differences between the 2016 and 2018 Mitigation and Monitoring plans and proposals, and an evaluation of updated mitigation and monitoring sufficiency.

- Study/report: 2018 Property Rights Acquisition and Mitigation Plan v.2.

### 4. Proposed Time Schedule

The time limit for a determination of the adequacy of a SEIS is outlined in Minnesota Rules, part 4410.3000, subpart 6, and states that an SEIS must be made within 120 days of the order for preparation of the supplement, unless the time is extended by the consent of the proposer and Responsible Government Unit or by the Governor.

Preparation Notice Publication	May 21, 2018
Preparation Notice Comment Period Ends	June 11, 2018
Distribution of Draft Supplemental EIS	July 2018
Distribution of Final Supplemental EIS	September 2018
Determination of SEIS Adequacy	October 2018