FARGO-MOORHEAD FLOOD RISK MANAGEMENT PROJECT - DAM SAFETY AND PUBLIC WATERS WORK PERMIT

FINDINGS OF FACT, CONCLUSIONS, AND ORDER OF COMMISSIONER

December 27, 2018

LIST OF ACRONYMS

AAD	Average Annual Damages
AMMP	Adaptive Management and Monitoring Plan
BCR	Benefit Cost Ratio
BFE	Base Flood Elevations
BMPs	Best Management Practices
BRRWD	Buffalo-Red River Watershed District
BWSR	Minnesota Board of Water and Soil Resources
CCJWRD	Cass County Joint Water Resources District
CDQ	Council on Environmental Quality
cfs	Cubic feet per second
CLOMR	Conditional Letter of Map Revisions
DNR	Department of Natural Resources
DSA	Distributed Storage Alternative
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
ESA	Environmental Site Assessment
EQB	Environmental Quality Board
EWR	Ecological and Water Resources
FAW	Fish and Wildlife
FCP	Federally Comparable Plan
FDR	Flood Damage Reduction
FEMA	Federal Emergency Management
FEIS	Final Environmental Impact Statement
FFREIS	Final Feasibility Report and Environmental Impact Statement
FM	Fargo-Moorhead
FOF	Findings of Fact
FRP	Federally Recommended Plan
HAZUS	Hazard Analysis United States
HEC-FDA	Hydrologic Engineering Center's Flood Damage Reduction Analysis
HEC-FIA	Hydrologic Engineering Centers's Flood Impact Analysis
IBI	Index of Biotic Integrity
JPA	Joint Powers Agreement
LUG	Local Government Unit
LOMR	Letter of Map Revision
LPP	Locally Preferred Plan
MDA	Minnesota Department of Agriculture
MEPA	Minnesota Environmental Policy Act
MERA	Minnesota Environmental Rights Act
MN	Minnesota
MnDOT	Minnesota Department of Transportation
MPARS	MNDNR Permitting and Reporting System
MPCA	Minnesota Pollution Control Agency
NAA	Northern Alignment Alternative
NAVD	North American Vertical Datum
ND	North Dakota
NED	National Economic Development Plan
NFIP	National Flood Insurance Program

LIST OF ACRONYMS

OHB	City of Oxbow, Village of Hickson, and Bakke Subdivision
OHW	Ordinary High Water Level
POR	Period of Record hydrology
PRAM	Property Rights Acquisition & Mitigation
RED	Regional Economic Development
RGU	Responsible Government Unit
ROD	Record of Decision
RRBFDR	Red River Basin Flood Damage Reduction
SEIS	Supplemental Environmental Impact Statement
SFHA	Special Flood Hazard Areas
USACE	United States Army Corps of Engineers
USGS	United States Geologic Survey
WRD	Water Resources District
WD	Watershed District

STATE OF MINNESOTA
DEPARTMENT OF NATURAL RESOURCES
DAM SAFETY AND PUBLIC WATERS WORK PERMIT APPLICATION 2018-0819
FINDINGS OF FACT

In the Matter of the Dam Safety and Public Waters Work Permit Application 2018-0819 for the Fargo-Moorhead Flood Risk Management Project, Clay and Wilkin Counties, Minnesota, and Cass and Richland Counties, North Dakota	) **)**))))	**FINDINGS OF FACT CONCLUSIONS AND ORDER**

Based upon, and after having considered the entire record of the proceeding, including written reports, written and oral data, information, and statements, the Minnesota Department of Natural Resources ("DNR") makes the following:

FINDINGS OF FACT

I. EXECUTIVE SUMMARY

1. Pursuant to the requirements of Minn. Stat. § 103G.245, subd. 1 and Minn. R. Ch. 6115 the Cities of Fargo, North Dakota and Moorhead, Minnesota together with the U.S. Army Corps of Engineers ("USACE") and the Flood Diversion Board Authority ("Diversion Authority") (collectively referred to as "Permit Applicants") applied for a Minnesota public waters work permit and a Minnesota dam safety permit (collectively referred to as the "Permit Application" or "2018 Application") to construct a flood risk reduction project on the Red River of the North ("Red River") to reduce flood risk associated with the long history of frequent flooding of the Red River and its associated tributaries in the Fargo-Moorhead (F-M) metropolitan area, to qualify portions of the F-M metropolitan area for a 1-percent chance flood protection accreditation under the National Flood Insurance Program and to reduce flood risk for floods exceeding the 100-year (1-percent chance) flood or greater in light of the importance of the F-M metropolitan are to the region.

2. The City of Fargo, City of Moorhead, and Diversion Authority, in 2016, had submitted a permit application for a flood risk reduction project. The DNR, on October 3, 2016, denied that application. The Permit Application currently pending before the DNR is for a flood risk reduction project ("Revised Project") that is a revision of the project submitted in the 2016 permit application.

3. As detailed below, the DNR has reviewed the record and concludes that the Permit Applicants have met their burden of proof and are entitled to issuance of the Permit for the Revised Project.

II. PROJECT ENVIRONMENTAL SETTING

4. The Fargo-Moorhead (F-M) metropolitan area lies approximately 12 miles west to 6 miles east of the Red River of the North (Red River) and from 20 miles north to 20 miles south of Interstate Highway 94. The Red River flows north. The city of Fargo, North Dakota is located on the Red River's west bank and the city of Moorhead, Minnesota is located across the Red River from Fargo on the east bank of the Red River. The two cities have a long history of flooding.

5. The Red River has exceeded the National Weather Service flood warning stage of 18 feet at the United States Geological Survey (USGS) gage in Fargo (Fargo gage) 52 years between 1902 and 2017 and every year except 2012 and 2016 from 1993 through 2017. The hydrologic record of the Red River shows a trend of increasing frequency and magnitude of flooding. Minnesota Department of Natural Resources, *Final Environmental Impact Statement: Fargo-Moorhead Flood Risk Management Project,* at ES-8 (May 2016) (State FEIS).

6. Flooding of the Red River typically occurs in late March and early April as a result of spring snowmelt. The Red River's significant history of flooding can be attributed to both the local topography and ice conditions on the Red River. The Wild Rice River, Sheyenne River, Maple River, Lower Rush River, and Rush River also contribute to the flood risk within the F-M metropolitan area.

7. Because of the size of and conditions in the Red River watershed, the National Weather Service flood forecast hydrologists are able to provide substantial advance warning of potential flood events. This advance warning has historically been sufficient to permit effective deployment of emergency measures to mitigate flood damage.

8. Flooding has historically damaged urban and rural infrastructure including transportation infrastructure throughout portions of the F-M metropolitan area. The F-M metropolitan area is a regional center for healthcare, education, government, and commerce.

9. In 1997, the Red River Basin experienced a large flood event close to a 100-year flood. The Basin had not experienced a flood of that magnitude since the late 1800s. Many cities, such as Grand Forks and Fargo, did not have flood risk reduction measures in place for an event of this magnitude and experienced significant damage. Since the 1997 flood, the cities of Fargo and Moorhead and surrounding communities have implemented and continue to implement flood risk reduction measures, including: acquiring and removing structures, constructing levees and floodwalls, raising and stabilizing existing levees, installing permanent pump stations, and improving storm sewer lift stations and the sanitary sewer system. Additionally, the two cities are constructing, or have constructed, levees and floodwalls with a top elevation of 44.0 feet (referenced to the gage height). *See* Permit Application at 12 and Minnesota Department of Natural Resources, *Final Environmental Impact Statement: Fargo-Moorhead Flood Risk Management Project* (Nov 2018) (State FEIS) § 2.2.2.1.

10. But the levees and floodwalls tie into existing high ground with elevations that can be as low as the current effective Federal Emergency Management Agency (FEMA) 100-year flood level of 39.2 feet. *See* Final SEIS Table 3.1. Additional emergency measures would be needed to provide protection during the 100-year flood level of 41.3 feet as determined by the Period of Record (POR) hydrology. *Id*. FEMA continues to use a 100-year flood stage based on hydrology that dates back to the 1970s. The updated POR hydrology uses records through 2009. *See* Permit Application at 11.

11. The existing flood risk reduction projects in the F-M metropolitan area are primarily designed to provide protection at the current FEMA 100-year flood level. Some of the flood risk reduction projects provide protection for the POR 100-year flood elevation, but do not have sufficient freeboard and/or tie-in elevations for FEMA accreditation under the period of record (POR) hydrology. It is anticipated that incorporating the large, recent floods into FEMA's accreditation analysis will cause FEMA's 100-year flood to increase. *See* Permit Application at 7 through 8. FEMA accreditation eliminates the requirement to purchase flood insurance for structures in the 100-year floodplain with federally-backed mortgages. Currently, there is effective flood protection up to the 100-year flood event for many of developed properties using the POR hydrology. However, property owners with federally-backed mortgages would still be required to acquire flood insurance because the freeboard and/or tie-in elevations will not meet FEMA standards once FEMA updates the 100-year flood elevation. See State FEIS, Appendix N (discussing the differences between flood elevations when applying different hydrology methodologies). In addition, there are a number of gaps in permanent flood protection. In major flooding events, these gaps have historically been addressed using emergency measures. *See State of Minnesota Department of Natural Resources Dam Safety And Public Waters Work Permit Application 2016-0386 Findings of Fact, Conclusions and Order,* Attachment 1 in the 2016 Findings of Fact (Oct. 3, 2016) (2016 FOF).

12. The City of Moorhead is at a higher elevation than the City of Fargo. Moorhead has over 64,000 linear feet of completed or in-progress flood risk reduction projects. The total projected cost for implementing all of the in-town flood risk reduction projects (completed, in-progress, and funded) in Moorhead and its immediate vicinity is approximately $137 million. Most of the levees have a top elevation of at least 44.0 feet. *See* State FEIS § 2.2.2.1.2. With the planned completion of these projects, the majority of developed properties within the City of Moorhead would be protected from the POR 100-year flood event.

13. The City of Fargo has over 83,000 linear feet of completed or in-progress flood risk reduction projects. A little over 21,000 additional feet of flood risk reduction projects are planned and funded for implementation in the near future. The total projected cost for these in-town flood risk reduction projects in Fargo (completed, in-progress, and funded) is approximately $187 million. Most of the levees have a top elevation of at least 44.0 feet. *See* State FEIS § 2.2.2.1.2.

14. The Red River has reached the National Weather Service flood warning stage of 18 feet in 52 of the past 116 years. At 18 feet, some street closings are needed in Fargo. At moderate flood stage of 25 feet, flooding begins in Fargo and Moorhead parks and recreation

areas along the Red River. At major flood stage of 30 feet, emergency measures become necessary in the F-M metropolitan area. Major flood stage has occurred 15 times over the 116-year period of record. *See* http://water.weather.gov/ahps2/hydrograph.php?wfo=fgf&gage=FGON8, (Last visited at August 9, 2018).

15. Without the use of emergency measures (e.g., levees, sandbagging, floodwall closures), the F-M metropolitan area would experience approximately 215,000 acres of flooding at various depths for the 100-year flood event. By employing emergency measures, flooding for a 100-year event is significantly mitigated within the developed parts of the Cities of Fargo and Moorhead. *See* 2016 FOF, Attachment 1of 2016 FOF and State Final SEIS, Figure 1

16. The USACE updated its damage estimates in 2017; this updated analysis estimates average annual damages (AAD) from floods, assuming no emergency measures and without recent permanent flood damage reduction measures, have the potential to exceed $236.2 million. *See* E-mail from Terry Williams to Pooja Kanwar (October 26, 2018). The USACE's previous 2011 analysis estimated the potential AAD at $194.8 million. *See* 2016 FOF at ¶ 19. The DNR was unable to independently verify either of these numbers. However, it is clear that these numbers do not account for the protection afforded by emergency measures or the recently completed in-town flood risk reduction measures.

17. The DNR's 2016 economic impact analysis found the AAD to be $51 million. *See* State FEIS Table 3.88. This analysis has not been updated by DNR. The DNR has not been able to verify the discrepancies in the DNR and USACE ADD analysis in part because the USACE uses USACE Hydrologic Engineering Center's Flood Damage Reduction Analysis, (HEC-FDA), a model that includes proprietary data that has not been made available to the DNR. The DNR's analysis uses FEMA's Hazard Analysis United States (HAZUS), which does not make use of the USACE's proprietary data.

III. ENVIRONMENTAL REVIEW OF THE PROPOSED FARGO-MOORHEAD PROJECT

A. Procedural History (Prior EIS, 2016 Permit Decision, and Governors' Task Force)

18. In May 2016, the DNR issued the *Final Environmental Impact Statement Fargo-Moorhead Flood Risk Management Project* (State FEIS) for the F-M Flood Risk Management Project (the 2016 Project). The 2016 Project for which the DA and the Cities of Fargo and Moorhead sought a permit was the Locally Preferred Plan (LPP) identified by the USACE in its 2011 Final Feasibility Report and Environmental Impact Statement (FFREIS). Other alternatives evaluated in the FFREIS included Minnesota 40K, which was the National Economic Development (NED) Plan and the USACE's recommended alternative. The local sponsors requested that the LPP be advanced instead of the NED. The Federally Comparable Plan (FCP) was the Minnesota 35K and was the federal plan used to determine the federal cost share that would be available if the local sponsors chose to pursue the LPP. The FCP provides comparable

total annual economic benefits to the LPP. The NED plan is a smaller Minnesota alternative that also produced a comparable level of benefits to the LPP. *See* 2011 USACE Final Feasibility Report and Environmental Impact Statement (2011 FFREIS) at ES 6-7 (July 2011).

19. The State FEIS was completed in accordance with the provisions of Minnesota Environmental Policy Act (MEPA) as set forth in Minn. Stat. Ch. 116D and concluded in June 2016 with DNR's EIS adequacy determination.

20. The 2016 Project was a diversion channel system project designed to divert flood waters around the Cities of Fargo and Moorhead, and surrounding areas. The dam and associated staging area would not be used until flood levels were approximately at or above the 10-year flood. 2016 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 F-M 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. *See* State FEIS § 2.1. A key component of the 2016 Project was the 32,000 acre staging area located immediately upstream of the dam. The staging area did not, however, constitute the total area affected by operation of the 2016 Project. In a 100-year flood event, the 2016 Project would newly inundate 20,000 acres, only some of which are within the boundaries of staging area. *See* State FEIS at ES-61 and 2016 FOF, Attachment 2: 100-year_Event_with_and_without_Project

21. On February 18, 2016, prior to completion of state environmental review, DNR received Dam Safety and Public Waters Work permit application 2016-0386 for the 2016 Project (2016 Permit Application). The 2016 Permit Application was received through the MNDNR Permitting and Reporting System (MPARS).

22. The permit applicant for the 2016 Project was the Flood Diversion Board of Authority (Diversion Authority), the City of Fargo, North Dakota (ND) and the City of Moorhead, Minnesota (MN) (collectively referred to as the 2016 Permit Applicant).

23. The Diversion Authority was created in 2011 when the Cities of Fargo and Moorhead, along with Cass County (ND), Clay County (MN), the Cass County Joint Water Resources District (CCJWRD)(ND), and the Buffalo-Red River Watershed District (BRRWD)(MN) entered into a joint powers agreement (JPA). The purpose of the JPA was to establish a framework for the planning, design and management of the proposed Project. The Diversion Authority has partnered with the United States Army Corps of Engineers to plan, authorize, secure funding for, and construct a flood risk reduction project for the F-M metropolitan area. Ownership, operation, and maintenance of the 2016 Project was to be the collective responsibility of the Diversion Authority, the City of Moorhead, the City of Fargo, and other potential non-Federal sponsors

24. In June 2016, the Diversion Authority reconfigured the JPA. As reconfigured, the Diversion Authority JPA no longer included the Buffalo-Red River Watershed District.

25. On October 3, 2016, DNR Commissioner Tom Landwehr, denied the 2016 Permit Application, finding that the 2016 Project:

> [D]oes not adequately protect the public health, safety and welfare of its citizens, does not represent the minimal impact solution, and is neither reasonable nor practical. The DNR further finds that the proposed Project has significant environmental impacts that are not compliant with prudent environmental requirements. Economic benefits alone do not justify a project with the extensive socioeconomic and environmental impacts posed by this Project. The No Action Alternative with Emergency Measures represents a feasible, prudent, and minimal-impact alternative to provide flood protection to the F-M metropolitan area.

See State of Minnesota Department of Natural Resources Dam Safety And Public Waters Work Permit Application 2016-0386 Findings of Fact, Conclusions and Order, ¶ 198 at 48 (Oct. 3 2016) (2016 FOF). The DNR further found that the 2016 Project failed to "adequately mitigate for adverse impacts" and was "not consistent with state floodplain requirements or local plans." *Id*.

26. On October 28, 2016, the Diversion Authority challenged the DNR's permit denial by requesting a contested case hearing pursuant to the requirements of Minn. Stat. § 103G.311, subd. 5.

27. On April 21, 2017, the DNR filed a motion in U.S. District Court for the District of Minnesota requesting that the Court enjoin both the Diversion Authority and the USACE from continuing construction on the 2016 Project without the necessary DNR permit. On September 7, 2017, the U.S. District Court issued a preliminary injunction against the USACE and the Diversion Authority prohibiting them from proceeding with construction of the 2016 Project. The Diversion Authority appealed this decision to the Eighth Circuit Court of Appeals.

28. As a result of the permit denial and ongoing litigation, North Dakota Governor Doug Burgum and Minnesota Governor Mark Dayton created a joint Task Force (Governors' Task Force) in October 2017 to "develop design principles and concept-level engineering solutions to achieve balanced flood risk management for the Fargo-Moorhead region, including up-and downstream communities and properties." *See Fargo Moorhead Area Flood Diversion Task Force Charter*. The Governors' Task Force was jointly chaired by Governors Dayton and Burgum and was supported by a Technical Advisory Committee/Technical Advisory Group that included engineers and staff representing the Cities of Fargo and Moorhead, the DNR, and surrounding communities. *Fargo-Moorhead Area Flood Diversion Task Force: Final Report,* at 3 (January 18, 2018)(Task Force Report). The Governors' Task Force, with the assistance of the Technical Advisory Committee/Group developed several options and made recommendations regarding specific aspects of flood risk reduction efforts, but did not reach agreement on any specific option. The Task Force Report and supporting technical materials from the Technical

Advisory Committee/Group were forwarded to the Diversion Authority for its consideration. The Task Force Report did include a similar option to the Plan B option that was referenced as 7A. After completion of the Task Force Report, the Technical Advisory Committee/Group was asked to explore ways to address concerns raised by individual task force members, including issues raised by the BRRWD and the JPA. As a result of these deliberations, the Technical Advisory Committee/Group developed an option 7A + 10D. Option 7A + 10D is very similar to the Plan B option.

B. DNR Prepares a Supplemental Environmental Impact Statement

29. On March 16, 2018, the Diversion Authority together with the City of Fargo, the City of Moorhead, and the USACE applied for a Dam Safety and Public Waters Work permit, Permit Application 2018-0819 (2018 Application). The 2018 Application was for a revision of the 2016 Project (herein after referred to as the Revised Project or Plan B). The Revised Project was similar to that identified by the Technical Advisory Committee/Group as Option 7A and referred to generally as Plan B. The Revised Project included changes in the alignment of the southern embankment and eastern and western tieback levees and allows for more flows through town. These changes resulted in modifications to the inundation area from the 2016 Project, and included modifications to, and elimination of, some project structures, such as the Comstock Ring Levee. After evaluating the 2018 Application pursuant to the requirements of Minn. R. 4410.3000, subp. 3A the DNR determined that, as proposed, the Revised Project was substantially different than the 2016 Project and could result in potential significant adverse environmental effects not previously, or adequately, analyzed in the State FEIS. Therefore, pursuant to the requirements of Minn. R. 4100.3000, subp. 3, the DNR ordered the preparation of a State Supplemental EIS (State SEIS) to analyze the environmental effects of the Revised Project.

30. A SEIS Preparation Notice (Notice) for the Revised Project was published in the May 21, 2018 edition of the *EQB Monitor* (Vol. 42, No. 21). Minn.R. 4410.3300, subp. 5. The Notice included a proposed scope for the State SEIS and invited public comment on the proposed scope between May 22 and June 11, 2018, as required by Minn. R. 4410.3300, subp. 5. The DNR received forty-six (46) public comments during the scoping public comment period and considered these comments in preparing the Draft SEIS (Draft SEIS). Minnesota Department of Natural Resources, *Fargo-Moorhead Flood Risk Management Project Final Supplemental Environmental Impact Statement*, at ES-5 (November 12, 2018)(Final SEIS).

31. The DNR, on August 27, 2018 issued a Draft SEIS by publication in the *EQB Monitor*. 42 *EQB Monitor* (Aug. 27, 2018). Publication of the Draft SEIS coincided with the commencement of the 30-day comment period required by Minn. R. 4410.3000, subp. 5C and Minn. R. 4410.2600, subp. 2 through 6. A public informational meeting on the Draft SEIS was held on September 13, 2018. *Id*. The public comment period was closed on September 27, 2018. *Id*.

32. The DNR received 107 written letters, emails and oral testimony commenting on the Draft SEIS and considered all substantive comments for potential revisions to the Final SEIS. *See* Final SEIS Appendix A (outlining responses to comments received during the public comment period).

33. The Final SEIS was issued on November 13, 2018 by publication in the *EQB Monitor*. Publication of the Final SEIS commenced a 10-day comment period on the Final SEIS as required by Minn. R. 4410.3000, subp. 5 D and Minn. R. 4410.2700. The public comment period for the Final SEIS was closed on November 29, 2018. All comments received during this public comment period that addressed the criteria for adequacy were considered in making the final adequacy determination for the Final SEIS as required by Minn. R. 4410.3000, subp. 5E.

34. The DNR made its final adequacy determination on the Final SEIS on December 27, 2018.

C. Summary of Analysis within the State FEIS and Final SEIS

35. Pursuant to Minn. R. 4410.2400, the SEIS incorporates material from the State FEIS by reference to reduce the bulk without impeding governmental and public review of the project. The 2016 State FEIS fully evaluated the environmental effects of the 2016 Project on sixteen topics. Plan B was not expected to result in significantly different impacts for five of the sixteen topic areas that were included in the 2016 State FEIS; thus, additional information on those topics was not required as part of the SEIS. Changes in Plan B could affect the potential for significant environmental effects of the other eleven topics evaluated in the 2016 State FEIS.

36. Chapter 1 of the State FEIS and the Final SEIS outline the need for the preparation of an EIS for the Project, the EIS process, the scope and timeline for the EIS, the purpose and need of the Project, and the necessary governmental approvals required for the Project, should it proceed to construction.

37. Chapter 2 of the State FEIS and the Final SEIS describe the Alternatives evaluated, including the Plan B Alternative, the Northern Alignment Alternative and the No Action Alternative with emergency measures. A more detailed discussion of the alternatives and alternative analysis undertaken in both the State FEIS and Final SEIS are contained in ¶¶ 47 through 54.

38. Chapter 3 of the State FEIS and the Final SEIS contain a discussion of the affected environment and environmental consequences of the 2016 Project and Revised Project and its alternatives. The topics that were adequately evaluated in the State FEIS included: Cold Weather Impacts on Aqueduct Function and Biotics, Cover Types, Potential Environmental Hazards, State-listed and Special Statues Species, and Invasive Species. The following topic areas were evaluated in both the State FEIS and the Final SEIS: Hydrology and Hydraulics, Federal Emergency Management Agency (FEMA) Regulations and the Conditional Letter of Map Revision (CLOMR) Process, Wetlands, Aquatic and Terrestrial Resources (combined Wildlife, Stream Stability and Fish Passage sections of the State FEIS), Cultural Resources, Infrastructure, Land Use Plans and Regulations, Dam Safety and Public Waters Regulations and

Permitting, and Socioeconomics. A more detailed discussion of the environmental and socio-economic effects of and mitigation for the Revised Project is set forth in ¶¶ 55 through 66, ¶¶ 190 through 204, and ¶¶ 221 through 232

39. Chapter 4 of the Final SEIS discusses the potential cumulative effects of the Revised Project.

40. Chapter 5 of the Final SEIS, together with Appendix A and Appendix B, contains a discussion of alternatives considered for the Revised Project, including those alternatives that were analyzed but ultimately screened out because they did not meet the requirements set forth in Minn. R. 4410.2300, G, which provides in part that:

> An alternative may be excluded from analysis in the EIS if it would not meet the underlying need for or purpose of the project, it would likely not have any significant environmental benefit compared to the project as proposed, or another alternative, of any type, that will be analyzed in the EIS would likely have similar environmental benefits but substantially less adverse economic, employment, or sociological impacts.

41. A more detailed discussion of alternatives is contained in ¶¶ 47 through 54.

42. Chapter 6 of the Final SEIS contains a discussion of proposed and recommended mitigation and monitoring. A more detailed discussion of proposed mitigation and monitoring is ¶¶ 134 through 139, ¶¶ 190 through 204, and ¶¶ 221through 232.

43. Chapter 7 of the State FEIS and the Final SEIS explains that the DNR coordinated and consulted with numerous parties while preparing the Final SEIS, including, but not limited to: (1) the DNR Divisions of Ecological and Water Resources and Fish and Wildlife, (2) the USACE, (3) the Diversion Authority, and (4) members of the public.

44. Chapter 8 of the State FEIS and the Final SEIS is a list of those persons who were involved in the preparation of the EIS.

45. Chapter 9 of the State FEIS and the Final SEIS contain a list of references used in the preparation of the EIS.

46. The Final SEIS also includes the following Appendices related to the Revised Project:

A. Responses to Comments on the Draft SEIS (DNR) – November 2018
B. Supplemental EIS Alternatives Screening Summary (DNR) – November 2018
C. Hydrology and Hydraulics; Fargo-Moorhead Metropolitan Area Flood Risk Management Project (USACE) – August 8, 2018

D. F-M Diversion Plan B Transportation Master Plan (Diversion Authority) – June 7, 2018
E. Updated FEMA/USACE Coordination Plan (USACE) – June 26, 2018
F. Property Rights Acquisition and Mitigation Plan, version 4 (Diversion Authority) – August 13, 2018
G. Adaptive Management and Monitoring Plan (USACE) – July 2018
H. Plan B Dam Breach Assessment (USACE) – July 2018

i. **Alternatives Considered in the State FEIS and the Final SEIS**

47. Minnesota Statutes § 116D.04, requires the Responsible Governmental Unit (RGU)[1] to analyze all *appropriate alternatives* and feasible and prudent alternatives less environmentally intrusive than those alternatives that are likely to impair natural resources located within the state.

48. Minnesota Rules 4410.2300, G, requires the RGU to consider at least one alternative from each of the following categories: alternative sites; alternative technologies; modified design or layouts; modified scale or magnitude; and alternatives incorporating reasonable mitigation measures identified through comments received during EIS development. Alternatively, the RGU must explain why it has failed to explore alternatives within each of these categories. *Id*.

49. During each step of the EIS process for the Project (EIS scoping, Draft EIS, Final EIS, SEIS Scoping, Draft SEIS and Final SEIS), the DNR conducted a robust and independent assessment of potential project alternatives within the above categories. *See Alternatives Screening Report: Fargo-Moorhead Metropolitan Area Flood Risk Management Project (December 2012) (Alternatives Screening Report)*; State FEIS at Ch. 2, Apps. C and M; and Final SEIS at App. B. The Screening Reports completed for the State FEIS and Final SEIS were conducted in such a way that they each reevaluated previously proposed alternatives. In the Final SEIS, a total of 33 different alternatives were considered for full inclusion in the Final SEIS.

50. An alternative may be excluded from analysis if it will not meet the underlying need for or purpose of the Project; it will likely not have a significant environmental benefit compared to the Project as proposed; or another alternative, of any type, that will be analyzed in the EIS will likely have similar environmental benefits but substantially less adverse economic, employment, or socioeconomic impacts. Minn. R. 4410.2300, G.

51. Final SEIS Appendix B included the Alternatives Screening Report. For purposes of the screening, the DNR revised the Project purpose to include just one of the three purpose and need components described in ¶ 67. The one purpose and need component selected for the rescreening evaluation was 100-year flood accreditation. This report reconsidered all 29

[1] The RGU is the unit of government "responsible for preparation and review of environmental documents." Minn. R. 4410.0200, subp. 75.

previously-screened alternatives from the State FEIS, as well as four new alternatives brought forward during SEIS scoping, for a total of 33 alternatives. The 29 previously-screened alternatives were reconsidered using the updated POR hydrology to determine if they met the legal requirements to be included or excluded from full evaluation in the SEIS. In some cases, alternatives presented a readily apparent reason for being excluded. Other alternatives did not present a readily apparent reason for exclusion and, therefore; remained included and additional information was collected to analyze the alternative. This additional data on individual alternatives was analyzed and if, during the course of this analysis, it was determined that the alternative did not meet the requirements for further evaluation as set forth in Minn. R. 4410.2300, G, a determination was made that the alternative would not advance for further evaluation.

52. Throughout the entire EIS and SEIS process, there were four alternatives that did not present a readily apparent reason for exclusion during initial alternative screening. Thus, these alternatives remained included as viable alternatives until data revealed the alternative should indeed be excluded from further consideration based on the criteria set forth in Minn. R. 4410.2300, G. These four alternatives, including their descriptions, and, where applicable, the reasons for excluding them from further analysis, are:

a. The Distributed Storage Alternative (DSA): This alternative was screened in for full evaluation in the 2015 Draft EIS. The DSA included approximately 96 upstream retention sites, flood barriers, watershed flood storage, wetland/grassland restoration, and nonstructural measures. *See* State FEIS § 2.2.1.3. As more fully explained in ¶ 26 of the *Fargo-Moorhead Flood Risk Management EIS Record of Decision* (2016 ROD), following substantial analysis during development of the Draft EIS for the 2016 Project, it became apparent that the DSA was limited in its ability to meet the project purpose. Because this alternative failed to meet the project purpose, it was determined that the DSA was not a feasible or practical alternative to the 2016 Project due to the number of required retention sites. *See* State FEIS App. C. Therefore, pursuant to Minn. R. 4410.2300, G, the DSA was not advanced for further evaluation.

b. The Northern Alignment Alternative (NAA): The NAA involved shifting the Southern Embankment and control structures north from the 2016 Project's location. Flood inundation associated with the NAA would not impact as much land in Richland County, ND and Wilkin County, MN. However, lands north of the 2016 Project would potentially experience flood impacts under the NAA design. *See* State FEIS at § 2.2.2.2. The NAA was fully evaluated in the 2016 State FEIS, alongside the 2016 Project. *See* State FEIS Ch. 3. The NAA did not provide significant environmental and socioeconomic benefit over the 2016 Project.

c. Alternative 30: This alternative was proposed through public comment during SEIS Scoping. Alternative 30 was a modification of Plan B (the Revised Project) that involved a shift of the northwest Diversion Channel alignment and a northerly shift of Plan B's Southern Embankment alignment. Following substantial analysis during development of the SEIS, it became apparent that,

although Alternative 30 lowered the staging area elevation and removed the Maple River Aqueduct, it increased floodplain acreage in the northwest portion of the Project Area, required a second Sheyenne River crossing with greater environmental impact, and had greater negative stream stability impacts. Therefore, Alternative 30 was excluded from full analysis because it did not present significant environmental benefit compared to the proposed project. *See* State Final SEIS App. B. Therefore, pursuant to Minn. R. 4410.2300, G, Alternative 30 was not advanced for further evaluation.

Alternative 31: This alternative was proposed through public comment during SEIS Scoping. Alternative 31 was a modification of Plan B (Revised Project) that involved a northerly shift of Plan B's Southern Embankment alignment. Following substantial analysis during development of the SEIS, it became apparent that the environmental impacts of Alternative 31 were comparable to the environmental impacts of Plan B (the Revised Project). The costs associated with Alternative 31 were, however, greater than Plan B (the Revised Project), and Alternative 31 posed a greater risk to public safety. Because Alternative 31 had similar environmental effects, but had greater adverse socioeconomic impacts compared to Plan B (the Revised Project) it was excluded from further evaluation in accordance with the requirements of Minn. R. 4410.2300, G. *Id*.

53. In addition to the alternatives discussed in ¶¶ 47 through 54, the DNR also fully evaluated the 2016 Project. As more fully described in ¶ 20 the 2016 Project was a diversion channel system project designed to divert flood waters around the cities of Fargo and Moorhead and surrounding areas. The 2016 Project was fully analyzed in the 2016 State FEIS but could not be permitted by the DNR, in part because of its significant environmental and socio-economic impacts.

54. During the public comment period on the Draft SEIS, the DNR received public comments requesting reconsideration of Alternative 30 and Alternative 31, along with additional data on these two alternatives. As a result of these comments, the DNR reconsidered Alternatives 30 and 31. The DNR's reconsideration included additional modeling and analysis, and is included in a new section at the end of the Alternatives Screening Report. *See* Final SEIS Appendix B *Supplemental EIS Alternatives Screening Exercise Report.* The DNR reconsidered the alternatives using the criteria set out in Minn. R. 4410.2300, G. This re-analysis did not alter the DNR's conclusion that neither Alternative 30 nor Alternative 31 meet the requirements of Minn. R. 4410.2300, G and therefore, a further analysis of these alternatives was not advanced. *Id*.

ii. **Potential Environmental and Socio-economic Effects Identified in the State FEIS and the Final SEIS**

55. The State FEIS and Final SEIS contain detailed discussions of the Revised Project's known or potential environmental and social impacts. *See* State FEIS Ch. 3 and Final SEIS, Ch. 3. These discussions include the proposed monitoring and mitigation measures. ¶¶

134 through 139, ¶¶ 190 through 204, and ¶¶ 221through 232 contain a brief description of the analysis of the primary environmental and socioeconomic impacts.

56. Cold Weather Impacts. The Final SEIS indicates that the Revised Project will have the same cold weather impacts as the 2016 Project. *See* Final SEIS at § 3.1.1. The State FEIS identifies potential cold weather impacts to fish passage and biological connectivity as well as habitat and water quality. *See* State FEIS at § 3.5.

57. Cover Type. The Final SEIS indicates that the Revised Project will have the same cover type impacts as the 2016 Project. *See* Final SEIS at § 3.1.2. The State FEIS identifies the primary cover type impacts as being to croplands and wetlands, including both direct and indirect impacts. *See* State FEIS at § 3.6.

58. Potential Environmental Hazards. The Final SEIS indicates that the Revised Project will have the same potential environmental hazard impacts as the 2016 Project. *See* Final SEIS at § 3.1.3. The State FEIS identifies the potential for contamination impacts to parcels from construction, as well as from operation where Environmental Site Assessments (ESAs) have not been conducted. *See* State FEIS at § 3.7.

59. Listed and Special Status Species. The Final SEIS indicates that the Revised Project will have the same impacts to listed and special status species as the 2016 Project. *See* Final SEIS at § 3.1.4. The State FEIS indicates that the primary potential impacts occur to lake sturgeon (special concern), black sandshell (special concern), short-beaked arrowhead (endangered), burrowing owl (endangered) and the Garita Skipper (threatened). *See* State FEIS at § 3.10.2.

60. Invasive Species. The Final SEIS indicates that the Revised Project will have the same invasive species impacts as the 2016 Project. *See* Final SEIS at § 3.1.5. The Revised Project, like the 2016 Project, could encourage the establishment of invasive species populations at mitigation and construction sites as well as encourage spread and establishment of invasive species populations in the inundated areas following Revised Project operation. Construction could involve work in zebra-mussel infested waters that could spread zebra-mussels within the watershed. State FEIS § 3.11.2.

61. Hydrology and Hydraulics. The Revised Project will cause hydraulic changes to the Red River system compared to existing conditions. These impacts include the area, duration, and depth of floodwater inundation. The majority of these impacts will be realized in the upstream storage area. The total inundation within the Project Area during the POR 100-year flood will be 123,954 acres; of which 12,049 acres are on land that currently does not flood during a 100-year event. Hydrologic and Hydraulic modeling for project operation identifies increased flood levels downstream of the Fargo-Moorhead area. The largest downstream increase modeled for a 100-year event was 0.14 feet at Georgetown, Minnesota and the largest increase during a 500-year event was 0.58 feet at Grand Forks, North Dakota. Plan B includes an Eastern Tieback Embankment that will cross Wolverton Creek approximately two miles south of the city of Comstock, Minnesota. A non-gated culvert structure within the

Embankment would allow flow from Wolverton Creek to pass under the embankment. During the POR 100-year flood, there will be a small increase of 0.11 feet in water surface elevation immediately upstream of the Tieback Embankment. The Benefitted Area will see a reduction or elimination of inundation during most flood events. Local drainage could result in some isolated inundation within the Benefitted Area. The Revised Project will protect 56,882 acres from inundation that would be flooded under existing conditions. Hydrologic changes in the project area could impact a number of resources. *See* Final SEIS § 3.2.

62. FEMA Regulations. The areal extent of POR 100-year flood inundation required for the Revised Project operation in the storage area will be mapped as floodway. Any additional flood inundation area beyond the storage area but within the FEMA revision reach will be mapped as floodplain. A FEMA-approved Conditional Letter of Map Revision (CLOMR) is required. After Project completion, a Letter of Map Revision (LOMR) will be submitted. *See* Final SEIS § 3.3.

63. Wetlands. Construction and operation of the Revised Project will have direct and indirect impacts on open water, seasonal, wet meadow, shallow marsh and shrub-carr wetlands. *See* Final SEIS § 3.4. The State FEIS indicates that the 2016 Project was projected to impact approximately sixty-two acres of floodplain forest and approximately 1,750 acres of direct wetland impacts. *See* State FEIS at § 3.4.2. The Revised Project will have approximately 36 fewer acres of wetland impacts than the 2016 Project. *See* Final SEIS at § 3.4.2.1. This is primarily attributed to the relocation of the Southern Embankment. *Id*. Table 3-4 of the Final SEIS indicates that there is estimated to be approximately 1,716 acres of direct wetland impacts. *Id*. Additionally, approximately 124 acres of riparian and upland forest will be impacted by the Revised Project, a portion of which could be wetlands. *Id*. These forested areas have not been delineated. *Id*. Additionally, Table 3-6 of the Final SEIS indicates that 253.1 acres of wetland will be indirectly impacted from "new inundation" during a POR 100-year flood event. *Id*. Forty-seven acres of these newly inundated wetlands are in Minnesota.

64. Aquatic and Terrestrial Resources. Impacts to Aquatic and Terrestrial Resources include fish passage and biological connectivity, aquatic habitat, wildlife and wildlife habitat, and stream stability. The Revised Project will alter the natural flow of water through the floodway. Construction of the Revised Project will result in a loss of 46 total acres of aquatic habitat and abandonment of both Wild Rice River and Red River meander channels. *See* Final SEIS § 3.5.2.1.1. Specific impacts of the Revised Project are set forth below.

a. Construction of the Revised Project will result in channel abandonment of 2.7 miles of the Lower Rush River and 2.3 miles of the Rush River.

b. The Eastern Tieback will cross Wolverton Creek using three box culverts, each of which will be 10-feet wide. Wolverton Creek will then flow through the tieback into the area protected by the Revised Project. The Wolverton Creek Structure is approximately 85 feet long by 125 feet wide and will remove one acre of aquatic habitat from the stream.

c. Operation of the Revised Project could strand fish in the diversion channel and the storage area. *See* State FEIS § 3.8.2.

d. Water velocities through the Wild Rice River Control Structure, Red River Control Structure, and the Wolverton Creek Structure will increase during smaller flood events, when the diversion channel is not operating. These higher velocities will hinder fish passage through the structures/culvert. The structures could also limit biological connectivity by changing the riverine physical environment within each structure. *See* Final SEIS § 3.5.2.

e. The Revised Project will result in the loss of fish connectivity on the Red River and Wild Rice River during operation of the Revised Project control structure. These impacts will extend beyond these two river systems to other waterbodies within the Red River Basin. The Revised Project and its individual features will directly impact aquatic biota and habitat in the project area including impacts associated with the Maple and Sheyenne River aqueducts, and the Red River and Wild Rice River Control Structures. *See* Final SEIS § 3.5.2.1.

f. Changes in hydrology and inundation could alter the geomorphology, and result in overall stream instability. The loss of floodplain function downstream of the Southern Embankment would also adversely impact aquatic and terrestrial resources. *See* Final SEIS § 3.5.2.2.

g. The fish passage, biological connectivity, aquatic habitat, and macroinvertebrate impacts of the Revised Project Diversion Channel and OHB levee are not anticipated to be substantially different. *See* Final SEIS at § 3.5.2.1.

h. The Revised Project's impacts to wildlife and wildlife habitat are not anticipated to be substantially different. The State FEIS described direct impacts during construction, including direct mortality, displacement or increased exposure of less mobile species to predators. Temporary impacts would primarily include displacement, increased noise and visual disturbances. Impacts to floodplain forest would result in the most immediate and longest temporal loss to habitat function. Wildlife using the Diversion Channel could also experience mortality and displacement due to a sudden surge of water entering. There is potential for indirect impacts to migratory species that use the Project Area. *See* State FEIS § 3.9.2 and Table 5.1.

65. Infrastructure. The Revised Project will impact roads, bridges, culverts, ditches and water treatment plants, as well as change traffic patterns. *See* Final SEIS § 3.7.2.

66. Socioeconomic Impacts. The State FEIS contains extensive discussions of the 2016 Project's potential socioeconomic impacts that include: project construction and/or operation flood impacts to residential and nonresidential structures, including public infrastructure upstream of the dam; Project construction and/or operation impacts to agricultural land, including organic farms; Project construction and/or operation impacts to businesses,

including agricultural businesses upstream of the dam; Project construction and/or operation impacts to public services; Project operation impacts to uninsurable structures and grain/livestock food storage; and Project construction and/or operation impacts to cemeteries. *See* State FEIS § 3.16.2 and Final SEIS § 3.10.2. The Revised Project will impact 5 cemeteries upstream of the Southern Embankment. *See* Final SEIS § 3.10.2.1.2.

IV. REVISED PROJECT DESCRIPTION INCLUDING DAM LOCATIONS, CONSTRUCTION, OPERATION AND WORK IN PUBLIC WATERS

67. The Revised Project is a diversion channel system project designed to reduce flood risk, flood damages, and flood protection costs related to flooding in the F-M metropolitan area. The Revised Project is designed to protect the F-M metropolitan area from a flood event in excess of a 500-year flood. To the extent technically and fiscally feasible, the Revised Project will perform the following functions:

a. Reduce flood risk potential associated with a long history of frequent flooding on local streams including the Red River, Sheyenne, Wild Rice (North Dakota), Maple, Rush and Lower Rush Rivers passing through or into the F-M metropolitan area.
b. Qualify substantial portions of the F-M metropolitan area within the 100-year floodplain for FEMA accreditation (i.e., these areas would meet the standard to be shown on Flood Insurance Rate Maps as having protection from a 100-year event) under the National Flood Insurance Program.
c. Reduce flood damage risk from floods exceeding the 100-year flood, given the importance of the F-M metropolitan area to the region and recent frequencies of large scale flood events.

See 2018 Application at 2.

68. The project area for the Revised Project consists of an approximately 20 mile by 40 mile area and encompasses the entire F-M metropolitan area, as well as the site of the Revised Project components and inundation impacts (Project Area). *See* Attachment 1. The Project Area is intended to capture the area that would be directly impacted by the Revised Project.

69. DNR's analysis indicates that existing flood risk reduction measures, in combination with emergency measures, currently provide flood protection over the POR 100-year flood event in developed areas. Therefore, the additional benefits that would be provided by the Revised Project over the No Action with Emergency Measures are:

a. The reduction in the need for flood insurance among property owners in the 100-year floodplain with federally backed mortgages.
b. A reduction or elimination in emergency measures required for flood protection during the POR 100 year event in F-M metropolitan area.
c. Flood protection for the F-M metropolitan area during flooding events in excess of the POR 100-year flood event.

d. Provides a buffer for addressing future flood risk management needs associated with climate change and land use changes in the Red River Valley.
e. The protection of what is currently sparsely developed rural property for future development.

70. Portions of the Revised Project in Minnesota include: eight miles of dam embankment and tieback embankment; the Red River Control Structure; the Wolverton Creek Structure; portions of the staging area; levees and floodwalls; non-structural features; recreational features; and environmental mitigation projects. Additional project features in North Dakota include: 12 miles of dam embankment and tieback embankment; the Wild Rice River Control Structure; the Diversion Inlet Control Structure; aqueducts; an approximately 30-mile-long diversion channel; portions of the staging area; levees and floodwalls; non-structural features; recreational features; and environmental mitigation projects. *See* 2018 Application.

71. The Final SEIS clarifies the following Project components including the Dam, Control Structures, Culvert Structures and Embankments. (*See* Attachment 1):

a. Dam: A dam is any artificial barrier, together with required components, capable of impounding water, typically with a height greater than six feet and a storage capacity in excess of 15-acre feet. Minn. R. 6115.0320, subp. 5. For purposes of the Revised Project, the Dam collectively includes the Diversion Inlet Control Structure, Wild Rice River Control Structure, Red River Control Structure, Wolverton Creek Structure, the Western Tieback Embankment, the Southern Embankment, and the Eastern Tieback Embankment. *See* Final SEIS §§ 2.1.1.1.
b. Control Structures: Minnesota Rule 6115.0170, subp. 42 defines a water level control structure as "any structure which impounds or regulates the water surface elevation or flow of public waters including dams." For purposes of the Revised Project, the term water control structure includes three gated control structures: (1) the Wild Rice River Control Structure; (2) the Red River Control Structure; and (3) the Diversion Inlet Control Structure. *See* Final SEIS §§ 2.1.1.2, 2.1.1.4, and 2.1.1.9.
c. Culvert Structures. The Revised Project includes the Wolverton Creek Structure, which is a non-gated culvert structure that will carry the waters of Wolverton Creek under the constructed Eastern Tieback Embankment. *Id*.
d. Embankment: An embankment is a mound of earthen material, typically created by placing and compacting soil, sand, clay and/or rock, to form a barrier to water seepage. Embankments can be used to form dams or to form walls on the outside of man-made water channels. The Revised Project includes the Western Tieback Embankment, the Southern Embankment, and the Eastern Tieback Embankment. *See* Final SEIS § 2.1.1.1.

72. A key component of the Revised Project is the area upstream of the Red River and Wild Rice control structures that will be used to store flood waters when the Revised Project is fully operational. This area is the storage area. *See* Attachment 2.

73. The storage area includes an approximate 28,000-acre land management area immediately upstream of the Dam intended to store flood waters. The storage area includes that area where the Revised Project will increase the 100-year or 500-year flood water surface elevation by one foot or more over existing conditions. In many portions of the storage area, flood depths would increase by six feet or more in the 100-year flood.

74. In a 100-year flood event, operation of the Revised Project will increase the depth and duration of flooding over existing conditions in portions of the Project Area. It is estimated that approximately 12,049 acres of land that does not currently receive flood waters would be newly inundated. *See* Final SEIS at § 2.1.

75. The geographic reach of the Revised Project in Minnesota, including the storage area, includes at least a portion of Georgetown, Glyndon, Holy Cross, Kragnes, Kurtz, Moorhead, Oakport and Wolverton Townships; the City of Moorhead; Clay County and Wilkin County; and the BRRWD. The Dam and storage area primarily impacts Holy Cross Township in Clay County and Wolverton Township in Wilkin County. Many of these LGUs have the legal authority to exercise regulatory controls within their jurisdictional boundaries. None of these LGUs have land use control over the entire geographic reach of the proposed Project, but each has jurisdictional authority over activities that occur within their jurisdictional boundaries. The geographic reach of the Revised Project is set out more specifically in Attachment 1.

76. The Revised Project's Red River Control Structure location is approximately 11 miles south of the City of Moorhead. It will consist of three gates, each of which is 50 feet in width constructed off the Red River channel. The Red River will then be realigned to flow through the Red River Control Structure. Construction of the Red River Control Structure requires the placement of fill in, and the excavation of material from, the channel of the Red River below the ordinary high water level (OHW). This fill and excavation will physically affect approximately 5.5 acres of the Red River. Additionally, construction of the Red River Control Structure will result in the abandonment of approximately 8 acres of existing Red River channel. *See* 2018 Application at 5.

77. The Revised Project dam embankment is an earthen structure. The average height of the embankment is 20 feet. The width of the embankment at its top averages fifteen feet and has 4:1 slopes (four feet horizontal to 1 foot vertical). The height of the dam portion of the Red River Control Structure will be 54.5 feet. The top of the Dam will sit at 928.5 feet (vertical datum North American Vertical Datum of 1988 (NAVD 1988)).[2] 2018 Application. *See* Attachment 1.

[2] Minnesota Rule 6115.0320, subp. 7 defines a dam's height as the vertical distance from the natural stream bed measured at the downstream toe of the dam.

78. The Eastern Tieback Embankment will cross Wolverton Creek approximately two miles south of the City of Comstock, Minnesota. A non-gated culvert structure will be placed within this Eastern Tieback Embankment to permit Wolverton Creek to flow through the embankment. The culvert structure consists of three box culverts, each of which will be ten-feet wide. *See* Preliminary Design Report. Construction of the Wolverton Creek Structure will require the placement of fill in 1.2 acres of Wolverton Creek below the OHW and the excavation of material in 0.5 acres of Wolverton Creek's channel. *See* 2018 Permit Application.

79. The design of the Eastern Tieback Embankment and the Wolverton Creek Structure is intended to prevent Project flows from exceeding existing condition flows in Comstock, Minnesota through the Probable Maximum Flood (PMF). A PMF is the largest flood that could conceivably occur at a particular location. The PMF in an extreme flood event that is off the normal flood frequency charts, so no return interval can be assigned. The PMF for the Revised Project is approximately 205,000 cubic feet per second (cfs). The Dam is designed to safely pass the PMF (design flood event) without exceeding a pool elevation of 923.5 feet at the Dam. The Dam has a maximum flow capacity of 205,000 cfs, so the PMF for the Revised Project is also referred to as the maximum capacity event.

80. The Revised Project will be constructed over a period of approximately ten years. The first phase of construction in Minnesota will be construction of the Red River Control Structure. The final plans and specifications for the Red River Control Structure will be completed in 2020. Final design is complete for the Diversion Inlet Control Structure in North Dakota. Prior to imposition of the preliminary injunction on the 2016 Project, the Diversion Authority and USACE had commenced earthwork for the Diversion Inlet Control Structure. This work was halted in 2017 in conformance with the preliminary injunction. The Revised Project anticipates using substantially the same inlet structure at the same location. Design of the Wild Rice River Control Structure is currently in process and is at least 65% complete. *See* 2018 Permit Application, Attachment 5 in the 2018 Permit Application.

81. Within the Project Area, under existing conditions for the POR 100-year flood event, Minnesota experiences 23% of the inundation and North Dakota experiences 77%. For the POR 100-year flood event, the Revised Project will remove 47,247 acres from flooding in North Dakota. North Dakota receives 83% of the Revised Project benefits. The total newly inundated acres in North Dakota is 8,374 acres; which results in a net reduction of 38,873 inundated acres from the 2016 Project. In the event of a 100-year flood, 17% of the total Revised Project benefits are within Minnesota. These benefits accrue to approximately 9,635 acres. The total newly inundated acres in Minnesota are 3,677; which results in a net reduction of 5,958 inundated acres. *See* Final SEIS at § 3.10.2.1 and Attachment 3.

82. As designed, the Revised Project will protect the F-M metropolitan area beyond the POR 500-year flood event. In a 500-year flood event, the Project will benefit 64,193 acres in North Dakota and will flood 5,443 acres that are not being flooded under existing conditions, resulting in a net reduction of flooded acreage of 58,750 acres. In a 500-year flood, the Project will also benefit 16,477 acres in Minnesota and will flood 1,471 acres that are not flooded under existing conditions, resulting in a net reduction of flooded acreage of 15,006 acres. For a 500-

year event, North Dakota would receive 80% of the net flood reduction compared to Minnesota, which would receive a 20% net reduction in flooded acres. *See* Attachment 6 500 Year Event With and Without Revised Project.

83. The estimated cost of the Revised Project is $2.75 billion. *See*, https://www.fmdiversion.com/about-the-project/how-is-it-funded/.

84. Federal cost sharing for the Revised Project will be based on the 2016 FCP. The federal government has, thus far, committed to paying $450 million (approximately 17%) of the project. However, recent news articles indicate that the federal government will be asked to contribute an additional $300 million, which would increase the federal share of the Revised Project construction cost to 27%. *See*, https://www.fmdiversion.com/about-the-project/how-is-it-funded/. Because the Revised Project would be operated and maintained by the Diversion Authority, there is no ongoing federal contribution for operation or maintenance.

85. The Diversion Authority will own, operate, and maintain the proposed Project and is the local project sponsor for the Revised Project. Assuming the federal funding for the project is increased to $750 million, the Diversion Authority and its individual members would be responsible for 73% of the currently estimated project construction costs and for funding all of the Revised Project mitigation and future operation and maintenance. The Diversion Authority and its members are seeking construction funding contributions from the States of Minnesota and North Dakota but remain primarily responsible for construction costs. *See* https://www.fmdiversion.com/about-the-project/how-is-it-funded/.

86. The Diversion Authority membership will raise construction, mitigation, and operation and maintenance funds by levying sales taxes, maintenance district taxes, or a combination thereof within their individual jurisdictions. *See* Final SEIS § 3.8.3.1. Two other sources of revenue for operation and maintenance include a maintenance tax levied by the Cass County (ND) Joint Water Resources District and a Storm Water Maintenance Fee levied by the City of Moorhead. *See* Final SEIS § 3.8.3.1. Monies raised by the LGUs would be remitted to the Diversion Authority to construct, operate, and maintain the Dam and to finance mitigation measures. *Id*.

87. The individual members of the Diversion Authority have yet to provide full funding for the remaining construction, mitigation, and operation and maintenance costs for the Revised Project.

88. An Operation Plan is being prepared by the USACE that will provide a summary of water control management activities associated with the Revised Project. The Operation Plan was not complete at the time of Final SEIS publication, but information was available on operation assumptions used in project design. *See* Final SEIS § 2.1.1.14

89. The Red River and Wild Rice River control structure gates will remain fully open unless information from upstream USGS gages indicate that the stage at the USGS gage in Fargo will exceed 37.0 feet. When gage levels above 37.0 feet are forecast, the gates will be partially

closed at both control structures, thereby limiting flows downstream in the natural channels and causing the water to accumulate in the storage area upstream of the Dam embankment. The Diversion Inlet Control Structure will be closed when the storage area begins to fill. *Id*

90. At the 37.0 foot stage, the flow through Fargo will be approximately 21,000 cfs, approximately a five-percent chance flood (i.e., 20-year flood). Based on historical gage data, the Revised Project would have operated five times since 1969. *See* Final SEIS § 3.5.2.1.2.

91. The operation plan for the Diversion Inlet Control Structure is based on an algorithm that considers the flow through the Wild Rice, Red River, and Diversion Inlet control structures; flow in six rivers (Red, Wild Rice, Sheyenne, Maple, and Rush Rivers and Wolverton Creek); and operational limits. Operational limits include flow through town, downstream flows, and storage area pool elevations. Maximum discharges, elevations and rates of change are considered in the operational limits. *See* Final SEIS § 3.2.2.1

92. When combined flows on the Red River and Wild Rice River are between 21,000 cfs (approximately 20-year flood event) and 39,000 cfs (greater than the 100-year event), approximately 21,000 cfs (37.0 feet at Fargo gage) would flow in the Red River through the F-M Metropolitan Area, up to 20,000 cfs will flow in the Diversion Channel, and the elevation of the storage area at the control structure will not exceed 921.0 NAVD. *Id*

93. When the upstream USGS gages show the combined Red River and Wild Rice River flows upstream of Fargo are between 39,000 cfs (greater than the 100-year flood event) and 66,000 cfs (approximately the 500-year flood event), the target flows in the Red River through the F-M Metropolitan Area would be between 21,000 cfs and 27,000 cfs (37.0 feet and 40.0 feet respectively at the Fargo gage). Flow through the Diversion Inlet Control Structure into the Diversion Channel would be between 20,000 cfs and 25,000 cfs. *See* Final SEIS § 3.2.2.1.

94. When combined flows are above 66,000 cfs (approximately the 500-year flood event), the gate flow algorithm would no longer apply. The flow in the Red River through the F-M Metropolitan would be maintained to limit river stage to 40.0 feet at the Fargo gage. Flow into the Diversion Channel could exceed 25,000 cfs to maintain the 40.0 feet at the Fargo gage and maintain a maximum surface water elevation in the storage area of 923.5 feet for as long as possible. An evacuation order would be issued for areas downstream of the Dam as the pool in the storage area approaches 923.5 feet according to the required contingency action, see Permit condition 28. The Red River Control Structure and Wild Rice River Control Structure gates would be opened to maintain the surface water elevation of 923.5 feet in the storage area, allowing flow in the Red River through the Benefited Area to exceed 40.0 feet at the Fargo gage when flows exceed 90,000 cfs. Once flows exceed 90,000 cfs (approximately the 1,000-year event), the river stages in town will increase above a stage of 40.0 feet. *See* Final SEIS § 3.2.2.1.

95. After the flood peak has passed and the pool begins to be drawn down after project operation, the Red River Control Structure and Wild Rice River Control Structure gate

opening changes would be limited to ensure the rate of stage fall in the storage area is no more than 2 feet per day, which is the historically-observed rate at USGS gage 05051522 – Red River of the North at Hickson, ND. This operational limitation is intended to limit stream bank instability and fish stranding within the storage area. *Id*

96. The 2016 Project would have started operation at 17,000 cfs (i.e. the 10-year flood), allowing 17,000 cfs through town and filling in the storage area up to elevation of 922.2 NAVD during the 100-year flood. The Diversion Channel Inlet structure gates would have opened after the flow peaks from the Sheyenne, Maple, Rush, and Lower Rush passed through the Diversion Channel. If the forecasted flow at the Fargo gage would exceed 34,700 cfs, the flow through the Wild Rice and Red River Control Structures would have increased to 27,000 cfs (40.0 gage stage) and through the Diversion Channel Inlet Structure would have increased to 20,000 cfs. The pool elevation would have been maintained at 922.2 NAVD through the 500-year event. *See* State FEIS Project Description.

97. Additionally, changes to regulatory floodways, Base Flood Elevations (BFEs) or extents of Special Flood Hazard Areas (SFHAs) caused by the construction and operation of the proposed Revised Project require updates to the existing Flood Insurance Study Map. The National Flood Insurance Program (NFIP) participating communities with existing Flood Insurance Rate Maps (FIRM) affected by the Project would require FIRM revisions pursuant to the FEMA Letter of Map Revision process and in accordance with the Final FEMA/USACE Coordination Plan. 44 CFR 65.6-65.7, *see also* State FEIS §§ 1.5 and 3.2 and App. F.

98. The proposed Project would increase flooding in the Unbenefited Area. The Unbenefited Area is that area upstream of the Dam that would be flooded during operation of the Revised Project. The potential for increased flooding in the Unbenefited Area as a result of operation of the Revised Project has the potential to restrict development and/or land use options in the Unbenefited Area. *See* Final SEIS § 3.10.2, Figure 2.

99. The Revised Project requires a number of governmental approvals including, but not limited to, the following Minnesota state-level permits and approvals: a public waters work permit, a dam safety permit, a water appropriations permit, a burning permit, an infested waters permit, an invasive species permit, a Section 401 Clean Water Act Certification, a cooperative construction agreement, a national pollution and discharge elimination systems permit, and a National Historic Preservation Act section 106 approval. *See* Final SEIS at Table 1-1 (which includes a summary of all federal, state, and local government approvals required for the Revised Project).

V. PERMIT APPLICATION AND COMMENT PROCESS

A. Permit Applicant and Application

100. On March 16, 2018, the Diversion Authority, the City of Fargo, the City of Moorhead and the USACE (hereinafter collectively referred to as Permit Applicants) submitted a combined Dam Safety and Public Waters Work permit application together with attachments for the Revised Project through DNR's MPARS system. (2018 Application). The permit application filed on March 16, 2018 was for the required dam safety permit and work in public waters in the Red River. *See* 2018 Application.

101. On June 4, 2018, the Permit Applicants filed an amended permit application that included the construction of a new crossing and culvert structure at Wolverton Creek. (The March 16 permit application and the June 4, 2018 amendment thereto are hereinafter referred to collectively as the 2018 Application). *See* ¶ 70 and ¶ 78. (Containing a description of the Wolverton Creek Structure).

102. A permit application fee of $1,000 was remitted to the DNR on April 17, 2018.

103. The 2018 Application explains that the Permit Applicants intend to construct, manage, maintain, and operate a flood risk management project that includes the construction of an earthen dam embankment and control structure in the Red River, the development of a flood water storage area upstream of the Dam, the channelization and realignment of the Red River and the placement of an earthen berm with three box culverts across Wolverton Creek. *See* 2018 Application. A more complete description of the Revised Project for which the dam safety and public waters work permit is found in ¶¶ 67 through ¶¶ 99.

104. The Revised Project purpose and need as set forth in the 2018 Application is "to reduce flood risk, flood damages, and flood protection costs related to flooding in the F-M metropolitan area." *See* 2018 Application.

105. The 2018 Application further explains that, to the extent technically and fiscally feasible, the Revised Project will:

a. Reduce flood risk potential associated with a long history of frequent flooding on local streams including the Red River, Sheyenne, Wild Rice (North Dakota), Maple, Rush and Lower Rush Rivers passing through or into the F-M metropolitan area.
b. Qualify substantial portions of the F-M metropolitan area within the 100-year floodplain for FEMA accreditation (i.e., these areas would meet the standard to be shown on Flood Insurance Rate Maps as having protection from a 100-year event) under the National Flood Insurance Program.
c. Reduce flood damage risk from floods exceeding the 100-year flood, given the importance of the F-M metropolitan area to the region and recent frequencies of large scale flood events.

This need statement parallels the need statement set forth in the Final SEIS. *See* Final SEIS at § 1.4.

106. On April 16, 2018, the applicant submitted Channelization/Realignment information on the realignment of the Red River and on June 4, 2018, submitted additional information on the Wolverton Creek Structure. *See* 2018 Application.

107. The 2018 Application identifies the parties associated with the Permit Application and includes the following information:

a. A description of the Dam Safety – Construction Site (Activity 1).
b. Channelization and Realignment Site Details.
c. Wolverton Creek Structure
d. A statement of the purpose of and need for the Revised Project.
e. A brief description of mitigation plans the Revised Project.
f. A description of two alternatives to the Revised Project together with a rationale for selecting the Revised Project. This section references the 2011 FFREIS and the State FEIS alternatives discussions.
g. A description of the impact of the Revised Project on waterbodies.
h. Technical design details for the Dam, the Red River realignment, and the Wolverton Creek Structure components of the Revised Project.
i. An application cover letter.
j. A preliminary design report.

108. On April 27, 2018, DNR sent a letter to the Permit Applicants, informing them that, as outlined in ¶ 31, the DNR would need to prepare a supplemental environmental impact statement for the Revised Project that was the subject of the 2018 Application. Letter to Michael Redlinger from Julie Ekman, Manager Conservation Assistance & Regulation Section (April 27, 2018) (April 2018 letter). The DNR also requested that, prior to the DNR circulating the 2018 Application to LGUs for review as required by Minn. Stat. § 103G.301, subd. 7, the Permit Applicants submit the additional information contained in Attachment 5 - April 2018 letter.

109. The Permit Applicants submitted the information requested in Attachment 5 in a series of submittals uploaded in MPARS between May and June of 2018.

B. The DNR Circulated the Permit Application for Comments and Responses from LGUs and Other Government Entities

110. In accordance with the requirements of Minn. Stat. § 103G.301, subd. 6 and 7 and Minn. R. 6115.0250, subp. 2, on June 5, 2018, the DNR requested comments within 30 days on the 2018 Application from (1) Clay County Soil and Water Conservation District (SWCD), (2) the United States Army Corps of Engineers (USACE), (3) the DNR Division of Fish and Wildlife ("FAW"), (4) the DNR Division of Ecological and Water Resources ("EWR"), (5) the Buffalo-Red River Watershed District (BRRWD), (6) Clay County, (7) Board of Water and Soil Resources (BWSR), (8) Wilkin County SWCD, (9) Wilkin County, (10) the City of Comstock, (11) the City of Moorhead, (12), the Minnesota Department of Transportation (MNDOT), (13) the Minnesota Pollution Control Agency (MPCA), (14) Kurtz Township, (15) Moorhead Township, (16) the City of Oxbow, (17) the City of Fargo, (18) the City of West Fargo, (19) the

City of Horace, (20) the City of Argusville, (21) the North Dakota Game and Fish Department (NDGF), (22) the North Dakota Department of Health, (23) Mapleton Township, (24) Pleasant Township, (25) Harwood Township, (25) Warren Township, (26) the Cass County Joint Water Resource District (WRD), (27) Cass County Soil and Water Conservation District (SWCD), (28) Cass County, (29) Richland County Water Resource Board, (30) Richland County SWCD, (31) the North Dakota Department of Transportation (NDDOT), (32) the City of Dilworth, (33) the City of Wolverton. *See* Minn. Stat. § 103G.301, subd. 7.

111. The BRRWD, the DNR FAW, the DNR EWR, Wilkin County and Richland County Water Resources District (WRD) provided responses to the DNR's request for comments on the 2018 Application.

112. In addition to the comments received by governmental agencies on the 2018 Application, the DNR also received comments from a non-profit organization called the Richland-Wilkin Joint Powers Authority (JPA). The JPA is a joint powers entity whose membership includes the counties of Richland, North Dakota and Wilkin, Minnesota, and various North Dakota and Minnesota townships as well as private residents from both states.

113. The DNR also received comments on the Permit Application from a North Dakota resident.

a. Concerns that the 2018 Application is premature

114. Several commenters expressed concerns that the 2018 Application materials were not final nor complete. The commenters contend that the project details are still being developed and are changing with time. In addition, the commenters contend that the Revised Project has not been developed in sufficient detail to warrant a permit.

115. Commenters noted concerns that the Permit Applicants have provided inadequate information for the Wolverton Creek area. The commenters cannot discern how the Wolverton Creek Structure will be managed when the Revised Project is operational. In addition, the commenters contend that they do not have adequate information to understand the impacts of the Revised Project on the Wolverton Creek.

116. DNR EWR expressed the need to see design details on structures and structure openings, associated rip-rap, baffles, and wing walls to determine project impacts. In addition, they suggested obtaining additional details on structure invert elevations, structure drawings, and longitudinal profiles of the rivers near the control structures.

117. DNR FAW requested a final operation plan for the Revised Project prior to project construction, as well as more details on monitoring and adaptive management to mitigate impacts of the Revised Project. Commenters contend that without greater detail and a binding commitment on the operation and monitoring plans, the impacts of the Revised Project cannot be fully evaluated and future changes could result in additional impacts.

118. As set forth in the 2018 Application, the Permit Applicants propose to address the concerns raised by the commenters regarding the expressed lack of detail and information through a phased permitting approval process. Design details are still being developed and will be provided through the permitting process as they are developed. The Permit Applicants provided additional details on the operation of the Revised Project in its November 15, 2018 preliminary design report. *See* Permit Application at 5.

119. Attachment 5 of the 2018 Application provides that the Revised Project will be constructed over a period of approximately ten years. The current construction schedule for the Dam includes six separate construction features, which will be designed and constructed in stages. Each feature of the Dam will have a detailed set of plans and specifications developed prior to construction and will require the acquisition of property interests prior to construction. Final detailed plans, specifications, and land acquisition have been completed for the Diversion Inlet Control Structure and submitted to the DNR. *See* 2018 Permit Application Attachment 8.

120. In some instances, where a permittee has adequately addressed the core requirements related to public health, safety, and welfare, and presented a minimal impact solution, the DNR will consider conditional approval of portions of a project prior to submission of a final design report.

121. Phased approval for large dam structures is expressly authorized by Minn. R. 6115.0410, subp. 9 and in particular subpart 9A (3) through (5). This phased approval is necessary when permitting dams with long-term continuous construction. This approach allows additional data and new technologies to be incorporated into the design and construction to maximize public health, safety and welfare. For example, the final development of a dam design might be adjusted based on additional information developed as part of further site investigations, materials testing, or other site-related activities. In particular, assuring long-term protection of health, safety, public welfare, and the environment requires developing new information over time and adapting post-permitting activities to on-site conditions.

122. DNR's dam safety regulations provide the flexibility to adjust DNR's directives to fit the conditions of the project and to meet its regulatory obligations even after a permit is issued. As information about the site, project implementation, environmental conditions, or other factors may change, or as additional details are developed, DNR has the ability to adjust requirements to ensure dam integrity and stability, and, in turn, protect public health and safety and the environment. DNR's permitting authority provides the means to continue to impose whatever requirements may be necessary over time to assure compliance with all applicable regulations. *See* e.g., Minn. R. 6115.0410, subp. 9(A)(2) (addressing alteration, modifications, additions to approved designs, plans, and specifications); subp. 9(A)(4) (if the "commissioner finds that changes are necessary to protect health, safety, welfare, and the environment, the commissioner shall order the owner to revise designs, plans, and specifications."); subp. 12

(providing for impoundment approvals to be issued at future stages of project); Minn. R. 6115.0500 (permit may be canceled or modified at any time if deemed necessary for protection of public interests; if DNR determines a dam is unsafe or needs repair or alteration, DNR shall notify owner to make the repairs or alterations, or to remove the dam as required).

123. As with many aspects of the design and construction of a project of this size and complexity, approval of various aspects of dam design and construction involves an iterative process between the permitting authority and the applicant. This process does not and should not stop at the moment the permit is issued. As additional information becomes available, the DNR may require further information or impose additional requirements. The DNR may require design modifications if necessary to meet regulatory requirements. Minnesota Rule 6115.0410, subp. 12 allows for impoundment approvals for various stages of construction.

124. The Permit for the Revised Project includes specifically provides for phased approval of permit conditions intended to address the concerns set forth in ¶¶ 114 through 123. *See* Permit conditions 18, 22, 31, 32, 37, and 43.

b. Concerns that the Permit Applicants have not adequately communicated and engaged with surrounding communities in the area.

125. Commenters expressed concerns that the Permit Applicants have not met with affected landowners to discuss the design of the Revised Project. They also expressed concerns that the Permit Applicants have not made sufficient effort to work with impacted communities to identify and mitigate impacts, and engineer solutions.

126. Commenters contend that there are major unresolved features of this plan, and that features impacting Richland and Wilkin counties continue to be contemplated without the involvement of the counties or the BRRWD.

127. Richland and Wilkin counties expressed concerns that they are being asked to comment on the "…unilaterally selected plan before issuance of the supplemental environmental impact statement is complete. While JPA appreciates the opportunity to comment, the purpose of the environmental impact statement is to provide all governmental entities information that they need to consider their own regulatory decisions." *See* Letter from G. Von Korff submitted on behalf of Wilkin and the JPA (July 6, 2018).

128. The Richland County Water Resource District (WRD) expressed concerns that the Permit Applicants have not made an effort to work with impacted entities to identify and mitigate impacts, and engineer solutions. It also contends that the Permit Applicants have not initiated permit reviews with local and regional permitting authorities.

129. The Permit Applicants and several LGUs in the project area were represented on the Governors' Task Force where the Plan B concept was developed. The members of the Task

Force were: Del Rae Williams, Mayor, Moorhead; Heidi Durand, Council Member, Moorhead; Joel Paulsen, Council Member, Moorhead; Jenny Mongeau, Clay County Commissioner; Tim Fox, former Wilkin County attorney; Mark Anderson, Treasurer, Buffalo-Red River Watershed District; Curt Johannsen, Mayor, Hendrum; Steve Jacobson, Norman County Commissioner; Jason Benson, Cass County Engineer; Rob Bergan, Fargo Business Leader and Entrepreneur; Nathan Berseth, Richland County Commissioner; Bernie Dardis, Board Chair of Greater North Dakota Chamber of Commerce; Craig Hertsgaard, farmer, Richland County; Tami Norgard, Vogel Law Firm; John Strand, Fargo City Commissioner; Ken Vein, City Council Member, Grand Forks. *See* Task Force Report at 1-2.

130. As set forth in greater detail in ¶ 28, the purpose of the Governors' Task Force was to develop design principles and concept-level engineering solutions for flood risk management considering the needs of the F-M metropolitan area and downstream and upstream communities and properties.

131. The Governors' Task Force committee members reached consensus that enhanced flood risk reduction was needed for the F-M metropolitan area. The Task Force Report indicates that consensus was reached to use the POR hydrology, design for a stage of 37.0 feet in town for the 100-year event, do not allow any downstream impact at the Canadian border, and incorporate the proposed Plan B tieback locations for a revised project. *See* Task Force Report at 2-3.

132. As described in ¶ 29, the Governors' Task Force requested that the Technical Advisory Committee/Group continue its work to refine the concept design consistent with fundamental principles agreed to by the Governors' Task Force members. *Id*. The Technical Advisory Committee/Group was expanded to include a representative from the USACE and an engineer representing the JPA.

133. The Permit Applicants met with 25 LGUs after the Technical Advisory Committee/Group completed its discussions. The majority of the meetings were after the submission of the Permit Application. The Permit Applicants provided the DNR with a list of meeting dates and attendees, but the content of the meetings was not provided to the DNR. Nor did the Permit Applicants describe adjustments to the Plan B design/Revised Project or operation made in response to the meetings with LGUs. *See* USACE *Draft Supplemental Environmental Assessment #2: Modifications to the Fargo Moorhead Metropolitan Area Flood Risk Management Project*, at 60.3 (August 2018) (2018 Draft SEA #2).

c. Concerns with water quality

134. DNR received a comment from the DNR's Division of Ecological and Water Resources that the design of the culverts on Wolverton Creek appear to be undersized. Undersized culverts will restrict flow during mildly high water periods. Restricting flow will have an impact on stream function, causing aggradation upstream and scour downstream.

135. The BRRWD commented that bank failure and erosion from operation of the Revised Project could impede the BRRWD goals and policies for water quality.

136. The Final SEIS (Table 6.1) lists stream stability as an impact and recommends that Wolverton Creek be added to the stream stability monitoring program.

137. The Permit Applicants indicate that the Red River Control Structure and the Wolverton Creek Structure will convey flows as altered by the Revised Project. The Permit Applicants argue that both structures can handle the Revised Project design flows without resulting in substantial flows in downstream areas. A detailed design for these control structures, including scour analysis, has not yet been completed, so new downstream erosion hazards are unknown. *See* 2018 Application Attachment 11: Hydrology and Hydraulics Report.

138. As set forth in the Adaptive Management and Monitoring Plan (AMMP), the Permit Applicants propose monitoring and unspecified mitigation to address the stream stability impacts. *See* Final SEIS, Appendix G.

139. The DNR agrees that monitoring potential areas of downstream erosion must be required to address potential impacts to water quality and stream stability. Permit conditions 31, 32, and 44 require submittal and approval of final design and plans, identification of potential areas of downstream erosion, required monitoring, and measures to control the erosion predicted to result from the Revised Project Operation.

d. Concerns that the Permit Applicants have not adequately addressed the Wolverton Creek Structure.

140. Commenters expressed concerns that the 2018 Application provided inadequate information regarding the Wolverton Creek Structure. Commenters noted concerns that the Revised Project's proposed tie-back levee will cross Wolverton Creek and will interfere with the BRRWD's Wolverton Creek Restoration and Sediment Reduction Project.

141. Commenters also suggested that the Revised Project should avoid or minimize impacts to Wolverton Creek, and recommended proper sizing and alignment, low flow culverts, compliance with Minnesota Department of Transportation (MnDOT) bridge and general permit standards, and provision of improved tables and figures.

142. As currently proposed, the Eastern Tieback Embankment and Wolverton Creek Structure are located just north of the 180th Ave South road crossing. Due to the restriction in Wolverton Creek and associated increased velocities through the culvert, the Eastern Tieback Embankment poses a significant potential impact to fish and aquatic organism passage. This proposed alignment presents additional stressors to aquatic organisms already experiencing passage difficulties with other road crossings. The proximity of the proposed Eastern Tieback

Embankment to the road crossing at 180th Ave. South is of particular concern for cumulative impacts to biological connectivity and fish passage. Fish may be able to pass high velocities for short bursts, but tire quickly and fail to pass for longer durations of high velocities. The close proximity of approximately 500 feet between the two structures could result in a cumulative effect of eliminating fish migration through this section of stream. *See* Final SEIS, § 6.1.1.1.

143. Aligning the Eastern Tieback Embankment with the existing Wolverton Creek crossing at 180th Ave. South could reduce the cumulative impacts to fish and aquatic organisms on Wolverton Creek by consolidating impacts from the Eastern Tieback Embankment and the roadway into one unified crossing. *See* Final SEIS, § 6.1.1.1.

144. Conversations with the Diversion Authority about this modification have indicated that they are open to the relocation of the Eastern Tieback Embankment to the 180th Ave. alignment and are prepared to work with the road authority to accomplish this potential relocation. *See* Final SEIS, § 6.1.1.1.

145. A December 3, 2018 email from the USCAE's Terry Williams explains that, "It is recognized that some environmental impacts could be mitigated by relocating the embankment-creek crossing to be coincident with the roadway. [It is] USACE's position . . . to continue to show the current alignment of the Eastern Tieback since there is higher confidence in the ability to acquire the necessary real estate interests. The real estate interests must be in compliance with 32 CFR 644.4 which requires permanent structures be constructed on lands acquired in fee title. This requirement and assuring the integrity of dam features can be more challenging to meet when using roads and rights of way controlled by counties, townships, etc. Further optimization of the alignment will occur during the detailed design phase and USACE is committed to investigate shifting the alignment of the Eastern Tieback to 180th Avenue South (County Road 50). From an engineering design perspective this shift in alignment is likely viable, but would require compliance with USACE regulation ER-1110-2-1156 (Dam Safety) and all appropriate referenced design guidance contained therein."

146. The Permit Applicants submitted revised preliminary plans on November 15, 2018 for the Eastern Tieback Embankment crossing of Wolverton Creek. The revised plans respond to some of the concerns of commenters by aligning the 3 culverts of the Structure with the natural creek alignment, as well as depressing the invert elevation of the center 10' by 10' box culvert to accommodate low flows in the creek.

147. The Permit Applicants are required to obtain local permits such as the BRRWD permit for the Wolverton Creek Structure in Wolverton Creek.

148. The Permit Applicants propose to address the Wolverton Creek concerns raised by the commenters through an Adaptive Management and Mitigation Plan (AMMP). *See* Draft SEA #2 Appendix B.

149. Permit condition 43 requires the Permit Applicants to coordinate the final design of the Wolverton Creek Structure with the BRRWD to address the concerns expressed in ¶¶ 135 through 143.

e. Concerns about safety.

150. Commenters noted concerns that water could breach or dam failure could happen anywhere along the Revised Project's linear southern dike alignment, jeopardizing the Cities of Comstock and Rustad, as well as farmsteads, roads and railroad tracks.

151. The Permit Applicants propose to address the concerns raised by the commenters through a dam breach analysis. The Plan B Dam Breach Assessment (2018 Breach Analysis) modeled hypothetical dam failures at several locations along the Dam and during two different flood events. The results of the hypothetical dam breaches are shown in several figures in the 2018 Breach Analysis. *See* Final SEIS at § 3.9.3 and Final SEIS Appendix H.

152. The Permit Applicants will address the safety concerns raised by the commenters by undertaking a risk analysis and making appropriate adjustments during design and construction. The risk analysis provides that the Dam "will be well constructed and maintained," and will meet federal tolerable risk guidelines. *See* 2018 Risk Analysis, at § 1 (June 8, 2018).

153. An analysis of the dam safety and failure risk was included in the FFREIS as Appendix D. This analysis was performed prior to 2011. The analysis used the 2011 existing development in the Project Area in its analysis. It should be noted, however, that the 2011 analysis assumed a different dam configuration than was ultimately advanced in the Federal EIS. Appendix D of the FFREIS indicates that the expected loss of life would range from 0-594 lives in the event of a dam failure. The actual loss of life would vary based on the flood event, evacuation rate, and warning time among other factors.

154. The USACE performed an abbreviated update of the loss of life assessment in August 2016 that was provided to the DNR on September 8, 2016. *See*, Figure 2, USACE Risk Analysis White Paper (Sept. 8, 2016) (2016 Risk Analysis). The 2016 Risk Analysis was resubmitted to the DNR in 2018, with a note that the major conclusions of the risk analysis are still applicable to the Revised Project. The 2016 Risk Analysis hypothesized that a dam breach during a probable maximum flood would flood much of the F-M metropolitan area, stretching from County Road 17 in North Dakota to east of U.S. Highway 75 in Minnesota. Depths of flooding would generally be less than six feet, with levels over 15 feet in low lying areas. *Id*. Water velocity on land inundated downstream of the Dam would generally be less than two feet per second. *Id*. at Figure 3.

155. The 2016 Risk Analysis found that downstream populations would be expected to experience a "minor" increase in loss of life estimate over current conditions. This would be true even if the downstream population increased. This is primarily attributable to the fact that the anticipated flooding depth for most structures downstream of the Dam would be less than 13

feet. At 0-13 feet of inundation, the 2016 Risk Analysis concludes the area downstream of the Dam would experience a "low" fatality rate. The 2016 Risk Analysis relied on the FFREIS, which assumed the floodplain downstream of the Dam would develop regardless of whether the proposed Project is constructed.

156. The 2016 Risk Analysis concluded that the 2011 analysis is still valid for the 2016 Project. The USACE has concluded that the 2016 Risk Analysis is still valid for the Revised Project. The fatality rate of the population at risk from the dam break was based on the LIFESim model[3] that is part of the Hydrologic Engineering Center – Flood Impact Analysis (HEC-FIA) model used to simulate the potential for loss of life. The LIFESim model uses data from past disasters. The model used a fatality rate of 0% of the population at risk for 0 feet to 2 feet of inundation, 0.02% for 2 feet to 13 feet of inundation, 12% for 13 feet to 15 feet of inundation, and 91% for greater than 15 feet of inundation. In its analysis, the USACE assumed that the majority of the population at risk would have more than 60 minutes of warning time. The USACE analysis presumes that the flat topography of the Red River Basin is such that, in the event of a breach, the spread of water would cover such an expansive territory at such a low depth that the loss of life potential is low.

157. The USACE did however perform an updated Breach Analysis for the Revised Project to determine the potential extent and depth of flooding downstream should the Revised Project dam breach. *See* Plan B Dam Breach Assessment (July 17, 2018) (2018 Breach Analysis). The Breach Analysis models how the Dam could fail and the extent of inundation caused by the failure. The Risk Analysis assesses the human consequences of the failure. The 2018 Breach Analysis hypothesized a dam breach at various locations during two flood scenarios.

158. If the Dam were to breach during the Probable Maximum Flood for which the project was designed, flooding in the region would already be so extensive that the impact of the breach would not significantly contribute to flooding in the region. Therefore, the USACE analyzed a breach of the Dam during a flood event approximately three times greater than the highest recorded flood at the Fargo gage but less than the Probable Maximum Flood. A breach of the Dam during this flood event would not create worse flooding than would have occurred without the Revised Project. A second scenario analyzed a breach of the Dam during the 100-year (1% chance) flood event. A breach during this flood event would likely overtop the in-town levees, whereas a flood of this nature without the Revised Project might not overtop the in-town levees. *See* Final SEIS at 3.9.3.

159. Generally, a breach of the Dam would create extensive flooding, though water velocities would be low given the topography of the Red River valley. One measure of the

[3] LIFESim is a model developed for the USACE to estimate potential loss of life from natural floods and/or dam and levee failure during flooding events. LIFESim can be used to make dam safety risk assessments. The model is based on research conducted by the Utah State University using detailed characterizations of 60 flood case histories (with and without life loss) and includes the development of scale independent empirical fatality rate probability distributions for three flood (lethality) zones.

potential risk to human life from a breach of a dam is multiplying the depth of water (in feet) at a downstream location by the velocity of water (in feet per second) at that location. A general rule of thumb is a hazard to human life is present when the depth of flow multiplied by velocity of the flow is greater than seven. After performing this analysis for the Revised Project, DNR concluded that most areas with hazardous flows are within one-quarter mile of the Dam or along the banks of the Wild Rice River and Red River.

160. Residents in the F-M metropolitan area may have anywhere from a few hours to a few days of warning time to respond to a breach, depending on the location of the breach and the location of the resident. A breach of the Dam would take anywhere from 10 to 100 hours to overtop the in-town levees. Residents between the Dam and the in-town levees would have the shortest warning time. *See* Final SEIS at 3.9.3.

161. In the unlikely event of a breach of the Dam adjacent to Comstock, there could be minor impacts to the City of Comstock. Parts of Comstock could experience up to two feet of water if the Dam breached adjacent to the city during a flood event greater than the 500-year flood. There would be approximately six feet of water behind the Southern Embankment adjacent to Comstock during this large flood event. *See* 2018 Breach Analysis Figure 15. During the 100-year flood event, less than two feet of water would be stored behind the Southern Embankment adjacent to the City of Comstock. *See* Final SEIS Figure 9. *See* Final SEIS Table 3-8 at 3-62.

162. The City of Rustad could be impacted by depths of water up to two feet if the Dam breached at the Red River Control Structure during an event greater than the 500-year flood. A breach of the Dam during the 100-year event or at a different location would not cause impacts to the City of Rustad. *See* 2018 Breach Analysis. *See* Final SEIS Table 3-8 at 3-62.

163. Farmsteads, roads, and railroads in Minnesota could be impacted by a breach of the Dam, with the majority of the impacts occurring west of US Highway 75. Depths of flooding would generally be less than six feet with low velocities, except adjacent to the Red River. *See* 2018 Breach Analysis Figure 22.

164. Additional dam breach analyses will be required in order to develop an Emergency Action Plan. All Class I dam owners are required to complete a contingency plan (Emergency Action Plan). Minn. R. 6115.0490. This plan will be used to assist with evacuation planning. These efforts are intended to reduce the consequences of a potential dam failure. *See* Risk Analysis Section 5. These requirements are incorporated into Permit condition 28.

165. The primary way to reduce risk is to reduce the likelihood of a dam failure. Minnesota Rules for dam safety are intended to provide for public health, safety, and welfare. Minnesota Rules require current, prudent engineering practice, along with risk reduction measures such as annual dam inspections, frequent maintenance, and performance monitoring. *See* Minn. R. 6115.0300, 6115.0360, 6115.0380, and 6115.0410.

166. There are a number of Permit conditions expressly designed to address safety. These requirements include: the requirement to submit a contingency action plan prior to the last phase of construction; operating, monitoring, maintenance and inspection requirements; construction requirements; and requirements limiting development within the dam breach shadow. *See* Permit conditions 28, 30, 31, 38, 41 and 45.

f. Alternatives.

167. Commenters asserted that all upstream communities want the F-M metropolitan area to receive enhanced flood protection for its existing developed area. Their stated concerns center around the protection Plan B would provide to currently undeveloped floodplain at the expense of upstream communities. They argued that the NED, originally advanced by the USACE accomplished would have provided sufficient flood risk reduction for developed areas. They further noted that the cost of the NED was one billion dollars lower than alternatives having greater potential environmental impacts.

168. Commenters expressed concern regarding whether the Revised Project is consistent with the sequencing principles reflected in Minnesota's floodplain policy—i.e., it is the policy of the State to reduce flood damage first through floodplain management and nonstructural measures such as floodplain zoning, flood proofing, and flood warnings before the construction of flood risk reduction projects.

169. Commenters contended that there are superior alternatives to the Revised Project, and that the Revised Project is not the least impact solution. Commenters recommended the DNR consider the NED and JPA Alternatives (Alternatives 30 and 31 in the Final SEIS). They argue that a plan to remove 40-50 square miles of existing floodplain storage as proposed under the Revised Project is not sound floodplain management but is "a giant step backwards." Commenters also contended that the NED suitably modified and Alternatives 30 and 31 are prudent and feasible. In short, they contended the Permit Applicants have failed to establish that there is a "lack of other suitable feasible site[s]" as required by Minn. R. 6115.0410, subp. 8A.

170. The Permit Applicants address the topic of alternatives in their permit application. The applicants describe two alternatives that would avoid or minimize impacts to public waters. First, they describe the Base No Action Alternative that includes the flood risk reduction impacts of already completed and currently funded projects, such as temporary levee construction and property buyouts. No additional protection structures (ring levees, embankments, diversion channel) would be constructed. Flooding would continue within the project area, causing 160,000 acres of inundation and social disruptions to the Cities of Fargo and Moorhead, and adjacent communities. Second, they describe the No Action with Emergency Measures Alternative, which includes the flood risk reduction impacts of already completed and currently funded projects, and assumes that emergency measures similar to those that have been historically implemented in the project area would continue to be implemented as necessary in response to flooding. *See* 2018 Application.

171. The Permit Applicants dismissed Alternative 30 because it:

A. increases the number of structures left unprotected, including the City of Harwood, ND and other rural subdivisions.
B. increases the number of structures impacted by the footprint of the alignment.
C. increases the likelihood of environmental, stream stability, cultural resource, and maintenance impacts associated with the at-grade crossing of the Sheyenne River.
D. increases costs for land and construction.

See 2018 Draft SEA #2 at 8.

172. The DNR recognizes that while non-structural flood risk reduction measures are often the more cost effective alternative to structural measures (like levees, floodwalls and diversions), they often are not the most practical alternative. Non-structural measures such as sound land use zoning, elevation of existing improvements, structure relocation, and acquisition and removal of at-risk structures from high hazard areas are priorities for funding consideration by Minnesota's Flood Hazard Mitigation Grant Assistance Program and FEMA's Hazard Mitigation Grant Assistance Program. In particular, acquisition and removal of at-risk structures is a permanent mitigation tool that has little to no long-term operation and maintenance expense associated with it. Local units of government seeking cost share funding assistance for flood risk reduction projects determine the needs of the community and whether they wish to proceed with a structural or non-structural flood risk reduction solution. The DNR also recognizes that nonstructural flood risk reduction measures alone at any given location may not provide sufficient flood risk reduction. Often a comprehensive approach that includes elements of both structural and non-structural flood risk reduction measures are developed.

173. Minnesota Statutes § 116D.04 requires the RGU to analyze all "appropriate alternatives" and feasible and prudent alternatives less environmentally intrusive than those alternatives that are likely to impair natural resources located within the state. Minn. Stat. § 116D.04, subds. 2a and 6. Additionally, Minn. R. 4410.2300, G, requires the RGU to consider at least one alternative from each of the following categories: alternative sites; alternative technologies; modified design or layouts; modified scale or magnitude; and alternatives incorporating reasonable mitigation measures identified through comments received during EIS development. *Id*. *See* ¶¶ 47 through 54

174. As required by Minn. Stat. § 116D.04 and Minn. R. 4410.2300, G, the DNR conducted a robust and independent assessment of potential project alternatives within the above categories. In the Final SEIS, a total of 33 different alternatives were considered for full inclusion in the SEIS. *See* ¶¶ 47 through 54. The Report reconsidered all 29 previously-screened alternatives from the State FEIS, as well as four new alternatives brought forward during SEIS scoping. The 29 previously-screened alternatives were reconsidered using the updated period of record hydrology to determine if they met the legal requirements to be included or excluded from full evaluation in the SEIS. In some cases, alternatives presented a readily apparent reason for

being excluded. Other alternatives did not present a readily apparent reason for exclusion and, therefore, remained included and additional information was collected to analyze the alternative. This additional data on individual alternatives was analyzed. If, during the course of this analysis, it was determined that the alternative did not meet the requirements for further evaluation as set forth is Minn. R. 4410.2300, G, a determination was made that the alternative would not advance for further evaluation. A more complete discussion of the DNR's analysis of alternatives is found in *Id*. *See* ¶¶ 47 through 54.

175. During alternative screening, the DNR advanced Alternatives 30 and 31 for additional analysis to determine whether it should be excluded as not meeting the requirements set forth in Minn. R. 4410.2300, G. As a result of this analysis, it was determined that Alternatives 30 and 31 combined should be excluded and dismissed from the full analysis for the following reasons:

a. They did not present significant environmental benefit compared to the proposed project.

b. They had greater adverse socioeconomic impacts compared to the proposed project. *See Id*.

See Final SEIS App. B. *See* Id. See ¶¶ 47 through 54.

176. The DNR also considered the NED in the Alternatives Screening Report and determined it could not offer benefits to the state that are commensurate with the impacts to the state, and therefore would be unable to be permitted in Minnesota. This is because the NED would not represent the least impactful solution in Minnesota, and thus it would be infeasible under Minn. Stat. § 116D.04, subd.6. *See* Final SEIS §2.2.1.3.1.

g. The Revised Project promotes development of undeveloped floodplain.

177. Commenters contended the Revised Project has been designed to promote development of the floodplain to the northwest and south of Fargo. As a result, commenters argued, the Revised Project significantly reduces storage capacity immediately upstream of Fargo, and attempts to restore the lost capacity with a costly and damaging upstream storage plan.

178. Commenters expressed concern that the Revised Project does not preserve or rely on natural floodplain storage, and is inconsistent with the underlying intent of Federal Executive Orders (E.O.) 11988 and 13690.

179. The E.O. 11988 objectives are "to avoid to the extent possible the long and short term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative." To accomplish this, each federal agency is required "to take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to

restore and preserve the natural and beneficial values served by the floodplains."(FEMA http://www.fema.gov/executive-order-11988-floodplain-management)

180. E.O. 11988 is directed to federal agencies, and only federal agencies can officially determine how they comply with the executive order. The 2016 Project went through the USACE E.O 11988 review process and it was determined that the project was in compliance. *See* 2018 Draft SEA #2 5.2.2

181. Federal Executive Order 13690 was revoked on August 15, 2017. Therefore, it is not applicable to the Revised Project. (White House https://www.whitehouse.gov/presidential-actions/presidential-executive-order-establishing-discipline-accountability-environmental-review-permitting-process-infrastructure/)

182. Relative to the 2016 Project, the Revised Project would protect fewer acres of currently functioning floodplain. Specifically, the 2016 Project would have protected approximately 39,000 acres of undeveloped or sparsely developed property in the existing floodplain. *See* 2016 FOF ¶¶ 36 and 154. The Revised Project retain approximately 6,000 of these acres in the floodplain. Specifically, these 6,000 acres would be in the storage area, south of the embankment. *See* 2018 Draft SEA #2.

h. Failure to consult with LGUs.

183. Commenters contended that no effort has been made by the Diversion Authority to work with the impacted LGUs to identify impacts, mitigate impacts, and engineer solutions. Commenters expressed further concern that the Permit Applicants developed Plan B unilaterally and have not initiated work with local and regional authorities on required permits.

184. Commenters contended the Revised Project continues to envision a transfer of water upstream into Richland and Wilkin Counties. They expressed concerns that the 2018 Application has "major unresolved features" and that impacts to Richland and Wilkin Counties are being contemplated without the involvement of the relevant LGUs, particularly Richland and Wilkin Counties and the BRRWD. They contended that major revisions are needed for the final design.

185. Commenters asserted that the Permit Applicants have failed to conduct meaningful consultations with the BRRWD regarding the impacts on water management infrastructure and that the Permit Applicants have ignored the BRRWD consultative and public process required for permitting. Commenters asserted that Minnesota law places significant responsibilities on BRRWD as a regional water management authority.

186. The 2010 Buffalo Red River Watershed District Management Plan (2010 BRRWD Management Plan) establishes goals and identifies water management projects to meet

the District's mission. "The mission of the BRRWD is to alleviate flooding and to manage the water resources of the District in a manner that best protects this valuable resource." The 2010 BRRWD Management Plan divides the watershed into planning districts. The Revised Project affects the Western and Moorhead Regions of the BRRWD. The 2010 BRRWD Management Plan identifies ditch improvements for several Clay and Wilkin County ditches and Wolverton Creek improvements to address flooding and water quality issues.

187. The Southern Embankment alignment of the Revised Project does not change the operation of Clay or Wilkin County ditches from existing conditions. *See* http://www.brrwd.org/about-brrwd/ (last visited December 7, 2018)

188. The Wolverton Creek Structure design is not final. The final design could affect the performance of the BRRWD Wolverton Creek stream restoration project.

189. The Permit for the Revised Project is conditioned on the requirement that the Permit Applicants coordinate with the Buffalo Red River Watershed District on the final design of the Wolverton Creek Structure to ensure compatibility with the Wolverton Creek Restoration Project. The benefits of this requirement are maintaining the environmental enhancements of the BRRWD Wolverton Creek Restoration Project. *See* Permit condition 43.

i. Socio-economic impacts.

190. A North Dakota LGU noted concerns that during operation of the Revised Project, backed up (i.e., stored) water would extend into its jurisdiction, compromising the ability of the Red River and its tributaries to effectively and efficiently move water downstream. According to the commenter, the stored water would cause damage to the County's ditches, roads and other water management infrastructure, which, in turn, would increase maintenance costs for the county and threaten the rural, agricultural economy.

191. A North Dakota LGU noted concerns that the Project impacts three cemeteries.

192. A North Dakota citizen identified many concerns with the Revised Project, including: the Revised Project invites transfer of flood risk to land that has not historically flooded; depresses land value and results in loss of their home; impacts to agriculture, such as late planting, ponding, and a potential inability to receive Federal Crop Insurance; impacts to a local church's congregation size; and impacts to multi-generational farms.

193. The Diversion Authority proposes to address concerns raised by the North Dakota LGU regarding impacts to public lands (e.g., township and county roads, drainage ditches, cemeteries, and parks) through a Post-Operation Repair and Debris Clean-Up Plan and one-time flowage easement payments for affected properties. The intent of the flowage easement payment is to "precompensate" property owners for expenses associated with flooding resulting from operation of the Revised Project. In addition to the flowage easement, the Permit Applicants propose to compensate public land owners for repair and clean-up. This Post-Operation Repair and Debris Clean-Up Plan will allow LGUs to contract for repair and debris clean-up and submit

expenses for reimbursement. The Diversion Authority will review and reimburse accepted expenses. *See* Final SEIS Appendix F.

194. The Diversion Authority proposes to address concerns raised by the North Dakota LGU and the North Dakota citizen regarding the economic impacts to the agricultural community by way of flowage easements, the Post-Operation Repair and Debris Clean-up Program, and a Summer Operation Supplemental Crop Loss Program. Both the flowage easements and the Post-Operation Repair and Debris Clean-Up Program are described above in ¶ 193. Under a Summer Operation Supplemental Crop Loss Program, the Diversion Authority would provide producers 90-percent coverage for crop losses associated with Project-induced flooding of growing crops during summer operation (e.g., a major rain event). *See* Final SEIS Appendix F and Permit conditions 22 and 23.

195. Cemetery mitigation is proposed by the Diversion Authority and currently covers the five cemeteries within the Property Rights Area. The Property Rights Area is the area in which the Permit Applicants propose to acquire property interests that they believe are needed to construct and operate the Revised Project. The Property Rights Area was identified by using the Probable Maximum Flood (i.e., the maximum elevation of the spillway, which is expected to be no higher than 923.5 feet (NAVD88)). Currently, the boundary of the Property Rights Area is extended beyond the 923.5-foot contour to the existing parcel boundaries. The Property Rights Area will be finalized based on the final design of the Project, and the final boundary could be defined by describing by survey the actual contour on the parcel. All land within this boundary will receive a flowage easement, the value of which will be based on appraisal.

196. Each of these five cemeteries would receive a flowage easement and would be eligible to participate in the Post-Operation Repair and Debris Clean-up Program for public lands as described above in ¶ 193. The Diversion Authority will work with the National Register of Historic Places to ensure that mitigation for National Register-eligible cemeteries complies with Section 106 of the National Historic Preservation Act (Section 106) and 36 CFR 900 prior to Revised Project operation. The Diversion Authority is also committed to meeting with each of the five cemeteries to discuss additional non-structural measures. Mitigation to cemeteries is required by the Permit. *See* Permit condition 25 (requiring mutually agreed upon mitigation for cemeteries).

197. As permitted by Section 106, mitigation of Historic Properties would be addressed through the Programmatic Agreement entered into by the Diversion Authority, USACE and State Historical Preservation Office. Mitigation for impacts to cemeteries is required by the Permit. *See* Permit condition 25 (requiring mutually agreed upon mitigation for cemeteries).

198. The Diversion Authority does not propose mitigation for socioeconomic impacts that result in a reduction of church congregation size or multi-generational farm operations.

199. Insufficient mitigation was one of several factors that led DNR to deny a permit for the 2016 Project. The Permit Applicants have made several revisions to the mitigation

measures of the Revised Project. Notable revisions include a debris clean-up and repair program and an extension of the property acquisitions and flowage easements area. Despite this additional information being available, many commenters had questions and/or concerns on how mitigation would occur and whether mitigation would adequately address all impacts.

200. The Post-Operation Debris Clean-Up Plan for private lands places the responsibility for debris clean-up on the property owner. Property owners will be responsible for moving debris to established field entrances or access points that the debris clean-up contractors can access without impacting farm operations. After each occurrence, property owners could voluntarily sign a "right of entry" to allow the contractors to enter and access other portions of their private property. *See* Final SEIS, Appendix F.

201. A flowage easement confers on the holder of the easement the right to flood the property as set forth in the easement agreement. The fee owner is legally entitled to use the property encumbered by the flowage easement in any manner that does not interfere with the flowage easement (i.e., the right to store flood waters). The holder of the flowage easement may not encumber the use and enjoyment of the underlying fee owner when the property is not flooded. Therefore, it is the Permit Applicants' responsibility to clear all flood-induced debris and address flood-induced damages to the underlying property that would interfere with the fee owners' use and enjoyment, notwithstanding the Permit Applicants' proposed flowage easement language. This includes any resulting soil erosion, sedimentation, invasive species, or contamination of soil (undesirable minerals and nutrients) arising from the operation of the Revised Project. Since the Post-Operation Repair and Debris Clean-Up Program for private lands is not sufficient to address these property encumbrances, the Permit is conditioned on addressing these use damages to the underlying fee. *See* Permit condition 23.

202. The DNR notes that the Summer Operation Supplemental Farm Crop Loss Program (Crop Loss Program) lacks many details needed to determine sufficiency for impacts to agricultural producers. Although there is a conceptual plan for the Crop Loss Program, details will not be developed until 2019 or 2020. *See* Final SEIS, Appendix F. In general, the Crop Loss Program proposes to compensate producers in the upstream storage area for crop losses directly caused by operation of the Revised Project during the "normal crop growing season"; it fails to outline the dates of "normal crop growing season". The Permit Applicants found that insurance premiums for summer flood events may be cost prohibitive, and as such, anticipate creating a self-funded insurance reserve fund for the Crop Loss Program within the Operation and Maintenance Funding Program (O&M Funding Program). The total estimated maximum loss for all crops in the storage area is approximately $20-25 million. *Id*. Other missing details include who would be empowered to settle claims, the criteria for granting claims, the claims process, and timeline. Finally, the Crop Loss Program appears to be a concept and not a fully-committed Program. The Permit requires demonstration of an adequate reserve fund prior to completion of the Revised Project *See* Permit condition 46 (requiring the Permit Applicants have submitted a financial analysis that demonstrate that they have created the necessary reserve fund to compensate for crop no less than 3 years prior to completion of the Revised Project).

203. The Diversion Authority prepared a Property Rights Acquisition and Mitigation Plan (PRAM), which addressed environmental and socioeconomic mitigation not covered by the USACE's Adaptive Management and Monitoring Plan (AMMP, which covers environmental mitigation and monitoring). *See* Final SEIS, App. F. The PRAM intends to ensure that all of the mitigation costs outlined would be eligible for funding through the O&M Funding Program. *See* Final SEIS § 3.10.3. The O&M Funding Program will provide funding for monitoring and potential future environmental and socioeconomic mitigation, including, but not limited to, debris/physical damage clean-up and repair, and operation and maintenance costs. The O&M Funding Program will also provide a mechanism for funding unforeseen mitigation needs that may arise as a result of operation of the Revised Project. *Id*. The O&M Funding Program has yet to be sufficiently detailed (e.g., not all costs for the above-mentioned mitigations have been estimated) to permit any reliance on the sufficiency of the O&M Funding Program to address the required mitigation. The Permit requires full mitigation funding and implementation prior to project operation. *See* Permit condition 27 (requiring that the Permit Applicants have fully funded all mitigation measures within five years and further requiring that all mitigation be completed one year prior to completion of the Revised Project construction).

204. A specific theme emerged from comments related to the Revised Project impact to family farms that are multigenerational. In these cases, the commenters observed that the Permit Applicants' mitigation does not address the impact on these families. *See* Final SEIS at Issues and Areas of Controversy. No mitigation has been proposed or identified to address this concern. The Permit Applicants are required to pay just compensation for any property required for the construction, operation and maintenance of the Revised Project.

j. Inadequacy of land acquisition plan.

205. A number of commenters observed that the Revised Project will take or damage private properties during the course of construction or by storing flood water on them when the Revised Project is operational. Many of these properties had not experienced previous flooding or will experience an increase in flooding. *See* ¶ 72 (describing the storage area). These commenters claimed that the Permit Applicants have yet to meet with the affected landowners or to obtain the required easements from the affected landowners. They posited that these communications and rights must be obtained prior to permit issuance.

206. The JPA further opined that the Revised Project violates Section 5 of the *Rules of the Buffalo-Red Watershed District* (May 21, 1979), which provides in part: "Surface water shall not be artificially removed from the upper land to and across lower land without adequate provision being made on the lower land for its passage, nor shall the natural flow of surface water be obstructed so as to cause an overflow onto the property of others."

207. Issues associated with property acquisition necessary for the Revised Project are addressed in the PRAM. *See* Final SEIS Appendix F. The PRAM is prepared to comply with the requirement of the Minn. Stat. Ch. 117, the federal Uniform Relocation Assistance (URA) and Real Property Acquisition Policies Act of 1970 and associated regulations. *See*, 49 CFR 24.104.

208. The PRAM includes an Organic Farmland Acquisition Plan that offers early acquisition of organic farmlands in the storage area so that farmers have the opportunity to establish organic certification on new lands outside the storage area.

209. The FEMA/USACE Coordination Plan (FEMA Plan) describes the property interests that the USACE believes need to be acquired for the 100-year flood inundation to residential and non-residential insurable structures with more than two feet of flood inundation within the FEMA revision reach. Structures with up to two feet of flood inundation within the FEMA revision reach would be evaluated for non-structural mitigation measures, such as the construction of ring levees or the relocation or elevating of structures. The FEMA Plan indicates that acquisition may be considered in areas where risk and safety analysis indicates that leaving structures in place would be inappropriate. The FEMA Plan does not identify property interests that need to be acquired in the event that the Revised Project is operated at maximum dam capacity. The FEMA Plan indicates if the structure is located outside the FEMA revision reach, the Diversion Authority will undertake a takings analysis to determine whether they will acquire the necessary property interests.

210. The PRAM also includes a Flowage Easement Plan for the upstream storage area. The Flowage Easement Plan provides that flowage easements will be acquired from select properties. The Flowage Easement Plan also indicates that landowners whose properties are modeled to receive less than six inches of flood water impact when the Revised Project is operational at the design flood "may elect" to receive a payment for "actual and physical flood damages". *See* PRAM at 33-35. The Flowage Easement Plan provides a one-time payment to a landowner for the right to inundate the property as part of the Revised Project's operation and/or maintenance. The flowage easement is intended to compensate the property owner for the right to flood the property, which includes a taking of certain use rights including the right to use the land for development, planting, and damages associated with the deposit of flood debris on the land. The terms of any flowage easement will require the removal of all structures in the floodway and nonconforming structures in the floodplain. Flowage easements are scheduled to be acquired prior to operation of the Revised Project, with the latest anticipated acquisition date set at 2025.

211. Minnesota Rule 6115.0240, subp. 2A provides that a government agency or corporation may apply for a public waters work permit "if the property rights acquired or to be acquired are fully described in the application."

212. Minnesota Rule 6115.0470 provides that in the case of a dam safety permit, "[w]here the activities authorized by a permit involve the rights or interests of any other persons, or any public interests, the permittee, before proceeding, shall acquire all necessary interests or permissions, including paying the costs of the alteration, relocation or replacement of any publicly owned facility."

213. Neither Minn. R. 6115.0240, subp. 2A nor Minn. R. 6115.0470 requires a permit applicant that is a "governmental agency" or "corporation authorized by law" to acquire the

property interests necessary to construct or operate the project prior to the issuance of either public waters work permit or a dam safety permit.

214. As set forth in ¶ 210, the Permit Applicants have submitted a description of the property interests which they propose to acquire for purposes of both construction and operation of the Revised Project as required by Minn. R. 6115.0240, subp. 2A.

215. The Fifth Amendment of the U.S. Constitution prohibits the federal government from taking property for a public purpose without first paying the landowner just compensation for the taking of his or her property. The Fourteenth Amendment of the U.S. Constitution makes the Fifth Amendment takings requirement applicable to the individual states.

216. Article I § 13 of the Minnesota Constitution expressly provides: "Private property shall not be taken, destroyed or damaged for public use without just compensation therefor, first paid or secured."

217. The Minnesota Supreme Court has recognized that the periodic flooding of a person's land resulting from the operation of a flood risk reduction project or as a result of the construction of a dam up to the maximum water level of the dam impoundment constitutes a taking within the meaning of the Minnesota Constitution. *See State v. Bentley,* 45 N.W.2d 185 (Minn. 1950) and *Nelson v. Wils*on, 58 N.W.2d 330 (Minn. 1953), *see also United States v Causby*, 328 U.S. 256 (1946)(holding physical invasion of property constitutes a taking).

218. In considering the 2016 Project, DNR reviewed the Permit Applicants' acquisition plan, including the plan to acquire flowage easements. At that time, the DNR, by letter dated, July 27, 2016, notified the Diversion Authority that Minnesota law requires that property interests be secured up to the water surface elevation at the maximum capacity of the Dam.

219. The DNR has concluded that the Permit Applicants must acquire an interest in all property that will be flooded by the Revised Project when operated at maximum capacity that would not be flooded under current conditions, as well as in all those properties that will sustain an increase in the depth of flooding as a result of the operation of the Revised Project at maximum capacity. These rights must be fully acquired prior to operation of the Revised Project and the Permit is conditioned on this requirement. *See* Permit conditions 22 and 23.

220. Acquiring the legal right to flood the properties in the storage area by acquiring a legal interest in said properties satisfies the requirements of Section 5 of the *Rules of the Buffalo-Red River Watershed District* (May 21, 1979) because the acquisition of those said flowage easements constitutes an "adequate provision" authorizing said flows.

k. Concerns with fish passage, biological connectivity, stream geomorphology, and wildlife.

221. DNR received extensive comments from the DNR FAW expressing concerns that the Revised Project would be a barrier to fish passage on the Red River. In particular, they stated

that the Revised Project conflicts with state and provincial management plans, including the following plans governing fish management in the Red River Basin:

a. Red River of the North Fisheries Management Plan. 2017. Minnesota Department of Natural Resources, North Dakota Game and Fish Dept., Manitoba Stewardship and South Dakota Dept. of Game, Fish and Parks
b. Restoration of Extirpated Lake Sturgeon in the Red River of the North Watershed. 2002. Minnesota Dept. of Natural Resources, Division of Fisheries.
c. Fish Habitat Plan: A Strategic Guidance Document. 2013. Minnesota Dept. of Natural Resources, Section of Fisheries.
d. National Fish Habitat Action Plan. 2nd Edition. 2012. Association of Fish and Wildlife Agencies.

The FAW expressed particular concern about the impact of the Revised Project on lake sturgeon.

222. Likewise, DNR EWR expressed concern that the Red River and Wild Rice Control Structures would cut off meanders, remove flood flows and lessen access to floodplain habitat. In addition to echoing the comments made by the FAW regarding the impact of stream connectivity on aquatic species, the EWR recommended that any applicable DNR permits be conditioned to assure that the Revised Project meets the navigational requirements set forth in Minn. R. 6115.0231, that any culverts used in the Revised Project meet the culvert standards developed by the MNDOT, that the Permit Applicants use in-stream construction methods if possible, that the Permit Applicants prepare a velocity model report for the Red River Control Structure for flows at a 2-, 10-, and 20-year flood event, and that the Permit Applicants provide better figures and drawings to determine invert elevation for low flows.

223. Additionally, DNR EWR and DNR FAW expressed concerns that the Revised Project's diversion channel may limit use of the channel by wildlife, create hazards, block migratory species, and promote invasive species.

224. DNR EWR questioned the viability of using the diversion channel for mitigation. Specifically, they expressed concern that the flashy flows in the diversion channel will limit use by wildlife and that high flows will destroy habitat in the diversion channels and other reaches of the Revised Project. These high flows will likely scour and remove existing vegetation, replacing it with cattails and reed canary grass, which are of limited value wildlife. DNR EWR also acknowledged that the channel could be developed to promote good quality habitat, e.g. braided features and riparian/oxbow like features.

225. The Permit Applicants propose to address the concerns raised by DNR FAW on the AMMP. *See* Final SEIS Appendix G. The Permit Applicants claim that there is some uncertainty about the degree of impact the Revised Project would have on fish passage and biological connectivity. The main project feature that has been adjusted to address fish passage and biological connectivity is the frequency of operation. Limiting operation of the Revised Project to flood events above the 20-year flood allows more natural hydrology for more frequent

floods, but does not address the impact for flood events greater than a 20-year event. Preliminary concepts for design of the Revised Project water control structures includes rock riffles or other features to increase roughness and decrease water flow velocities through the structures. Also, the three gates planned for both the Red River Control Structure and the Wild Rice River Control Structure are separated by abutments that can collect debris and increase velocities through the structures (until it can be removed), thus creating conditions that could reduce fish passage.

226. The AMMP document proposes to provide mitigation for impacts to aquatic habitat, forests and direct wetland impacts. Concerns about impacts to river geomorphology, indirect wetland impacts, biological connectivity and fish stranding are proposed to be addressed by monitoring Project impacts to determine if mitigation is warranted. If and when the Permit Applicants determine that future mitigation is warranted, the AMMP has identified a number of mitigation projects that might be implemented. These future projects include:

a. Restoration of the Bois de Sioux River
b. Restoration of the Lower Otter Tail River
c. Restoration of the Sheyenne River
d. Drayton Dam Fish Passage
e. Red River Fish Passage Retrofit
f. Sheyenne River Fish Passage
g. Other Fish Passage Projects (unspecified)

These mitigation projects, if implemented, could improve river habitat by connecting oxbows and recreating more natural riverine conditions in areas where the rivers have been channelized or otherwise degraded. The fish passage projects would construct rock rapids or make other modifications to existing dams and water control structures to improve fish and other aquatic organism passage through these features.

227. The AMMP identifies approximately 124 acres of floodplain forest lands that will be impacted by the Revised Project construction and operation. These floodplain forests will be mitigated by the creation of 253 acres of floodplain forest. The increase in acres needed for mitigation is intended to account for the lengthy time required to grow trees in newly-created floodplain forest. *See* Final SEIS § 3.4. Additionally, the feasibility of monitoring to capture Project-related indirect wetland impacts is questionable. The AMMP needs more detail on triggers for action based on monitoring results and identification of adaptations that could be implemented.

228. There will be short and long-term hydrological, stream morphological and biological impacts from the Revised Project. Since 1990, the DNR has worked with numerous partners to remove or modify seven of the eight low-head dams on the Red River. These efforts have been driven by public safety, river restoration, and fish passage objectives, and also the desire to reduce infrastructure costs. The erection of a new main stem, high hazard dam is contrary to decades-long management efforts for this riverine system. To place a significant structure in the river, cut off a major river meander, fill in part of the lost meander with the levee, and construct a 12-mile long berm across the landscape will require significant mitigation that

improves connectivity, fish passage, and habitat values and restores meanders and stream stability. The promise of potential future mitigation is not sufficient to address these concerns. *See* email from Henry Drewes to Jamison Wendel and others (November 6, 2018).

229. The Permit Applicants claim that the engineered channel that connects the Red River Control Structure will mitigate aquatic habitat impacts. The habitat within engineered channels will have limited natural function because of the altered substrates, reduced vegetation, modification of slope, altered velocity and increased erosion.

230. DNR has significant concerns about a mitigation plan predicated on future promises especially where, as here, the Revised Project will cut off a significant meander of the Red River at the Red River Control Structure by approximately 4000 feet. DNR is concerned about the use of the Index of Biological Integrity (IBI) as the sole source of habitat quality assessment in mitigation calculations. IBI is used as an indicator of watershed habitat, not specific locations within a river reach. DNR would need to see a more robust assessment of habitat impacted to ensure mitigation is suitable, and the adoption of an alternative method to guide stream habitat mitigation that does not rely on site specific IBI scores.

231. To minimize and compensate for these impacts, DNR EWR and FAW state that the Revised Project should avoid or minimize use of control structures to help maintain original channel alignments and to prevent barriers to fish passage, complete the Drayton Dam project, run water through the diversion channels on a periodic basis to sustain habitat, collect additional information on the impacts of the Wolverton Creek Structure on stream geomorphology, prepare a velocity model report for the Red River Control Structure, use bare root tree seedlings to supplement seed planting in forest mitigation areas and fund the Lower Otter Tail River Restoration.

232. Specific mitigation conditions intended to address the concerns set forth in ¶¶ 221 through 231 are described in Permit conditions 27, 43, 44, 47, and 50 (mitigation requirements).

VI. PERMIT REVIEW STANDARDS

233. The Commissioner of DNR is required to make findings of fact on issues necessary for determination of applications considered. Orders made by the commissioner must be based upon findings of fact made on substantial evidence. Minnesota Statutes § 103G.315, subd. 2. In making these Findings of Fact, the DNR has evaluated the relevant environmental review documents and associated supporting documentation, the Permit Application and associated documentation, public comments, and all applicable documentation compiled and prepared by the DNR and its agents relevant to the statutory and regulatory analysis necessary to make a ruling on the Permit Application discussed herein. In these Findings and Conclusions, the Commissioner makes all findings necessary for making final rulings on the Permit Application.

234. The DNR has the authority to impose conditions on permits. Minn. Stat. § 103G.315, subd. 1. *See also* subd. 6, subd. 8. The Permit imposes conditions on the Permit Applicants' proposed construction, operation, and maintenance of the Dam, consistent with Minnesota Dam Safety and Public Waters Work Permit requirements.

235. Applications for dam safety and public waters work permits must be in writing on a form prescribed by the Commissioner. *See* Minn. Stat. § 103G.245, subd. 3; Minn. R. 6115.0240. The Applicants submitted the Permit Application in writing in the form required under the Dam Safety and Public Waters Work Permit regulations.

236. The permit "applicant has the burden of proving that the proposed project is reasonable, practical and will adequately protect public safety and promote the public welfare." Minn. Stat. § 103G.315, subp. 6.

237. If the DNR concludes that the plans of an applicant are reasonable, practical, and will adequately protect public safety and promote the public welfare, then the DNR must grant the permit. Minn. Stat. § 103G.315, subd. 3.

238. Minnesota Statute § 103G.315, subd. 13 provides that the Commissioner shall set the time period within which construction authorized in permits must be completed. Minn. Stat. § 103G.315, subd. 13. As required by statute, the DNR cannot exceed a 5-year permit term. Construction of the Project is anticipated to take 10 years. Minnesota Statute § 103G.315, subd. 13 allows for the permit time period to be extended after application and for good cause.

VII. ANALYSIS OF STATUTORY AND REGULATORY REQUIREMENTS: WORK IN PUBLIC WATERS

239. Minnesota Statute § 103A.205 provides:

> It is the policy of the state to promote the retention and conservation of all water precipitated from the atmosphere in the areas where it falls, as far as practicable. Except as otherwise expressly provided all . . . departments . . . of the state or political subdivisions having any authority or means for constructing, maintaining or operating dams or other works or engaging in other projects or operations affecting precipitated water shall use the authority, as far as practicable, to effectuate the policy in this section.

240. Minnesota Statute section § 103G.245, subd. 1 (1) prohibits any person, private or public corporation or any governmental unit of the state from construction, reconstruction, transferring ownership of or making any change in reservoir, dam or waterway obstruction on public waters over which the State of Minnesota has jurisdiction without first obtaining a public waters work permit. Minnesota Statute section § 103G.245, subd. 1(2) prohibits a person from changing or diminishing the course, current or cross section of a public water without first obtaining a public waters work permit.

241. A public waters work permit, including a dam safety permit, may not be issued if the proposed project fails to conform to state, regional, and local water and related land use management plans. Minn. Stat. § 103G.245, subd. 6.

242. The Red River Control Structure requires placement of fill in the primary channel of the Red River.

243. The Red River is a public water within the meaning of Minn. Stat. § 103G.005, subd. 15(a).

244. The construction of the Eastern Tieback Embankment requires the placement of fill and the construction of three culverts in Wolverton Creek (Wolverton Creek Structure) in Clay County, Minnesota.

245. Wolverton Creek is a public water within the meaning of Minn. Stat. § 103G.005, subd. 15(a).

246. The Project, therefore, requires a public waters work permit within the meaning of Minn. Stat. § 103G.245, subd. 1.

247. On March 16, 2018 the Diversion Authority submitted an Application for a public waters work permit. The Permit Application was amended on June 4, 2018 to include the Wolverton Creek Structure.

A. The Permit Application is Complete and Contains all Required Information

248. A public waters work permit application submitted by a governmental agency or corporation authorized by law to conduct the project must include the following information to be deemed complete:

a. Documentation attached to the application fully describing the property rights acquired or to be acquired for the project. Minn. R. 6115.0240, subp. 2.

b. "[A]ppropriate photographs, maps, sketches, drawings or other plans that adequately describe the proposed project" for which the permit is being sought. Minn. R. 6115.0240, subp. 3B.

c. A brief statement of: (1) the anticipated changes in water and related land resources; (2) any unavoidable anticipated detrimental effects on the natural environment; (3) alternatives to the proposed action for which the permit is sought; and (4) a showing that the proposed action for which the permit is sought is reasonable, practical, and will adequately protect public safety and promote the public welfare. Minn. R. 6115.0240, subp. 3C (1)-(4).

d. A demonstration that the proposed activity for which the permit is sought complies with the following principles in descending order of priority: (1)

avoids direct and indirect impacts to public waters that may destroy or diminish the public waters; (2) minimizes impact to the public water by limiting the magnitude of the public water activity; (3) mitigates or rectifies the impact on the affected public water; (4) reduces or eliminates the impact to the public water over time by preservation and maintenance operations; and (5) for any major changes to the public waters, replaces unavoidable impacts through restoration of equal or greater value or, if restoration opportunities are not reasonably available, by creating and protecting replacement water of greater public value. Minn. R. 6115. 0240, subp. 3C(5).

e. The payment of any application fees. Minn. R. 6115.0240, subp. 3D.

f. Proof of service of the application and accompanying documents on the mayor of the city and the secretary of the soil and water conservation district in which the project for which the permit is requested is located. Minn. R. 6115.0240, subp. 3E

249. Attachment 7 to the 2018 Application is a Draft Property Rights Acquisition and Mitigation Plan (2018 Application Attachment 7). This document includes a description of the property interests the Permit Applicants will acquire as necessary for actual physical construction of the Dam, including the Southern Embankment, Red River Control Structure, the Eastern Tieback Embankment, as well as the Wolverton Creek Structure. *See* 2018 Application, Attachment 7 Property Rights Acquisition and Mitigation Plan. The 2018 Application also includes a description of the some of the property interests that will be acquired in the Storage Area but does not include all of the property that needs to be acquired in the Storage Area. Property in the Storage Area will be impacted by the operation of the Revised Project at maximum capacity.

250. The Final SEIS Appendix F describes and identifies property interests that need to be acquired in the event that the Revised Project is operated at maximum capacity. DNR has included a permit condition requiring that the Permit Applicants obtain all of the property interests that would experience new or increased flooding due to the Revised Project. The combination of the PRAM with the permit conditions referenced herein meets the requirements of Minn. R. 6115.0240, subp. 2c. Permit conditions 22 and 23 require the Permit Applicants to acquire all necessary property interests including flowage easements for all properties that are required for both construction and operation of the Dam. This includes all properties in the storage area that would experience new or increased flooding as a result of operation of the Revised Project.

251. Attachment 12 of the Permit Application includes a Plan View and Profile View for both the Red River Control Structure and the Wolverton Creek Structure. The Plan Views overlay an aerial photograph of the site over the Red River Control Structure and the Wolverton Creek Structure designs.

252. The Permit Applicants have also submitted Attachment 12, which is a map that depicts the Red River Control Structure and the Wolverton Creek Control Structure locations.

253. The Permit Applicants have also submitted a Preliminary Plan Design Report, which includes descriptions of the structures and an engineering analysis for the Red River Control Structure. Additional information submitted by the Diversion Authority includes: soil borings, soil exploration maps, seismic information, piezometer location data, fill volumes for the Wolverton Creek Structure, and a Phase 9 Hydrology and Hydraulics Report that includes description of the Wolverton Creek Structure and the Red River Control Structure.

254. As set forth in ¶¶ 251 through 253, the 2018 Application together with the Permit Map, the Preliminary Plan Design Report, and the Phase 9 Hydrology and Hydraulics Report meet the requirements of Minn. R. 6115.0240, subp. 3B.

255. The Phase 9 Hydrology and Hydraulics Report describes the anticipated changes to the Red River and its tributaries that will be caused by the Revised Project, and the Final SEIS together with the State FEIS fully describe water- and land-related resources that will change upon construction and operation of the Revised Project. Together these documents satisfy the requirements of Minn. R. 6115.0240, subp. 3C(1) that the application contain a description of the anticipated changes in land and water resources.

256. Attachment 7 to the 2018 Application also contains a brief description of the environmental impacts that will be caused by the Revised Project. The AMMP outlines the proposed mitigation measures. These document meets the requirements of Minn. R. 6115.0240, subp. 3C(2), requiring the permit applicant to provide a brief description of "the unavoidable anticipated detrimental effects on the natural environment" associated with a proposed project.

257. The 2018 Application includes as alternatives to the Revised Project the Base No Action Alternative and the No Action Alternative with Emergency Measures. The 2018 Application defines the Base No Action Alternative as the already completed and currently funded flood risk reduction projects that have been or will be undertaken within the Cities of Fargo and Moorhead regardless of whether the Revised Project is constructed. The No Action Alternative with Emergency Measures is the Base No Action Alternative but also includes those emergency measures that have been historically implemented by the Cities of Fargo and Moorhead for flood protection. A more detailed description of these alternatives is set forth in ¶ 170.

258. In addition to two alternatives summarized in the 2018 Application, the DNR also reviewed a number of alternatives in the environmental review process. A description of these alternatives is set forth in ¶¶ 47 through 54.

259. As set forth in ¶¶ 257 and 258, the 2018 Application contains a brief description of alternatives to the Revised Project as required by Minn. R. 6115.0240, subp. 3C(3).

260. As set forth in ¶ 104, the 2018 Application contains a brief description of the public need for the Revised Project. Additionally, 2018 Application Attachment 10 is a copy of the *Fargo-Moorhead Area Flood Diversion Task Force: Final Report* (January 18, 2018) (Task

Force Report) and contains statements from Governor Dayton and Governor Burgum in which both Governors acknowledge the importance of providing flood risk reduction for the F-M metropolitan area in convening the Governors' Task Force. As noted by Governor Dayton: "Reliable and effective flood protection for the cities of Moorhead and Fargo and their surrounding regions is essential. It is a prerequisite for successful future economic growth, business expansion, job creation and social vitality." Governor Dayton goes on to acknowledge that this necessary flood protection must acknowledge the impact of a project of such magnitude on the livelihood of others. *Id*. at 9-10. Members of the Governors' Task Force generally recognized the need for enhanced flood risk reduction for developed portions of the F-M metropolitan area, though they did offer a variety of perspectives regarding how best to achieve this objective. Consistent with the Task Force Report attached to the 2018 Application, the Revised Project is designed to provide flood risk reduction for the F-M metropolitan area. This need statement is consistent with the public welfare and advances public safety. Therefore, the 2018 Application meets the requirements of Minn. R. 6115.0240, subp. 3C(4).

261. A major flood risk reduction project by its nature will have significant impacts to the environment and, therefore, the Permit Applicants are not able to demonstrate that the Revised Project will either avoid or "…minimize the impact to the public water by limiting the degree or magnitude of the public water activity and its implementation." Minn. R. 6115.0240, subp. 3C(5)(a)-(b).

262. As set forth in the 2016 FOF, the DNR declined to permit the Permit Applicants' 2016 Project in part because it failed to adequately mitigate the significant impacts to public waters. The Permit Applicants through their 2018 Application have redesigned the project in an attempt to rectify this shortcoming. The AMMP contains a mitigation plan that demonstrates how the Permit Applicants propose to rectify, mitigate, reduce, or eliminate the impact of the Revised Project on the Red River and Wolverton Creek. A more detailed analysis of these mitigation measures is found in ¶¶ 221 through 232.

263. The 2018 Application together with AMMP meets the requirement that the permit application contains information demonstrating how the Revised Project and mitigation meet the requirements of Minn. R. 6115.0240, subp. 3C(5)(c)-(e).

264. The Diversion Authority made the final payment of the $1000 application fee on April 17, 2018. The Diversion Authority has paid all permit fees required by Minn. R. 6115.0240, subp. 3D and subp. 4.

265. The 2018 Application was sent through the MPARS system to the local governmental units on June 5, 2018. Minn. R. 6115.0240, subp. 3E.

266. As set forth in ¶¶ 248 through 265, the Permit Application meets requirements set forth in Minn. R. 6115.0240 and is deemed complete.

B. The Permit Application Satisfies the Requirements of Minn. R. 6115.0190 and 6115.0191

267. Minnesota Rule 6115.0190 and Minn. R. 6115.0191 regulate the placement of fill in public waters.

268. It is the goal of the DNR to limit the placement of fill in public waters to minimize encroachment, change, or damage to the environment and to regulate the quantity and quality of fill and the purposes for which fill is allowed based upon the capabilities of the waters to assimilate the material. Minn. R. 6115.0190, subp. 1.

269. Minnesota Rule 6115.0190, subp. 3 prohibits the placement of fill for vegetation control, the creation of upland, the stabilization of public waters or springs, and the creation of island access. Neither the Permit Applicants' proposal for the Red River Control Structure nor the Wolverton Creek Structure involve the prohibited placement of fill within the meaning of Minn. R. 6115.0190, subp. 3.

270. Minnesota Rule 6115.0190, subp. 5A requires that a permitted project may "…not exceed more than a minimum encroachment, change or damage to the environment, particularly the ecology of the waters."

271. Both the Red River Control Structure and the Wolverton Creek Structure are essential elements of the Revised Project and are needed to meet the project purpose of "reducing flood risk potential associated with a long history of frequent flooding on local streams including the Red River, Sheyenne, Wild Rice (North Dakota), Maple, Rush and Lower Rush rivers passing through or into the F-M metropolitan area. . . . [and] reduce flood risk for floods exceeding the 100-year flood or greater, given the importance of the F-M metropolitan area to the region and recent frequencies of potentially catastrophic flood events." *See* 2018 Permit Application at 4. *See also* Final SEIS § 1.4.

272. The total fill areas required for the Red River Control Structure and the Wolverton Creek Structure are 3.0 and 1.3 acres, respectively. To mitigate this fill, the Permit Applicants are required to partially fund the Lower Otter Tail River Restoration Project. *See* Permit condition 27.

273. As illustrated by the Alternatives Analysis set forth in ¶¶ 47 through 54 and ¶¶ 167 through 176, the selected alternative (the Revised Project) was the sole alternative that met the project need of reducing historic flood risk potential and flood risk exceeding the 100-year flood.

274. As more fully discussed in ¶¶ 55 through 66, ¶¶ 134 through 182, and ¶¶ 232, the DNR has identified a number of environmental impacts associated with the Revised Project, has analyzed the Permit Applicants' proposed mitigation and has conditioned the Permit to assure that the impacts associated with the Revised Project are mitigated. As it pertains to mitigation to address change and damage to the environment and ecology of the waters, the Permit contains the following mitigation requirements.

a. Cold weather impacts.

a. Permit conditions 44 and 47 require the Permit Applicants to monitor aqueduct impacts to the riverine system, provide heating components in the aqueduct to reduce the potential for freezing or ice buildup, and install gages to ensure flow is continuous in the aqueduct.

b. Invasive species impacts.

a. Permit conditions 12 and 48 require the Permit Applicants to ensure that all construction equipment will be free of invasive species, to develop an invasive species management plan prior to the start of construction as outlined in the AMMP, and to control noxious weeds on the Revised Project in perpetuity.

c. Cover type impacts.

a. Permit conditions 10 and 49 require the Permit Applicants to mitigate the loss of floodplain forests and to wooded/forested cover types by replacement at a 2:1 ratio and to monitor the mitigation sites according to a revised and DNR-approved AMMP.

d. State-Listed Species and Species of Special Concern.

a. Permit condition 27 requires the construction of fish passage at Drayton Dam to address impacts to the lake sturgeon.

e. Hydrology and hydraulics.

a. Permit conditions 44 and 50 require the Permit Applicants to identify potential areas of geomorphological impacts, erosion and sedimentation; undertake required monitoring; and set forth a commitment to control geomorphological impacts, erosion and sedimentation predicted to result from the Revised Project operation.

b. Permit condition 43 requires the Permit Applicants to coordinate the final design of the Wolverton Creek Structure with the BRRWD and the DNR to minimize impact to stream restoration work. This includes the potential redesign of the Wolverton Creek Structure to align with the 180th Ave. South Wolverton Creek Crossing.

f. Wetlands.

a. Permit condition 10 requires the Permit Applicant to address wetland impacts as required by the Clean Water Act and Minnesota Wetland Conservation Act (WCA).

g. Aquatic and terrestrial resources.

a. Permit condition 27 requires the Permit Applicants to modify the Drayton Dam by removing the existing dam and constructing a rock arch rapids. These modifications would address impacts to aquatic and stream connectivity, fish passage, high velocity flow at the control structures, and aquatic and terrestrial resources.

b. Permit condition 27 requires that the Permit Applicants contribute funding to the restoration of the natural channel and the reconnection of meanders in

an 11-mile segment of the Lower Otter Tail River to mitigate for the loss of public waters and associated functions due to the Revised Project.

Finally, to assure that mitigation is funded and constructed, Permit condition 27 requires that the Drayton Dam Project and Lower Otter Tail Restoration Project are funded and the construction or implementation has commenced within five years from the date of permit issuance. Work under the Permit will not be permitted to continue unless this condition is met within five years from the date of permit issuance. All mitigation must be in place prior to the commencement of operation. Mitigation for indirect impacts and other unknown impacts will be described and addressed through the AMMP. *See* Permit condition 44.

275. As set forth in ¶¶ 267 through 274, the Revised Project with the required mitigation meets the requirements of Minn. R. 6115.0190, subp. 5A.

276. Minnesota Rule 6115.0190, subp. 5B requires that all fill "consist[] of clean inorganic material that is free of pollutants and nutrients." The Permit is expressly conditioned on the requirement that the Permit Applicants and their agents or assigns use only clean, inorganic, pollution free fill that meets the requirements of Minnesota Rule 6115.0190, subp. 5B for the Revised Project. *See* Permit condition 51.

277. Minnesota Rule 6115.0190, subp. 5C requires that "the supporting foundation [of the project] is established by appropriate means including soil boring data . . ."

278. As required by Minn. R. 6115.0190, subp. 5C, the Permit Applicants have submitted preliminary soil boring data and analyzed subsurface conditions in the Project Area. *See* 2018 Application Attachment 2 Soil Boring Data, Attachment 8 Diversion Inlet Control Structure Design, Attachment 9 Wild Rice River Control Structure Design. These documents indicate that the supporting foundation of the Revised Project is well understood. The Permit is conditioned on the submittal of final construction plans. This condition requires additional foundational information and imposes additional foundational requirements prior to the commencement of the Revised Project construction. *See* Permit condition 32.

279. The Permit is conditioned on use of BMPs for erosion control to ensure stability of the embankments after dam and culvert extension construction. Minn. R. 6115.0190, subp. 5D (requiring erosion protection as deemed necessary by the commissioner). *See* Permit condition 18.

280. As set forth more fully in the discussion of alternatives contained in ¶ 29, ¶¶ 47 through 54, ¶¶ 167 through 176, and ¶¶ 258 through 259, the alternatives analysis demonstrates that the Revised Project is the "minimal impact solution" to the need to reduce historic flood risk potential and flood risk exceeding the POR 100-year flood as required by Minn. R. 6115.0190, subp. 5E.

281. As further discussed in ¶ 278, the character and topography of the stream channel of the Red River and Wolverton Creek are such that any fill required by the Red River Control Structure and Wolverton Creek Structure is stable as required by Minn. R. 6115.0190, subp. 5F

282. As more fully described in ¶¶ 55 through 65, ¶¶ 134 through 182, and ¶ 231, the Revised Project has many significant environmental impacts. As described in ¶ 274, these environmental impacts are mitigated as required by Minn. R. 6115.0190, subp. 5G.

283. Minnesota Statute § 103G.245, subd. 6 provides that a public waters work permit may not be issued "if the project does not conform to state, regional, and local water and related land resources management plans."

284. Minnesota Statute § 103G.245, subd. 9 provides that a public waters work permit to control floodwaters using structural means may be granted by the commissioner only after the commissioner has considered all other flood reduction alternatives. As further discussed in ¶ 29, ¶¶ 47 through 54, ¶¶ 167 through 176, and ¶¶ 258 through 259, the commissioner has considered all other feasible and prudent flood reduction alternatives to the Revised Project.

285. Minnesota Rule 6115.0190, subp. 5H requires that any filling is consistent with applicable "floodplain, shoreland, and wild and scenic rivers management standards and ordinances for the waters involved." Minnesota Rule 6115.0190, subp. 5I requires that the "proposed filling is consistent with water and related land management plans and programs of local and regional governments, provided such plans and programs are consistent with state plans and programs."

286. The Revised Project does not impact a wild and scenic river.

287. A number of LGUs in both North Dakota and Minnesota have adopted ordinances or rules that, on their face, appear to be inconsistent with the Revised Project. For example, Section 20.2.7 of Wilkin County's zoning ordinance expressly states that it does not "allow, provide for, nor contemplate the use of Wilkin County lands for staging and storage behind a Red River Dam." Section 20.04 of Wilkin County's zoning ordinance expressly prohibits "large surface water impoundments in Wilkin County." The Revised Project is inconsistent with this zoning ordinance. *See* ¶ 298. Holy Cross Township adopted an ordinance that places a moratorium on water impoundments within Holy Cross Township; this moratorium expired in 2016 (Holy Cross Township Ordinance #0001).

288. In 2016, the DNR found the 2016 Project to be inconsistent with state floodplain management laws and local ordinances intended to reduce floodplain development. In particular, the DNR found that the 2016 Project was to protect 39,000 acres of undeveloped or sparsely developed floodplain in North Dakota for future development. The 2016 Project flooded 12,300 acres of non-floodplain in Minnesota and flooded 8,100 acres of non-floodplain in North Dakota. The 2016 Project benefitted 10,200 acres in Minnesota and 62,700 acres in North Dakota. Under the 2016 Project, North Dakota would have received 86% of the project benefits as compared to the 14% received by Minnesota. The 2016 Project would have impacted significantly more

acreage in Minnesota than it benefited. *See* 2016 FOF ¶¶ 33 through 36. Thus, under the 2016 Project, non-floodplain lands in Minnesota would have been flooded to make floodplain available in North Dakota for future development. The DNR found, therefore, that the 2016 Project violated Minnesota law. *See* 2016 FOF ¶¶ 162 through 177.

289. As set forth in ¶ 182, the Revised Project reduces the acreage of undeveloped or sparsely developed floodplain in North Dakota that would be removed from the floodplain. Also importantly, as set forth in ¶¶ 61, 81 and 82, the benefits that accrue to Minnesota under the Revised Project are roughly proportional to the Minnesota acreage in the storage area. Thus, arguably under the Revised Project, Minnesota land is being flooded to protect developed areas in Minnesota and not to protect undeveloped areas in North Dakota. Minnesota has no jurisdictional authority to prohibit North Dakota from flooding North Dakota lands to protect undeveloped North Dakota floodplain for future development.

290. Because of the geology, topography, weather, and land use in the Red River Basin, communities throughout the Red River Basin have had a long history of major flooding. Since as early as 1919 the States of Minnesota and North Dakota have recognized the importance of addressing flood damage reduction from a regional perspective. *Red River Basin Flood Damage Reduction Work Group Agreement* at 2 (December 9, 1998) (1998 Mediated Agreement).

291. The nature of flood damage reduction projects, such as the placement of levees or the construction of dams, is such that flood damage reduction projects undertaken in one community have the potential to impact flooding in other communities within the Red River Basin. Historically, there has been tension among communities along the Red River in both Minnesota and North Dakota surrounding the cross-jurisdictional impacts of flood damage reduction efforts.

292. The Red River Basin Flood Damage Reduction Work Group (RRBFDR Work Group) was formed to address issues related to flood damage reduction projects on the Red River. The RRBFDR Work Group includes leadership from the DNR, the USACE, the Board of Water and Soil Resources (BWSR), the Minnesota Pollution Control Agency (MPCA), the US Fish and Wildlife Service, the Minnesota Department of Agriculture, the Red Lake Nation, and LGUs within the Red River Basin, as well as citizen members. The formation of the RRBFDR Work Group recognized that, because flooding in the Red River Basin is regional in nature, the development of flood damage reduction projects must be addressed from a regional perspective. *See* 1998 Mediated Agreement at 2 through 4 (setting forth the history of flooding in the Red River Basin and the creation of the RRBFDR Work Group). The work of the RRBFDR Work Group has historically received funding from the Minnesota Legislature through the Red River Watershed Management Board, demonstrating a continuing commitment from the Minnesota Legislators to approaching flood damage reduction along the Red River from a regional or basin wide perspective. *Id*. at 2 through 4.

293. In 1997, the Minnesota Legislature appropriated funding to the Red River Watershed Management Board to: "develop a Red River Basin plan that will aid in coordinating

the water management activities in the states and provinces bordering the Red River." 1997 Minn. Laws Ch. 216. In 1998 the Minnesota Legislature authorized the Minnesota counties on the Red River to levy additional sales taxes, one-half of which was credited to the Red River Watershed Management Board "for funding the development, construction, and maintenance of projects and programs of the Red River Basin." 1998 Minn. Laws Ch. 389.

294. In 1998, after extensive flooding in 1997, the RRBFDR Work Group developed a mediated agreement intended to guide flood damage reduction on the Red River. The 1998 Meditated Agreement's overarching goal is to reduce flood damages across the basin by: (1) preventing loss of life; (2) preventing damage to farm structures, homes and communities; (3) reducing damage to farm land (3) reducing damage to water quality; (3) reducing damage to transportation; (4) reducing damage to the environment caused by flood control projects; (5) reducing social and economic damage; and (6) reducing damage to natural resource systems caused by flooding. *See* 1998 Mediated Agreement at 8-9. To reduce flood damage, the Mediated Agreement relies on strategies intended to alter land use practices in flood prone areas and built projects such as the construction of dams and levees. *Id*. at 9-12.

295. The 1998 Mediated Agreement further provides that decisions on flood risk reduction projects in the Red River Basin should be based on consensus agreements "on long term solutions for reducing flood damage and for protection and enhancement of natural resources. Such agreements should balance important economic, environmental, and social considerations, and must provide for fair and effective procedures to resolve future conflicts related to flood damage reduction." *Id* at 4.

296. Minnesota Courts have held that a local ordinance will be held invalid where a local ordinance conflicts with state law, e.g., if the local ordinance forbids what state law expressly authorizes. *State v. Apple Valley Redi-Mix, Inc.*, 379 N.W. 2d 136, 138 (Minn. Ct. Ap. 1999). If, however, the local ordinance merely seeks to regulate the manner of the activity permitted by state law, the ordinance is not in conflict with state law and is permitted. *Id*.

297. Minnesota Statute § 103G.245, subd. 6 requires that the public waters work permit conform to state, regional and local water and related land resources management plans.

298. To the extent that individual communities in the Red River Basin adopt local ordinances that preclude a regional approach to flood damage reduction by prohibiting elements of flood risk reduction projects within their jurisdiction, those ordinances conflict with the legislative intent that flood risk reduction in the Red River Basin should be addressed from a regional perspective. Such ordinances are in conflict with state law, state plans, and the 1998 Mediation Agreement and cannot be imposed on regional projects such as the Revised Project. To the extent that those ordinances merely regulate the manner in which the Revised Project is constructed, said regulations do not violate state law, state plans and the 1998 Mediation Agreement, and the Permit Applicants are required to comply with said regulations as set forth in Permit Condition 21.

299. DNR's review of the applicable ordinances adopted by Minnesota LGUs indicates that only those ordinances adopted to expressly preclude flood storage within their jurisdiction or precluding construction of elements of the Revised Project within their jurisdiction are in conflict with Minnesota law and are, therefore, not a valid basis on which to deny a permit to the Revised Project.

300. Contrary to assertions made by commenters, the Revised Project is not inconsistent with Section 5 of the *Rules of the Buffalo-Red Watershed District* (May 21, 1979). This rule provides, in part: "Surface water shall not be artificially removed from the upper land to and across lower land *without adequate provision being made on the lower land* for its passage, nor shall the natural flow of surface water be obstructed so as to cause an overflow onto the property of others." (Emphasis added). This provision is not violated because the Permit is expressly provisioned on the requirement that the Permit Applicants obtain either a fee or easement interest in all property that will be affected by the Revised Project when the Revised Project is operated at maximum capacity. *See* Permit condition 22.

301. The 2010 Buffalo Red River Watershed District Management Plan establishes goals and identifies projects to meet the District's mission. "The mission of the BRRWD is to alleviate flooding and to manage the water resources of the District in a manner that best protects this valuable resource." The Management Plan divides the watershed into planning districts. The proposed project affects the Western and Moorhead Regions. The Management Plan identifies ditch improvements for several Clay and Wilkin County ditches and Wolverton Creek improvements to address flooding and water quality issues.

302. The southern embankment alignment of the proposed project does not change the operation of Clay or Wilkin County ditches from existing conditions.

303. Federal Executive Order (EO) 11988 objectives are "to avoid to the extent possible the long and short term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative." To accomplish this, each federal agency is required "to take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by the floodplains."(FEMA http://www.fema.gov/executive-order-11988-floodplain-management)

304. EO 11988 is directed at federal agencies and only federal agencies can officially determine how they comply with the executive order. The USACE discussed EO 11988 in the USACE Draft SEA #2 and identified that the Revised Project removed fewer floodplain acres than the 2016 Project. There was no further discussion of compliance with EO 11988 in the Draft SEA #2. *See* Draft SEA #2 § 5.2.2.

305. Even if EO 11988 was applicable to the individual states, as explained in ¶¶ 179 and 180, Minnesota has no jurisdictional authority to compel North Dakota to comply with its requirements.

306. Federal Executive Order 13690 was revoked on August 15, 2017. Therefore, it is not applicable to the Revised Project.

307. The Revised Project does not fall within the special filling standards requirements set forth in Minn. R. 6115.0191, subps. 3 through 7.

308. As set forth in ¶¶ 385 through 445, the Revised Project is protective of public safety and promotes the public welfare.

C. The Permit Application Satisfies the Requirements of Minn. R. 6115.0200 and 6115.0201

309. Minn. R. 6115.0200 and 6115.0201 regulate any activity that results in the displacement or removal of bottom materials or the widening, deepening, straightening, realigning, or extending of public waters. It may involve proposals for excavations landward or waterward from the OHW.

310. Construction of the Revised Project requires excavation of the bed and banks of the Red River and Wolverton Creek to construct the Red River Control Structure and the Wolverton Creek Structure, respectively. The areas of excavation are: 2.5 acres of the Red River and 0.5 acre of Wolverton Creek.

311. The excavation is not undertaken to gain access to navigable waters pursuant to Minn. R. 6115.0200 subp. 3A.

312. Excavation for the Revised Project will not extend riparian rights to nonriparian lands in Minnesota, or promote the subdivision and development of nonriparian lands. Minn. R. 6115.0200 subp. 3B.

313. Minnesota Rule 6115.0200, subp. 3C prohibits the DNR from issuing a public water works permit "when the proposed excavation will be detrimental to significant fish and wildlife habitat and there are no feasible, practical, or ecologically acceptable means to mitigate the effects."

314. As outlined in ¶¶ 55 through 65, ¶¶ 134 through 182, and ¶¶ 221 through 232, the Revised Project will impact fish and wildlife habitat. The DNR, in ¶¶ 267 through 308, has identified feasible, practical and ecologically acceptable mitigation measures to mitigate the identified impacts. As set forth in ¶ 274, the Permit is expressly conditioned on these mitigation measures.

315. As set forth in ¶¶ 59, 221 and 274, the Revised Project will impact the lake sturgeon, a state-listed species of special concern, and other listed species. The Permit is expressly conditioned on mitigating for potential impacts to lake sturgeon.

316. The Revised Project does not involve the placement of fill for development purposes. Minn. R. 6115.0200, subp. 3E.

317. Recurrent sedimentation at the excavation site is not a consideration for the Revised Project, which proposes excavation only in connection with constructing the Red River Control Structure and the Wolverton Creek Structure. Minn. R. 6115.0200, subp. 3F.

318. Minnesota Rule 6115.0200, subp. 3G and Minn. R. 6115.0201, subp. 7F require that any public waters work permit include provisions for the acceptable disposal of excavated material. Permit condition 17 requires the Permit Applicants, as a part of their detailed construction plans, to include a plan for the reuse and/or disposal of spoil materials in compliance with all applicable federal, state and local requirements.

319. The Revised Project will not cause increased seepage that would lower the water level of a public water within the meaning of Minn. R. 6115.0200, subp. 3H.

320. As set forth in ¶¶ 309 through 319, the excavation for the Revised Project is not prohibited excavation within the meaning of Minn. R. 6115.0200, subp. 3.

321. As set forth in ¶¶ 106 through 109, the 2018 Application includes design reports, subsurface condition reports, and soil boring logs that delineates the area of the proposed Red River Control Structure. Also attached to the 2018 Application as Attachment 11 is a Hydrology and Hydraulics Report for both the Red River Control Structure and the Wolverton Creek Structure. DNR's review of these documents indicates that excavation is reasonable and practical based upon geologic and hydrologic conditions, as required by Minn. R. 6115.0200 subp. 5A(1)–(4).

322. Minnesota Rule 6115.0200, subp. 5B governs the disposal of excavated materials. Permit condition 17 requires that the detailed construction plans for the Revised Project include a detailed plan for the reuse, and/or disposal of spoil materials in compliance with all applicable federal, state, and local requirements.

323. As set forth in ¶¶ 47 through 54, ¶¶ 167 through 176, and ¶¶ 258 through 259, the Revised Project is the sole alternative that met the project need of reducing historic flood risk potential and flood risk exceeding the 100-year flood. As mitigated, the Revised Project is the least impactful solution within the meaning of Minn. R. 6115.0200, subp. 5C and 5F and Minn. R. 6115.0201, subp. 7O. *See* ¶ 232 and ¶ 274 and PRAM.

324. An evaluation of the 2018 Application together with attachments indicates that the proposed excavation is limited to the minimum dimensions necessary to construct the Red River Control Structure and the Wolverton Creek Structure as required by Minn. R. 6115.0200, subp. 5D.

325. The public waters in which the excavations will occur are not "perched on an impervious stratum' and, therefore, Minn. R. 6115.0200, subp. 5E is inapplicable to the Revised Project.

326. As more fully discussed in ¶ 232 and ¶ 274, the Permit is conditioned upon the completion of feasible and practical mitigation as required by Minn. R. 6115.0200 subp. 5G.

327. Minn. R. 6115.0200, subp. 5H. requires the protection of water supply, navigation, and drainage characteristics:

a. Water Supply: The Revised Project may impact wells and septic systems of some residences that are not relocated. The Permit Applicants assert that wells and septic systems serving residences that remain within the storage area will be modified to prevent impacts from flooding. As further set forth in ¶¶ 205 through 220, Permit condition 22 requires the Permit Applicants to acquire all necessary property interests from property owners whose property will be taken or damaged through construction or operation of the Revised Project at maximum design or protect said properties from such damages.

b. Navigation: Navigation on the Red River in the area of the Red River Control Structure is not expected to be impeded except when the Revised Project is operational. Navigation on Wolverton Creek is currently impeded by multiple road crossings and culverts. The Wolverton Creek Structure is not anticipated to alter the current status of navigation on Wolverton Creek.

c. Drainage characteristics: The Revised Project is an integrated flood damage reduction project that is designed to reduce overall flood damages. The drainage characteristics of the area will be heavily altered. In general, the Revised Project will result in a reduction of flood risk in the F-M metropolitan area, particularly south of Fargo, and an increase in flood risk in areas outside of Fargo-Moorhead, particularly the proposed storage area upstream of the Dam. *See* State FEIS at § 3.16.2.3.10. To assure that the public and riparian landowners are not adversely affected by the Revised Project, the Permit is conditioned on the acquisition of an interest in all property that will be flooded by the Revised Project when operated at maximum capacity that would not be flooded under current conditions, as well as in those properties that will sustain an increase in the depth of flooding as a result of the operation of the Revised Project at maximum capacity. These rights must be fully acquired prior to operation of the Revised Project and, as set forth in ¶¶ 205 through 220, the Permit is conditioned on this requirement.

328. The Revised Project affects designated shoreland and, therefore, local shoreland zoning ordinances are applicable. Minn. R. 6115.0200, subp. 5I and 5J. As set forth in ¶¶ 287 through 302, the Revised Project meets the requirements of Minn. R. 6115.0200, subp. 5I and 5J.

329. The Revised Project does not involve excavation to construct a harbor, boat slip, or other mooring facility within the meaning of Minn. R. 6115.0200, subp. 5K.

330. The Revised Project does not involve excavation for beach development, water basin excavations, navigation-related purposes, harbors and boat slips, or fish and wildlife habitat improvement within the meaning of Minn. R. 6115.0201, subp. 2 through subp. 6.

331. The Revised Project does not change the watercourse capacity for normal flows within the meaning of Minn. R. 6115.0201, subp. 7A.

332. A detailed design for the Revised Project has not been completed. Permit conditions 17 and 32 expressly require the Permit Applicants to submit final design plans, including a detailed erosion control plan, to assure compliance with Minn. R. 6115.0201, subp. 7B and 7N.

333. The Hydrology and Hydraulics Report indicates that the construction of the Revised Project's excavated areas will alter flows of the Red River and Wolverton Creek. These altered flows will not produce substantial flow increases in downstream areas. However, the detailed design, including scour analysis, has not yet been completed for the Revised Project; so the full extent of potential new downstream erosion hazards is unknown. Therefore, Permit conditions 17 and 32 expressly require the Permit Applicants to submit final design plans, including a detailed erosion control plan, to assure compliance with Minn. R. 6115.0201, subp. 7C.

334. The requirements of 6115.0201, subp. 7D. are superseded by Minn. Stat. § 103F.48 and are inapplicable.

335. The design for the Revised Project shows that the alignment and slope of the excavated channels of Red River in the vicinity of the Red River Control Structure and of Wolverton Creek in the vicinity of the Wolverton Creek Structure will have a smooth channel transition as required by Minn. R. 6115.0201, subp. 7E. *See* Preliminary Design Report.

336. The Revised Project is an integrated flood damage reduction project that is designed to reduce overall flood damages. The drainage characteristics of the area will be heavily altered. In general, the Revised Project will result in a reduction of flood damage in the F-M metropolitan area, particularly south of Fargo, and an increase in flood damage in areas outside of the F-M metropolitan area, particularly in the storage area upstream of the Revised Project's Southern Embankment. *See* State FEIS § 3.16.2.3.10. Therefore, in compliance with the requirements of Minn. R. 6115.0201, subd. 7G and as further set forth in ¶¶ 205 through 220, Permit condition 22 requires the Permit Applicants to acquire all necessary property interests from property owners whose property will be taken or damaged through construction or operation of the Revised Project at maximum design.

337. As set forth in ¶ 29 and ¶¶ 130 through 133, in developing the Revised Project the Permit Applicants relied on the work of the Governors' Task Force Process. The Revised Project as well as all previous Project proposals were also the outgrowth of extensive federal and state environmental review. There has been considerable public outreach and engagement about the

Revised Project and its historic iterations. The Permit Applicants have gathered the names and addresses of landowners who are believed to have a substantial interest in the project. However, as a formal condition of the Permit and as required by Minn. R. 6115.0201, subp. 7H, the Permit Applicants are required to submit a list of persons with substantial interests in the Revised Project to the DNR. *See* Permit condition 52.

338. The Revised Project is an integrated system of features to reduce overall flood damages. The proposed excavation is required to construct the Red River Control Structure and the Wolverton Creek Structure. The Revised Project does not propose to widen, deepen, or straighten the Red River and Wolverton Creek to increase their channel capacity to better convey high flows. Therefore, the requirements of Minn. R. 6115.0201, subp. 7I. are inapplicable.

339. Excavation has been limited to the minimum extent necessary to construct the Red River Control Structure and the Wolverton Creek Structure as required by Minn. R. 6115.0201, subp. 7J.

340. The excavation is not for construction of a sediment trap, settling basin, or fish and wildlife habitat restoration; nor is the excavation in an officially designated trout stream and therefore, the requirements of Minn. R. 6115.0201, subd. 7K through 7M are inapplicable.

341. The Revised Project realigns a section of the Red River, cutting off one channel meander bend approximately 4,200 feet in length. The Revised Project will reduce downstream flood impacts. The Hydrology and Hydraulics report included with the 2018 Application is sufficient to analyze the flooding impacts of the Revised Project. As outlined in ¶ 332 the Permit is conditioned on a final design and plans, identification of potential areas of downstream erosion, and measures to control the erosion. With this condition the requirements of Minn. R. 6115.0201, subp. 7N are met.

342. The requirements of Minn. R. 6115.0201 subp. 7O are inapplicable to the Revised Project.

D. The Permit Application Satisfies the Requirements of Minn. R. 6115.0210 and 6115.0211

343. Minnesota Rules 6115.0210 and 6115.0211 apply to the placement, construction, reconstruction, repair, relocation, abandonment, or removal of any structure placed on or in public waters.

344. Navigation on the Red River in the area of the Red River Control Structure is not expected to be impeded except when the Revised Project is operational. Navigation on Wolverton Creek is currently impeded by multiple road crossings and culverts. The Wolverton Creek Structure is not anticipated to alter the current status of navigation on Wolverton Creek. Therefore, the Revised Project is not expected to impede navigation and Minn. R. 6115.0210, subp. 3A is not applicable.

345. As articulated in ¶ 314, the Revised Project has significant impacts on fish and wildlife habitat. However, as further set forth in ¶ 314, the Revised Project is conditioned on the completion of feasible and practical measures to mitigate the effects in compliance with Minn. R. 6115.0210, subp. 3B.

346. The Red River Control Structure and the Wolverton Creek Structure are not designed or intended to be used for human habitation or as a boat storage structure within the meaning of Minn. R. 6115.0210, subp. 3C.

347. The Red River Control Structure and the Wolverton Creek Structure are not designed or intended to include walls, a roof, or sewage facilities within the meaning of Minn. R. 6115.0210, subp. 3D.

348. As set forth in ¶ 315, the Revised Project will impact the lake sturgeon, a state-listed species of special concern, and other listed species. The Permit is expressly conditioned on mitigating for potential impacts to lake sturgeon. *See* Permit Condition 27. Impacts are not anticipated to threatened or endangered species from the Revised Project, therefore the requirements of Minn. R. 6115.0210, subp. 3E do not apply. *See* State FEIS § 3.10.2.1.

349. As set forth in ¶¶ 343 through 348, the proposed Red River Control Structure and Wolverton Creek Structure are not prohibited by Minn. R. 6115.0210, subp. 3.

350. As set forth in ¶ 29, ¶¶ 47 through 54, ¶¶ 167 through 176, and ¶¶ 258 through 259, the Revised Project is the sole alternative that met the project need of reducing historic flood risk potential and flood risk exceeding the 100-year flood. As mitigated, the Revised Project is the least impactful solution within the meaning of Minn. R. 6115.0210, subp. 5A and 5B. *See* ¶ 232 and ¶ 274.

351. The Revised Project affects designated shoreland and other land management requirements, and water management plans and, therefore, local shoreland zoning ordinances and land management requirements are applicable. Minn. R. 6115.0210, subp. 5C. As set forth in ¶¶ 287 through 302, the Revised Project meets the requirements of Minn. R. 6115.0210, subp. 5C and 5E.

352. As more fully discussed in ¶ 314, the Permit is conditioned upon the completion of feasible and practical mitigation as required by Minn. R. 6115.0210, subp. 5D.

353. The Diversion Authority, a public agency, is accepting responsibility for future maintenance of the Revised Project, so the requirements of Minn. R. 6115.0210, subp. 5F do not apply.

354. The Revised Project does not propose to construct or reconstruct a wharf, breakwaters, mooring facility, retaining walls and erosion and sedimentation control structures, boat launching ramps, boathouses, or energy exchangers and, therefore, the requirements of Minn. R. 6115.0211, subps. 3 through 6b are inapplicable.

355. The Red River Control Structure and the Wolverton Creek Structure are not 'other facilities' within the meaning of Minn. R. 6115.0211, subp. 7 and, therefore, subpart 7 is inapplicable.

E. The Permit Application Satisfies the Requirements of Minn. R. 6115.0220 and 6115.0221

356. Minnesota Rules 6115.0220 and 6115.0221 regulate the construction, repair, and abandonment of any structure intended to impound, divert, or control the level or flow of public waters.

357. The proposed Red River Control Structure is intended to control the level of the Red River to manage flood risk in the Fargo-Moorhead area. The Project proposer is the Diversion Authority, consisting of several local units of government and created through a Joint Powers Agreement in 2011. The Diversion Authority has partnered with the U.S. Army Corps of Engineers to plan, fund, and construct the Project. The Project is not intended to manipulate water levels solely to satisfy private interests. Therefore, the proposed Red River Control Structure is not a prohibited water level control facility within the meaning of Minn. R. 6115.0220, subp. 3.

358. The watershed of the Red River is greater than 300 acres and, as outlined in ¶ 390, the Red River Control Structure qualifies as a dam under Minnesota Law so the Revised Project is not exempt from the requirements of Minn. R. 6115.0220, subp. 4.

359. As articulated in ¶ 314, the Revised Project has significant impacts on fish and wildlife habitat. However, as further set forth in ¶ 274, the Revised Project is conditioned on the completion of feasible and practical measures to mitigate the effects in compliance with Minn. R. 6115.0220, subp. 3A.

360. As set forth in ¶ 274, the Revised Project with the required mitigation meets the requirements of Minn. R. 6115.0220, subp. 5B.

361. The Revised Project affects designated shoreland and other land management requirements, and water management plans and, therefore, local shoreland zoning ordinances and land management requirements are applicable. Minn. R. 6115.0200, subp. 5C. As set forth in ¶¶ 287 through 302, the Revised Project meets the requirements of Minn. R. 6115.0220, subp. 5C and 5D.

362. As set forth in Part VIII of this Finding of Fact, the Revised Project complies with parts Minn. R. 6115.0300 to 6115.0520 to the extent applicable and, therefore, satisfies the requirements of Minn. R. 6115.0220, subp. 5E.

363. The Revised Project will control and store flood waters. Minn. R. 6115.0220, subp. 5F(1) and 6115.0220, subp. 5G(1).

364. The Revised Project will not manage water levels for a lake, for fish and wildlife management purposed, or for a landlocked waterbasin and, therefore, the requirements of Minn, R. 6115.0221, subp. 2 – subp. 4 are inapplicable.

365. The need for the Revised Project is set forth in the 2018 Application and as more fully explained in ¶ 29, ¶ 67, ¶¶ 80 through 81, ¶ 104, ¶¶ 167 through 176, ¶ 182, ¶¶ 258 through 259, and ¶¶ 288 through 289, the need is established in terms of quantifiable benefits as required by Minn. R. 6115.0221, subp. 5A.

366. DNR's review of the 2018 Application and the Preliminary Design Report demonstrates that the structural design for the Revised Project was completed by a professional engineer as required by Minn. R. 6115.0221, subp. 5B(1) – (13).

367. The Revised Project will be owned, operated, and maintained by the Diversion Authority whose membership is composed of the City of Fargo, ND, the City of Moorhead, MN, Clay County, MN, Cass County, ND and the Cass County Joint Water Resources District. *See* ¶ 23. In compliance with Minn. R. 6115.0221, subp. 5C and to assure that the Revised Project is properly operated and maintained, requirements will be set forth in an operation and maintenance plan that must be approved by the DNR prior to completion of construction of the Revised Project. *See* Permit condition 31.

F. The Permit Application Satisfies the Requirements of Minn. R. 6115.0230 and 6115.0231

368. Minnesota Rules 6115.0230 and 6115.0231 govern the placement and replacement of culverts in public waters.

369. The Revised Project includes the Wolverton Creek Structure, which will be constructed where the Eastern Tieback Embankment crosses Wolverton Creek. The structure consists of three 10-by-10 foot reinforced concrete box culverts. The Eastern Tieback Embankment elevations were selected to allow flow to overtop during the PMF event. However, flows passing over the embankment and through the culverts during the PMF event will not be greater than the flows passing through this location under existing conditions. Therefore, the structure does not significantly increase flood damages or create a water safety hazard. Navigation on Wolverton Creek is currently impeded by multiple road crossings and culverts. The Wolverton Creek Structure is not anticipated to alter the current status of navigation on Wolverton Creek. *See* 2018 Application and Attachment 11 Hydrology and Hydraulics Report. As such, the Wolverton Creek Structure is not a prohibited crossing within the meaning of Minn. R. 6115.0230, subp. 3A-B.

370. The Revised Project is an integrated flood damage reduction project that is designed to reduce overall flood damages. The drainage characteristics of the area will be heavily altered. In general, the Revised Project will result in a reduction of flood damage in the F-M metropolitan area, particularly south of Fargo, and an increase in flood damage in areas outside of the F-M metropolitan area, particularly in the storage area upstream of the Revised

Project's Southern Embankment. *See* FEIS § 3.16.2.3.10. The Revised Project requires rechannelization within the meaning of Minn. R. 6115.0230, subp. 3C and therefore must comply with the requirements of Minn. R. 6115.0201, subp. 7. *See* ¶¶ 331 through 342 (discussing the application of Minn. R. 6115.0201, subp. 7 to the Revised Project).

371. As articulated in ¶ 314, the Revised Project has significant impacts on fish and wildlife habitat. However, as further set forth in ¶ 274, the Revised Project is conditioned on the completion of feasible and practical measures to mitigate these effects and is, therefore, not prohibited by Minn. R. 6115.0230, subp. 3D.

372. As set forth in ¶ 315, the Revised Project will impact the lake sturgeon, a state-listed species of special concern and other listed species. The Permit is expressly conditioned on mitigating for potential impacts to lake sturgeon. *See* Permit Condition 27. Impacts are not anticipated to threatened or endangered species from the Revised Project, therefore the requirements of Minn. R. 6115.0230, subp. 3E do not apply. *See* State FEIS § 3.10.2.1. *See* ¶ 274.

373. The Wolverton Creek Structure does not provide private access to an island and is, therefore, not a prohibited project pursuant to Minn. R. 6115.0230, subp. 3F.

374. As set forth in ¶¶ 368 through 373, the proposed culvert extension does not involve a prohibited crossing within the meaning of Minn. R. 6115.0230, subp. 3A through 3F.

375. As set forth in ¶¶ 47 through 54, ¶¶ 167 through 176, and ¶¶ 258 through 259, the Revised Project is the sole alternative that met the project need of reducing historic flood risk potential and flood risk exceeding the 100-year flood. As mitigated, the Revised Project is the least impactful solution within the meaning of Minn. R. 6115.0230, subp. 5A. *See* ¶¶ 233 and 274.

376. As articulated in ¶ 314, the Revised Project has significant impacts on fish and wildlife habitat. However, as further set forth in ¶ 274 the Revised Project is conditioned on the completion of feasible and practical measures to mitigate the effects in compliance with Minn. R. 6115.0230, subp. 5B.

377. The Revised Project affects designated shoreland and other land management requirements, and water management plans and, therefore, local shoreland zoning ordinances and land management requirements are applicable. Minn. R. 6115.0230, subp. 5C and 5D. As set forth in ¶¶ 287 through 302, the Revised Project meets the requirements of Minn. R. 6115.0230, subp. 5C and 5D.

378. This project does not involve the crossing of public water basins or public water wetlands and therefore Minn. R. 6115.0230, subp. 5E is inapplicable.

379. As required by Minnesota Rule 6115.0231, subp. 2A, the 2018 Application and Attachment 11, the Hydrology and Hydraulics Report, contain the required hydraulic analysis.

380. The proposed Wolverton Creek Structure is a new culvert and, therefore, the requirements of Minn. R. 6115.0231, subp. 2B are applicable:

a. The floodway for Wolverton Creek is not a community designated floodway, so the prohibition of placing approach fill into the floodway is not applicable. The Hydrology and Hydraulics Report identifies a small increase of 0.11 feet in water surface elevation for the 100-year event just upstream of the Wolverton Creek Structure and Eastern Tieback Embankment. *See* Final SEIS § 3.2.2.1.3. This increase is observed until approximately three miles upstream. The increase in flood stage is not reflected in the floodplain boundaries and flood protection elevation adopted in the local floodplain management ordinance. Therefore, to meet the requirements of Minn. R. 6115.0231, subp. 2B(1), the Permit requires that any structures affected by an increase in stage be acquired or relocated. *See* Permit Condition 22.
b. The Wolverton Creek Structure is not a replacement structure so Minn. R. 6115.0231, subp. 2B(2) does not apply.
c. The structure is not on a major transportation route so Minn. R. 6115.0231, subp. 2B(3) does not apply to the Wolverton Creek Structure.

381. The Wolverton Creek Structure may impede game fish movement. *See* ¶¶ 221 through 232. At the 10-year flood event, water velocity through the Wolverton Creek Structure has an estimated water velocity of 3.4 feet/second. Based on this information, the structure could impede the passage of fish and aquatic organism passage through the Wolverton Creek Structure when the Revised Project is not operating. *See* Final SEIS § 3.5.2. Therefore, to meet the requirements of Minn. R. 6115.0231 subp. 2C, and as more fully discussed in ¶ 274, the Permit is conditioned upon the completion of feasible and practical mitigation.

382. The proposed Wolverton Creek Structure consists of three lines of 10 foot by 10 foot box culverts, located approximately 500 feet downstream from existing box culverts under 180th Ave S., and will allow for reasonable navigation. Current navigation on Wolverton Creek upstream and downstream of the project is limited due to multiple road crossings with culverts. The proposed crossing does not further impede the reasonable navigation of the stream. Therefore, the requirement of Minn. R. 6115.0231, subp. 2D is met.

383. There are no state trails near the proposed culvert extension and the project does not involve a bridge or walkway to an island, therefore, Minn. R. 6115.0231, subps. 2E and 2F are inapplicable.

384. The culvert extension is not a water intake or sewer outfall and, therefore, the requirements of Minn. R. 6115.0231, subp. 3 are inapplicable.

VIII. ANALYSIS OF STATUTORY AND REGULATORY REQUIREMENTS: DAM SAFETY

385. The DNR commissioner may not issue a public waters work permit and/or a dam safety permit if it is determined that the project plans are not reasonable, practical, and will not adequately protect public safety and promote the general welfare. Minn. Stat. § 103G.315, subd. 3.

386. The purpose of Minn. R. 6115.0300 to 6115.0520 is to "regulate the construction and enlargement of dams, as well as the repair, alteration, maintenance, operation, transfer of ownership, and abandonment, in such a manner as to best provide for public health, safety, and welfare." In reviewing the 2018 Application, the DNR has taken into consideration the purpose of the dam safety rules and has applied the dam safety rules so as to best provide for public health, safety and welfare.

387. In the application of the dam safety rules, the DNR shall be guided by the policies and requirements declared in Minn. Stat. § 84.083, and chapters 103A, 103B, 103E to 103G, and 116D. *See* Minn. R. 6115.0300. The DNR has reviewed the 2018 Application to determine compliance with the applicable dam safety rules and has also been guided by the policies and requirements in these additional specified statutes.

388. Minnesota's dam safety rules are intended to be implemented in a manner consistent with the goals and objectives of applicable federal and state environmental quality programs and policies. *See* Minn. R. 6115.0300. "To achieve this purpose," the commissioner has set forth in Minn. R. 6115.0300 to 6115.0520, "minimum standards and criteria for dam classification and identification of hazards to health, safety, and welfare for permits for dam projects." *Id*. The DNR has applied the standards and criteria set forth in these rules in its review of the 2018 Application for the Revised Project. In doing so, the DNR has considered the goals and objectives of applicable federal and state environmental quality programs and policies.

389. Regulation of the operation and maintenance of a dam for public health, safety, and welfare is vested in the commissioner. Minn. R. 6115.0380, subp. 1. *See also* Minn. R. 6115.0300 through 6115.0420, 6115.0450, 6115.0480, and 6115.0500. The DNR has the authority to issue a permit for the Revised Project's dam on the Red River. *See, e.g.*, Minn. R. 6115.0340, 6115.0350, and 6115.0410. In reviewing the 2018 Application, in making these Findings and Conclusions, and in issuing a final decision on the Permit, the commissioner of the DNR is exercising this regulatory authority in accordance with this and other applicable provisions of Minnesota law, taking into consideration public health, safety, and welfare.

390. As required by Minn. R. 6115.0410, subps. 3 and 8, the DNR has evaluated the applicable requirements for issuance of dam safety permits under Minnesota law, including requirements based on potential environmental impacts of the Revised Project. *See* ¶¶ 35 through 66.

A. The Dam is Properly Classified as a Class I Dam According to Minn. R. 6115.0340

391. All dams meeting the definition of "dam" under Minn. R. 6115.0320, subp. 5 are required to be classified by the DNR commissioner. Minn. R. 6115.0340. A Class I dam is a dam whose failure would result in "any loss of life or serious hazard, or damage to health, main highways, high-value industrial or commercial properties, major public utilities or serious direct or indirect, economic loss to the public." Minn. R. 6115.0340A.

392. As outlined in ¶¶ 150 through 166, the failure or improper operation of the Revised Project Red River Control Structure could result in death or injury and would damage main highways, commercial and industrial properties; adversely impact public utilities; and cause extensive damage to private properties. Because properties downstream of the Dam with federally-backed mortgages would no longer be required to carry flood insurance, failure of the Dam would likely cause catastrophic economic loss to inundated property owners. The Red River Control Structure component of the Revised Project, therefore, meets the definition of a Class 1 (high hazard) dam as set forth in Minn. R. 6115.0340A.

393. Because there is a Class I dam involved, the DNR must evaluate the Revised Project and alternatives in light of their potential impacts on upstream and downstream populations; quantifiable benefits provided by the proposed Project; and impact of the proposed Project on the health, safety and welfare of the public. Minn. R. 6115.0410, subp. 8. Additionally, the DNR must consider whether the Revised Project represents the minimal impact solution to address flooding in the F-M metropolitan area. Minn. R. 6115.0200, subp. 5C, 6115.0240, subp. 3(5), 6115.0250, subp. 1a and 6115.0410, subp. 8. Finally, the DNR must consider whether there is a feasible and prudent alternative to the proposed Project without relying on economic considerations alone. Minn. Stat. Ch. 116B and Minn. Stat. § 116D.04, subd. 6.

B. The Permit Application Satisfies the Requirements of Minnesota Rules 6115.0410, Subparts 2 and 3

394. All applications for public waters permits, including a dam safety permit, are required to be in writing on a form prescribed by the commissioner. Minn. Stat. § 103G.245, subd. 3 and Minn. R. 6115.0240.

395. As set forth in ¶¶ 21 and 100, the Permit Applicants submitted a permit application for a dam safety and public waters work permit through the MPARS system and meets the requirements of Minn. Stat. § 103G.245, subd. 3 and Minn. R. 6115.0240.

396. The 2018 Application includes the name and address of the prospective owner, the dam purpose, the size location, type and height of the dam; and the storage capacity of the impoundment as required by Minn. R. 6115.0410, subp. 2.

397. The 2018 Application must also include a preliminary report that includes a general statement indicating the effect of the project on the environment; maps showing the specific location of the project; a report outlining the topographical and geologic surface conditions; a cross section of the dam showing elevations, proposed impoundment levels and top width; boring logs; preliminary design assumptions; preliminary cost estimates; future plans on ultimate project size including dams and the impoundment area; and a general description of all other activities and elements related to and part of the total dam project. Minn. R. 6115.0410, subp. 3.

398. The preliminary report submitted by the Permit Applicants includes all of the relevant documentations required by Minn. R. 6115.0410, subp. 3. *See* ¶ 107 and 2018 Permit Application.

C. The Permit Application Satisfies the Requirements of Minn. R. 6115.0410, Subparts 4 and 5

399. Minnesota Rule 6115.0410, subp. 4 and Minn. Stat. § 103G.301, subd. 2 require that the application must include a filing fee. As indicated in MPARS, the Permit Applicants paid the required $1000 filing fee on April 17, 2018. *See* ¶¶ 102 and 264.

400. Minnesota Rule 6115.0410, subp. 5, requires that a permit applicant retain a qualified Minnesota registered professional engineer, or an officer or employee of the United States as provided in Minnesota Statutes, section 361.13, who is proficient in dam safety engineering. The Permit Applicants retained the USACE to prepare the engineering documents, plans, and specifications; to inspect construction; and to establish operation and maintenance procedures. The engineer who signed the plans in the application is Michael Bart. The DNR concludes that the Permit Applicants have satisfied the requirements of Minn. R. 6115.0410, subp. 5.

D. The Permit Application Satisfies the Requirements of Minn. R. 6115.0410, Subparts 6 and 7

401. Minnesota Rule 6115.0410, subp. 6 requires that, upon acceptance of and agreement with the preliminary report, the permit applicant shall submit the final design report together with plans and specifications for the dam.

402. The final design report shall include:

> A. [A] general description of the project, such as its service life, production rates, required storage and area(s); geological considerations such as physiography, topography, geology, seismicity, groundwater conditions, and maps; hydrologic studies such as physical features, climatology, design, storm and design flood characteristics, flood routing, water-material balance, free-board requirements, dam-break flood; geotechnical information, such as rock-soil sampling and

logging, geophysical investigations, field and lab testing, instrumentation data; considerations of construction materials and their properties, such as quantities required, borrow and aggregate locations and volumes, field and lab work and investigations, concrete, waste materials generation and placement techniques, investigation of the stored waste materials such as generations, transportation, mechanical/chemical/special testing, disposal practice" Minn. R. 6115.0410, subp. 6A.

B. [A]nalytical determinations, such as seepage and underseepage studies, stability, deformation and settlement analysis; analytical and design details of facilities, such as dam, foundation, impoundment, abutments, spillways (for the purpose of these rules, spillway means any facility appurtenant to the dam available to discharge excess water and/or waste from the impoundment) or decant facilities, diversions, outlet works, instrumentation; operational aspects, such as impoundment operating criteria, initial filling criteria, responsibility and coordination, emergency procedures and warning systems: air, water, and solid pollution controls, sedimentation, and erosion controls: operational and post-operational maintenance and abandonment considerations; surveillance and inspection programs" Minn. R. 6115.0410, subp. 6B.

C. "[A] detailed cost estimate." Minn. R. 6115.0410, subp. 6C.

403. The Permit Applicants have submitted a Final Design Report, as well as detailed plans and specifications, for the Diversion Inlet Control Structure. *See* 2018 Application, Attachment 8 Diversion Inlet Control Structure Final Design Report. The Diversion Inlet Control Structure is the proposed first phase of construction of the Dam and is entirely in North Dakota. Construction of the Diversion Inlet Control Structure was started but was stopped in 2017 as described in ¶ 27. The Final Design Report for the Diversion Inlet Control Structure contains the detailed analysis and design required in Minn. R. 6115.0410, subp. 6.

404. Neither final design reports nor detailed plans and specifications have been submitted for any part of the Red River Control Structure in Minnesota. The final design of the Dam will use USACE regulations, manuals, and technical letters. *See* USACE Dam Design Guidance. The use of the USACE dam safety design guidelines is consistent with the engineering requirements of Minn. R. 6115.0410, subp. 6 - 7.

405. In some instances, where a permittee has adequately addressed the core requirements related to public health, safety, and welfare, and presented a minimal impact solution, the DNR will consider conditional approval of portions of a project prior to submission of a final design report as outlined in ¶¶ 121 through 123. As further discussed in ¶¶ 409 through 428, the DNR has concluded that the Revised Project meets the applicable public health, safety, and welfare considerations. Additionally, the DNR, in ¶ 280, has determined that the Revised Project is the minimal impact solution that meets the need to reduce historic flood risk potential and long term flood risk of flooding in excess of the 100-year flood.

406. As with many aspects of the design and construction of a project of this size and complexity, approval of various aspects of dam design and construction involves an iterative process between the permitting authority and the applicant. This process does not and should not stop at the moment the permit is issued. As additional information becomes available, the DNR may require further information or impose additional requirements. The DNR may require design modifications if necessary to meet regulatory requirements. Minnesota Rule 6115.0410, subp. 12 allows for impoundment approvals for various stages of construction.

407. As outlined in ¶¶ 121 through 123, the Revised Project will be managed using a phased permitting approach. Thus, while DNR does not currently have the Final Design for the Red River Control Structure, the Southern Embankment, the Eastern Tieback Embankment, or the Wolverton Creek Structure, the Permit is conditioned upon the submission and approval of a final design for these features prior to commencement of construction. *See* Permit condition 32.

408. No construction of any phase of the Dam can proceed without specific written authorization from the DNR. *See* Permit condition 32. As the final design for any phase of construction is completed, the Permit Applicants shall submit a final design report to the DNR for review and approval. All parts of the Dam need to be considered as one structure.

E. The Permit Application Satisfies the Requirements of Minn. R. 6115.0410, subp. 8

409. It is the intent of the State to regulate the construction, operation, maintenance, and transfer of ownership of any dam "in such a manner as to best provide for public health, safety, and welfare." Minn. R. 6115.0300. The purpose of the State's dam safety rules is to, among other factors, "set forth *minimum* standards and criteria for dam classification and identification of hazards to health, safety, and welfare for permits for dam projects." *Id*. (emphasis added).

410. Minnesota Rule 6115.0410, subp. 8, mandates that approval or denial of a dam safety permit "shall be based on the potential hazards to the health, safety, and welfare of the public and environment including probable future development of the area downstream or upstream. The applicant may be required to take measures to reduce risks, and the commissioner shall furnish information and recommendations to local governments for present and future land use controls to minimize risks to downstream areas."

411. The owner of a dam is required to operate and maintain the dam in conformance with standards adopted by the commissioner to ensure the public health, safety and welfare. Minn. R. 6115.0380, subp. 1.

412. The DNR reviewed and analyzed the potential hazards from a breach of the Dam. Detailed breach analysis results are included in the 2018 Application for both a hypothetical breach during the 100-year event and for a hypothetical breach during an event larger than the 500-year event. *See* ¶¶ 150 through 166.

413. The 2015 estimated population of the F-M metropolitan area was over 233,000 residents. *See* 2016 FOF ¶ 123. Under the 2016 Project, the USACE concluded that the vast majority of the population at risk during a breach would have at least 60 minutes' advance warning in the event of a breach. The duration of flooding, short time for evacuation, number of people who would need to be evacuated from the F-M metropolitan area, long evacuation routes (if even available) and potentially ice cold water would present unique challenges in moving people in the F-M metro area to safety in the event of a breach. Absent an evacuation action plan (i.e., a contingency plan or emergency action plan) demonstrating otherwise, DNR believes the USACE's estimated loss of life rate of 0.02% (2 fatalities for every 10,000 people at risk) for depths of flooding up to 13 feet appears to be low. In its 2016 FOF, the DNR concluded that the lack of an evacuation plan and inadequate advanced warning was insufficiently protective of public health and safety. 2016 FOF ¶ 123.

414. The 2018 Breach Analysis provides additional details as compared to the 2016 Project. The 2018 Breach Analysis indicates that the population protected by the in-town levees would have between 10 and 100 hours to evacuate. The DNR concludes that this is a more reasonable evacuation time frame. However, DNR remains concerned that if development is permitted within the shadow of the Dam and along the river channels, public health and safety would be endangered due to the limited warming time and higher flow velocities. Therefore, pursuant to Minn. R. 6115.0410, subp. 8 the commissioner recommends that communities prohibit development within one quarter mile of the Dam. *See* Permit condition 45. Minnesota has no jurisdiction to regulate North Dakota land use; however, DNR recommends that North Dakota limit development in the shadow of the Dam.

415. The Federal Flood Control Act relieves the federal government of liability for damages attributed to flood waters. 33 U.S.C. 702c. This includes liability for the breach of dams designed in whole or part by the USACE to reduce flood risk, where the breach is associated with a flooding event. *See* e.g., *Aetna Inc. Co*. v. U.S. 628 F.2d 1201 (9th Cir. 1980) cert. denied 450 U.S. 1025 (holding U.S. government immune from liability for injuries from collapse of the Teton Dam because the project was, in part, a flood risk reduction project). Therefore, in the case of the Revised Project, the dam owner(s) would be solely liable should the Dam fail. It is uncertain whether the non-federal Permit Applicants have sufficient capital to address the related financial implications of a failure. The Diversion Authority, a Permit Applicant responsible for operating the Dam, is not a governmental unit within the meaning of the Minnesota Tort Claims Act and, therefore, does not have a statutory limit on liability. The financial implications of a dam failure are magnified by the fact that property owners in the shadow of the Dam would no longer be required to carry flood insurance. The failure to provide adequate recompense in the event of Project failure would jeopardize, the public welfare as required by Minn. Stat. § 103G.315, subp. 3 and Minn. R. 6115.0300 and 6115.0410, subp. 8. Therefore, DNR remains concerned that if development is permitted within the shadow of the Dam and river channels, public health and safety would be endangered. Therefore, pursuant to Minn. R. 6115.0410, subp. 8, the commissioner recommends that communities prohibit development within one quarter mile of the Dam, also referred to as "the dam shadow". *See* Permit condition 45. While Minnesota has no jurisdiction to regulate North Dakota land use, DNR recommends that North Dakota limit development in the shadow of the Dam.

416. Development plans in the area upstream or downstream of the Dam were not included in the 2018 Application.

417. Between the years 2020 and 2040, Fargo's projected growth is expected to require just under 11 square miles. Over 60% of the City's growth by the year 2040 is expected to be within existing city limits and just over 30% (approximately 4 square miles) is estimated to require the unincorporated extra-territorial boundaries. Fargo Growth Plan, 2007.

418. Flood insurance is required for all structures within the FEMA identified 100-year (1% annual flood risk) floodplain that have a federally-backed mortgage. Structures that are mapped in the floodplain on the current maps would require flood insurance for federally-backed mortgages until the project is completed and the LOMR is submitted, approved by FEMA, and finalized. The effective BFEs would be used for insurance determinations, until a LOMR or a restudy is finalized. If a structure is above the effective BFE, there is no mandatory insurance requirement, though many structures outside of identified 100-year floodplains are damaged every year in the United States. After construction of the Revised Project, the structures upstream of the Dam that will be in the 100-year floodplain will be elevated or acquired. These structures are identified in the PRAM.

419. As required by Minn. R. 6115.0410, subp. 8, the DNR will provide information and recommendations to local governments for present and future land use controls to minimize risks to downstream areas. DNR will also provide information regarding future land use control upstream of the Dam. *See* Permit Condition 45.

420. The FFREIS does not include a comprehensive analysis of the adverse economic impacts to the upstream communities. Additional information was, therefore, included in the State FEIS. A review of both documents indicates that development would not be allowed in the upstream storage area. This would have an adverse economic impact on the region upstream of the Dam. Land and property values would be adversely impacted in the storage area. Flooding in the storage area would also adversely impact land productivity and organic farming practices. The development restrictions and decline in land value would adversely impact the property tax base of the region. Additionally, the Revised Project would require a number of area residents to relocate. Residents within the upstream communities would be expected to experience short- and long-term stress and anxiety associated with construction and operation of the proposed Project. The Revised Project would require road closures and alternate routes to services and would impact water supply and wastewater infrastructure. Social connectivity and identity would also be negatively impacted. *See* State FEIS § 3.16.

421. The Federal EIS shows an overall NED Benefit Cost Ratio (BCR) of 1.76 based on a project cost of over $1.7 billion on the 2016 Project, average annual benefits of over $174 million, and average annual costs of over $100 million. *See* Federal EIS at ES-15. The State FEIS did not calculate a NED BCR. On August 1, 2016 the State's consultant, Alexander Aaron, Inc., calculated a NED BCR of 0.58 using the Federal fiscal year 2016 discount rate and AAD

reduction in benefits of $41 million derived from FEMA's HAZUS model. The State analysis did not account for the increase in estimated project costs from $1.7 billion to $2.2 billion, which would decrease the BCR to less than 0.50. Using the methodology of the state's consultant, the 2016 Project's costs outweighed its benefits.

422. The Federal BCR for the 2016 Project incorporates benefits that are provided by the current flood risk reduction project plus emergency measures in the F-M metropolitan area. The Federal BCR does not break out the "added value" created by the proposed Project from the value provided by existing permanent flood risk reduction plus emergency measures. Thus the Federal BCR overstates the incremental benefits of the 2016 Project because a number of benefits that are claimed as project benefits are currently provided by present flood risk reduction plus emergency measures and are not added benefits of the proposed 2016 Project.

423. The USACE did not revise its BCR for the 2018 Revision. Minnesota Rules Ch. 6115 does not require that DNR evaluate the public welfare using a cost benefit analysis. The cost benefit analysis helps allocate public investment efficiently, and is not necessarily utilized as a public welfare metric. The Governors' Task Force recognized that the F-M metropolitan area is a regional economic hub and significant damage to the F-M metropolitan area would have negative repercussions on future economic growth, business expansion, job creation, and social vitality of the region. *See* Task Force Report at 9. The DNR concludes, therefore, that the Revised Project may prevent these negative consequences to the economic and social welfare of the region.

424. The owner of a dam is required to operate and maintain the dam in conformance with standards adopted by the commissioner to ensure public health, safety and welfare. Minn. R. 6115.0380, subp. 1. *See* ¶¶ 429 through 433.

425. The Revised Project relies on timely and successful operation of the Diversion Inlet, Wild Rice River, and Red River Control Structure gates. As described in further detail in ¶¶ 88 through 96, the control gates will regulate how much flow is diverted, how much flow goes down the natural river channels, and how much water gets stored upstream of the dam. The gates will need to be operated under difficult river conditions (e.g., ice, debris). Operators will rely on an Operation and Maintenance Plan, which is currently in draft form and is scheduled to be modified. *See* 2018 Application and Permit conditions 29 through 31(requiring submission and approval of the multiple plans related to operation and maintenance prior to completion of construction of the Revised Project).

426. Minn. R. 6115.0490 requires Class I dam owners to prepare a contingency plan and file it with DNR for approval. The contingency plan should provide for notifying any persons whose lives, property, or health may be endangered by failure, misoperation, or other circumstances or occurrence affecting the dam. The permit conditions require the applicant to submit and regularly update the contingency action plan. *See* Permit condition 28 (requiring the submission of the contingency plan and DNR approval prior to operation of the Revised Project).

427. The DNR has concluded that any hazards to the health, safety, and welfare of the public and the environment that would potentially be associated with the dam, including any arising from probable future development, are not likely to be significant. *See* ¶¶ 409 through 426.

428. As set forth in ¶121, ¶¶ 150 through 166, ¶ 308, and ¶¶ 409 through 427, the DNR has evaluated the potential hazards to the health, safety, and welfare of the public and the environment associated with the dam proposed in the 2018 Application and finds that the Revised Project with associated mitigation measures as set forth in ¶ 274 is protective of the health, safety and welfare of the public and the environment as required by the meaning of Minn. R. 6115.0410, subp. 8.

F. The Dam Shall be Operated and Maintained According to Minn. R. 6115.0380 and 6115.0390

429. The owner of a dam is required to operate and maintain the dam in conformity with Minn. R. 6115.0380, subp. 1 (requiring dam owners to design, construct, operate, and maintain dams to protect the public health, safety, and welfare).

430. The Hydrology and Hydraulics Report includes a draft Operation and Maintenance Plan. *See* 2018 Application Attachment 11 Hydrology and Hydraulics Report. Operation of the gates would occur for the 20-year flood and for greater floods. *See* ¶¶ 88 through 96.

431. The DNR is authorized to impose recordkeeping and reporting requirements on the applicant. Under Minn. R. 6115.0380, subp. 2 and Minn. R. 6115.0510, DNR may require dam owners to "keep records and report on maintenance, operation, staffing, and engineering and geologic investigations and any other data necessary to protect the public health, safety, and welfare." *Id*. In addition, dam owners must "fully and promptly advise the Commissioner of DNR of any unusual or alarming circumstance or occurrence affecting the dam." *Id*. The Permit imposes various recordkeeping and reporting requirements on the Permit Applicants. *See* Permit conditions 25, 27 through 31, 33 through 36, 40, 43 and 52. Minn. R. 6115.0510 states that, "When necessary to assess the safety of a dam or proposed project, the applicant or owner may be required to submit additional information at personal expense."

432. Minnesota's dam safety rules also direct that dam owners "…shall perpetually maintain the dam and appurtenances to ensure the integrity of the structure". Minn. R. 6115.0390, subp. 1. The Permit requires the Permit Applicants to maintain the dam in perpetuity. *See* Permit conditions 39 and 41.

433. As set forth in ¶¶ 424 through 428, the DNR has reviewed the 2018 Application and supporting documents, together with the Permit, and determined that the Permit Applicants

will be required to operate and maintain the dam in conformance with the applicable dam safety regulations, thereby assuring that the dam is designed and will be constructed and operated in a manner to protect public health, safety and welfare.

G. The Permit Application Contains the Material Required by Minn. R. 6115.0410, Subpart 8A-8F

434. Under Minn. R. 6115.0410, subp. 8, DNR must also "determine if the proposal is adequate with respect to":

> A. For Class I, a showing of lack of other suitable feasible and practical alternative sites, and economic hardship which would have a major adverse effect on population and socioeconomic base of the area affected.
>
> B. For Class II, a showing of lack of other suitable feasible and practical alternative sites and that the dam will benefit the population or socioeconomic base of the area involved.
>
> C. The need in terms of quantifiable benefits.
>
> D. The stability of the dam, foundation, abutments, and impoundment under all conditions of construction and operation, including consideration of liquefaction, shear, or seepage failure, overturning, sliding, overstressing and excessive deformation, under all loading conditions including earthquake. This determination must be based on current, prudent engineering practice, and the degree of conservatism employed must depend on hazards.
>
> E. Discharge and/or storage capacity capable of handling the design flood based on current, prudent engineering practice and the hazard classification.
>
> F. Compliance with prudent, current environmental practice throughout its existence.

435. As set forth in ¶¶ 391 through 393, the DNR has identified the dam as a Class I Dam.

436. Minnesota Rule 6115.0410, subp. 8A requires that, prior to permitting a Class I dam, the permit applicant must make a showing that there is a "…lack of other suitable feasible and practical alternative sites." The permit applicant must also make a showing that failure to construct the project would have a major adverse effect on the population and the socioeconomic base of the area affected by the project.

437. The DNR, in environmental review, considered whether other suitable feasible and practical alternative dam sites exist to determine whether the proposal is adequate, in accordance with Minn. R. 6115.0410, subp. 8A. *See* ¶¶ 167 through 176.

438. The social and economic consequences of the Project were detailed and analyzed during environmental review and referenced in the 2018 Application. *See* State FEIS § 3.16 and Final SEIS § 3.10. *See also* ¶¶ 47 through 66 and ¶¶ 190 through 204.

439. Minnesota Rule 6115.0410, subp. 8C requires the commissioner to determine if the project is needed in light of the quantifiable benefits of the project.

440. DNR has considered the need for the dam in terms of the quantifiable benefits, taking into consideration the anticipated socioeconomic benefits. *See* ¶ 1, ¶ 29, ¶¶ 55 through 66, ¶ 69, ¶¶ 190 through 204 and ¶ 365. *See* State FEIS § 3.16 and Final SEIS § 3.10. Based on its analysis, the DNR concludes that the Project will provide significant quantifiable economic and socioeconomic benefits, addressing demonstrated flood risk reduction needs of the F-M metropolitan area.

441. Minnesota Rule 6115.0410, subp. 8D and 8E, requires the commissioner to determine the adequacy of the proposed dam's stability and capacity of the dam under all conditions of construction and operation.

442. DNR has examined the "stability of the dam, foundation, abutments, and impoundment," under all the conditions outlined in Minn. R. 6115.0410, subp. 8D. As set forth in ¶¶ 120 through 124, the Revised Project will be permitted in phases. The DNR has received and evaluated the final design of the Diversion Inlet Structure and finds the design of the Diversion Inlet Structure meets the requirements of Minn. R. 6115.0410, subd. 8D. As set forth in Permit condition 32, construction of each of the Revised Project elements is conditioned on the submittal and approval of a design that meets the requirements of Minn. R. 6115.0410, subp. 8D.

443. The DNR has examined the adequacy of the dam with respect to discharge and/or storage capacity capable of handling the design flood based on current, prudent engineering practice and the hazard classification as outlined in Minn. R. 6115.0410, subp. 8E. The Dam is capable of safely passing the Probable Maximum Flood event, which is the design flood.

444. Minnesota Rule 6115.0410, subp. 8F, requires the commissioner to assess the proposed dam's "compliance with prudent, current environmental practice throughout its existence." As set forth in ¶ 274, the Revised Project as mitigated meets this requirement.

445. The DNR has determined the Revised Project, as proposed and permitted, will satisfy Minn. R. 6115.0410, subp. 8, and is adequate with respect to compliance with prudent, current environmental standards and with sound engineering practices throughout its existence. *See* ¶¶ 134 through 166, ¶¶ 198 through 204, and ¶¶ 221 through 232. The Permit will require ongoing monitoring and maintenance to ensure the stability of the dam and the adherence to permitting requirements into perpetuity. *See* Permit conditions 30 through 31 and 38 through 42. Written approval must be obtained from the DNR prior to construction of any phase of dam construction. *See* Permit condition 32. The Permit will also require the completion of required

mitigation prior to completion of the Revised Project. *See* Permit conditions 25 through 27, 44, and 47 through 50.

IX. DNR HAS DETERMINED THAT THE ISSUANCE OF THE PERMIT COMPLIES WITH MERA

446. The Minnesota Environmental Rights Act ("MERA") requires the DNR to consider whether the conduct that is to be permitted will result in "pollution, impairment or destruction of natural resources." Under MERA, no conduct that results in pollution, impairment, or destruction of natural resources shall be authorized unless there is no feasible and prudent alternative. Minn. Stat. § 116B.09, subd. 2. "Pollution, impairment, or destruction" under MERA "is any conduct by any person which violates, or is likely to violate, any environmental quality standard, limitation, rule, order, license, stipulation agreement, or permit of the state or any instrumentality, agency, or political subdivision thereof which was issued prior to the date of the alleged violation occurred or is likely to occur or any conduct which materially adversely affects or is likely to materially adversely affect the environment." *Id.*, § 116B.02, subd. 5.

447. In reviewing the record and the 2018 Application, the DNR considered the quality and severity of any adverse effects of the proposed action on the natural resources that might be affected by the Revised Project, including any potential long-term adverse effects to those resources, the types of resources at issue, the potential significant consequential effects of the proposed dams on other natural resources, and the direct and consequential impacts of the proposed dams on the affected resources. *See State ex rel Schaller v. County of Blue Earth*, 563 N.W.2d 260, 267 (Minn. 1997).

448. The Permit requires the Permit Applicants to secure all required environmental authorizations and comply with all other applicable legal requirements.

449. As detailed in these Findings and Conclusions, the construction, operation, and maintenance of the Revised Project in accordance with the Permit will comply with all applicable state and federal environmental protection standards, including, without limitation, the requirements of Minn. Stat. chapter 103G and Minn. R. chapter 6115 governing dam safety and work in public waters. The potential effects on natural resources resulting from the Revised Project were extensively evaluated in the State FEIS and Final SEIS. The Permit issued pursuant these Findings of Fact requires the Permit Applicants to secure all applicable permits and to comply with all other applicable legal requirements. In light of the foregoing, the DNR concludes that the work authorized by the Permit, subject to these conditions contained therein, will not result in pollution, impairment, or destruction of natural resources in violation of MERA.

450. As outlined in ¶¶ 446 through 449, the DNR has considered the proposed construction, operation, and maintenance under the Permit in accordance with MERA, and determines that the Permit satisfies the applicable statutory requirements.

Based upon the above, the DNR makes the following:

CONCLUSIONS

1. Minnesota Statutes § 103G.315, subd. 2 requires that the commissioner to make findings of fact on issues necessary for determination of the applications considered. Orders made by the commissioner must be based upon findings of fact made on substantial evidence.

2. If the commissioner concludes that the plans of the applicant are reasonable, practical, and will adequately protect public safety and promote the public welfare, the commissioner shall grant the permit. Minn. Stat. § 103G.315, subd. 3. The permit "applicant has the burden of proving that the proposed project is reasonable, practical and will adequately protect public safety and promote the public welfare." Minn. Stat. § 103G.315, subd. 6.

3. Minnesota Statute § 103G.311 subd. 1 provides that the commissioner shall hold a contested case hearing on a public waters work permit or a dam safety permit unless expressly waived by the commissioner pursuant to Minn. Stat. §103G.311, subd. 4.

4. The commissioner is precluded from issuing a public waters work permit, including a dam safety permit, which causes pollution, impairment, or destruction of the air, water, land, or other natural resources so long as there is a feasible and prudent alternative consistent with the reasonable requirements of the public health, safety, and welfare. *See* Minn. R. 6115.0250, subp. 1a.

5. As set forth in Part VII, the commissioner has met the requirements set forth in ¶¶ 1 through 4 of these conclusions as it relates to the public waters work permit.

6. In order to issue a work in public waters permit, the DNR must find that, the proposed Project "represents the 'minimal impact' solution to a specific need with respect to all other reasonable alternatives and does not exceed more than a minimum encroachment, change, or damage to the environment, particularly the ecology of the waters." *See* e.g., Minn. Stat. § 103G.245, subd. 7, Minn. R. 6115.0200, subp. 5C, and Minn. R. 6115.0250, subp. 3(5).

7. Minnesota Rule 6115.0410, subp. 8 requires that, in issuing a dam safety permit, the DNR must analyze "the potential hazards to the health, safety, and welfare of the public and the environment" posed by the Revised Project. As set forth in ¶¶ 55 through 66, ¶¶ 134 through 139, ¶¶ 150 through 166, ¶¶ 190 through 204, ¶¶ 221 through 232, ¶¶ 237 through 238, ¶¶ 385 through 390,¶¶ 409 through 428, and ¶¶ 437 through 445, the DNR has undertaken this analysis for the Revised Project as mitigated.

8. To issue a dam safety permit for a Class I dam, the DNR must find the "lack of other suitable feasible and practical alternative sites, and economic hardship which would have a major adverse effect on population and socioeconomic base of the area affected. *See* Minn. R. 6115.0410, subp. 8A. As set forth in ¶¶ 16 through 17, ¶ 29, ¶¶ 47 through 66, ¶¶ 167 through 176, ¶¶ 190 through 204, ¶¶ 257 through 260, ¶ 273, ¶280, ¶ 284, ¶ 323, ¶375, ¶393, ¶¶ 420 through 423, and ¶¶ 436 through 440, the DNR has undertaken this analysis and determined that there is a lack of suitable feasible and practical alternatives to the Revised Project as mitigated.

9. To issue a dam safety permit, the DNR must assess the need for the project in terms of quantifiable benefits. *See* Minn. R. 6115.0410, subp. 8C. As set forth in ¶ 37, ¶¶ 81 through 82, ¶ 105, ¶ 288 through 289, ¶ 365, ¶ 420 through 423, and ¶ 439 through 440, the DNR has undertaking this analysis for the Revised Project as mitigated.

10. In order to issue a dam safety permit, the DNR must assess the engineering features of the dam relating to its stability and storage capacity as set forth in Minn. R. 6115.4010, subp. 8D and 8E. As set forth in ¶¶ 120 through 124, ¶ 278, and ¶¶ 441 through 443, the DNR has undertaken this analysis for the Revised Project as mitigated.

11. In order to issue a dam safety permit, the DNR must consider whether the Revised Project will comply with prudent, current environmental practices throughout its existence. Minn. R. 6115.4010, subp. 8F. As set forth in ¶¶55 through 66, ¶¶ 134 through 139, ¶¶ 190 through 204, ¶¶ 221 through 232, and ¶ 274 the DNR has undertaken this analysis for the Revised Project as mitigated.

12. Several F-M flood risk reduction projects have been subject to extensive review and public input over the course of the past ten years. The review included the preparation of numerous federal environmental review documents as well as a state EIS and supplemental EIS, all of which were subject to public review and comment. Additionally, the Governors of Minnesota and North Dakota convened the Governors' Task Force to assess project alternatives. The Governors' Task Force was composed of representatives from impacted and benefited communities. Given the breadth of study and input gathered over the ten-year history of project deliberation, the commissioner has concluded that a contested case hearing would be unlikely to bring forward new information that would aid the commissioner in resolving disputed facts material to the permit issuance. Therefore, pursuant to Minn. Stat. § 103G.311, subd. 4, the commissioner expressly waives a contested case hearing.

13. Notwithstanding the conclusion set forth in ¶ 12, Minn. Stat. § 103G.311, subd. 5 authorizes specified LGUs the right to a contested case hearing by filing a demand for hearing within thirty days after mailed notice of this order.

14. For the reasons set forth in ¶ 2 and ¶¶ 4 through 11 of this conclusion, the DNR finds that the Revised Project with mitigations adequately protects the health, safety and welfare of the public, represents the minimal impact solution, and is reasonable and practical. The DNR further finds that the Revised Project has significant environmental impacts that are mitigated and that said mitigation is an express requirement of the Permit. Finally the DNR finds that the

Revised Project with mitigation meets the requirements for a dam safety and public waters work permit.

15. Any findings that might properly be termed Conclusions and any Conclusions that might properly be termed Findings are hereby adopted as such.

ORDER

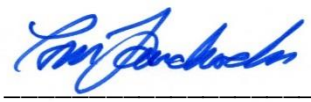
Based upon the Findings of Fact and Conclusions contained herein and the entire record of the proceedings:

1. The Minnesota Department of Natural Resources hereby determines that Dam Safety and Public Waters Work Permit Application 2018-0819 for the proposed Fargo-Moorhead Flood Risk Management Project, in Clay and Wilkin Counties, Minnesota, and Cass and Richland Counties, North Dakota, is hereby GRANTED.

This Order is a final Order appealable pursuant to Minn. Stat. Ch. 14. If the Permit Applicants wish to appeal this decision, they must file a written request for a contested case hearing pursuant to Minn. Stat. § 14.57 *et. seq*. within 30 days of receipt of the permit decision letter. The demand for hearing must be accompanied by a $500 surety bond or cashier's check made out to Minnesota Department of Natural Resources. After 30 days, no further appeals may be made. The hearing request and bond or check should be sent to Jack Gleason, Hearings Coordinator, DNR Ecological and Water Resources Division, 500 Lafayette Road, St. Paul, MN 55155.

Approved and adopted this 27th day of December.

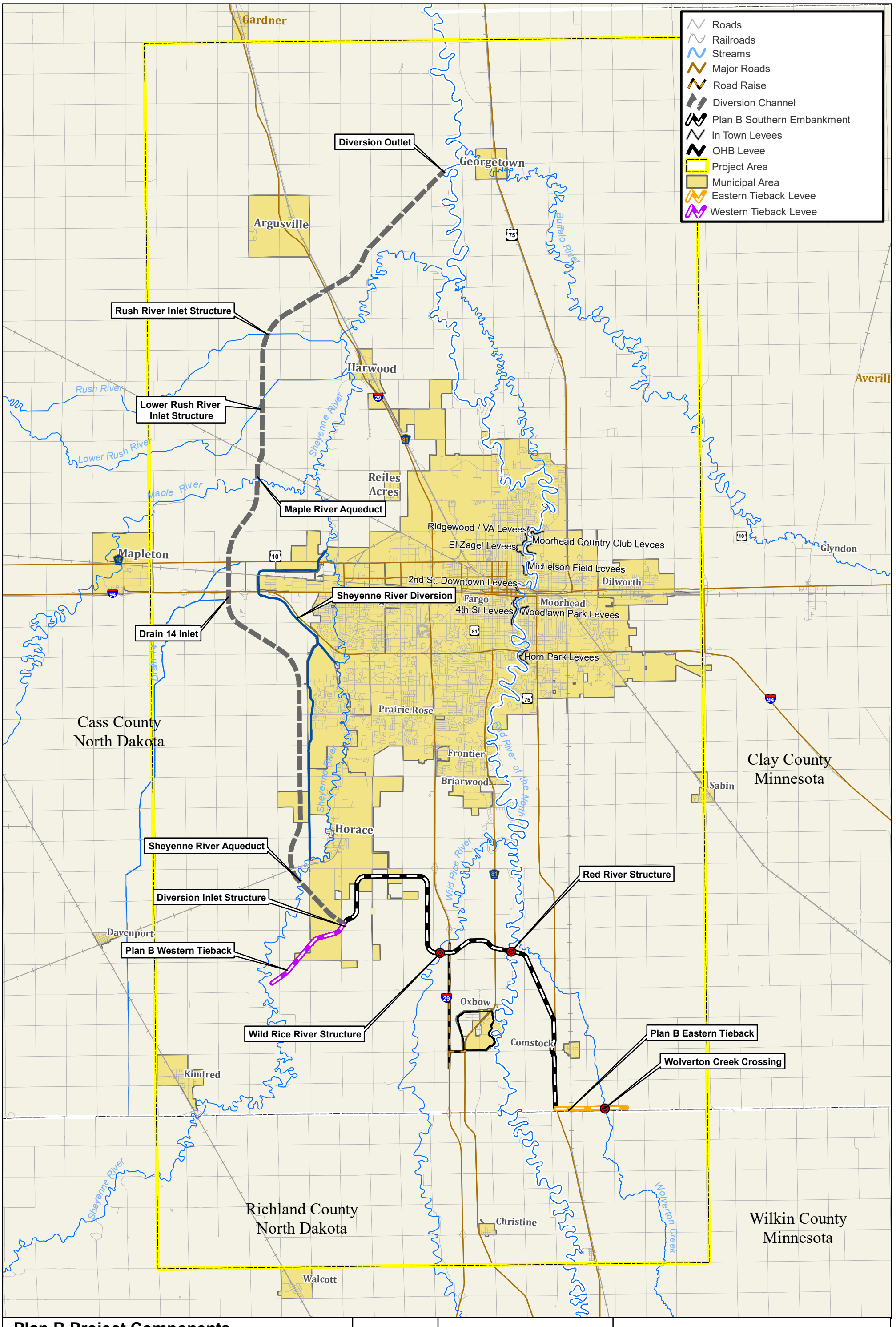
STATE OF MINNESOTA
DEPARTMENT OF NATURAL RESOURCES



_____

TOM LANDWEHR
Commissioner
Minnesota Department of Natural Resources

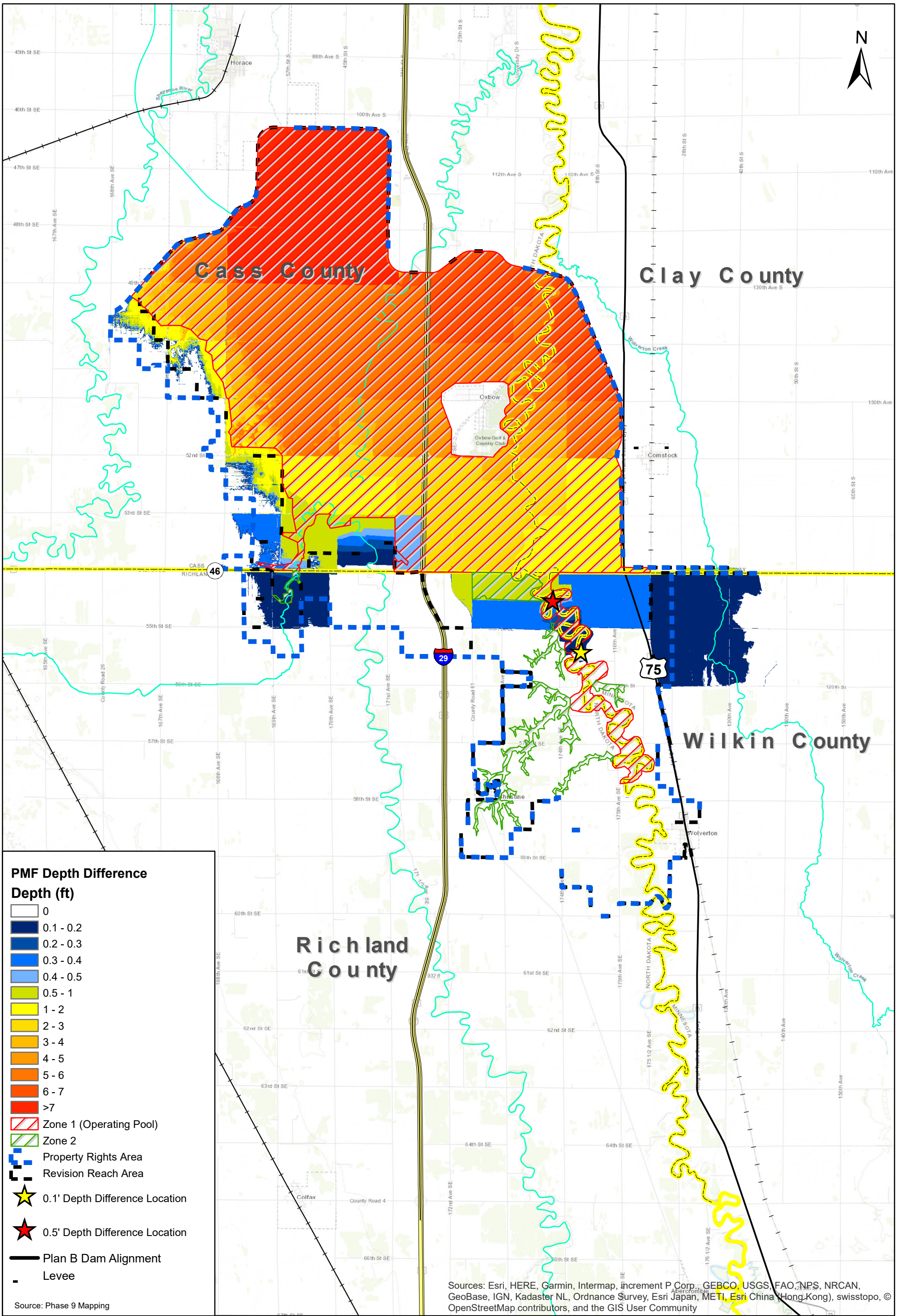
ATTACHMENT 1



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

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

Attachment 2



Plan B - PMF Depth Difference Map

Created By: dkirkpatrick Date Created: 5/25/2018 Date Exported: 11/21/2018 Image: ESRI World Topographic Elevation Data: USACE DEM
Coordinate System: NAD 1983 UTM Zone 14N Datum: North American 1983
H:\Fargo\JBN\7400\7438\18_7438_0026\GIS\Maps\PMF_DepthDifferenceMap.mxd

HMG

Attachment 3

FM Inundation Table

November 29, 2018

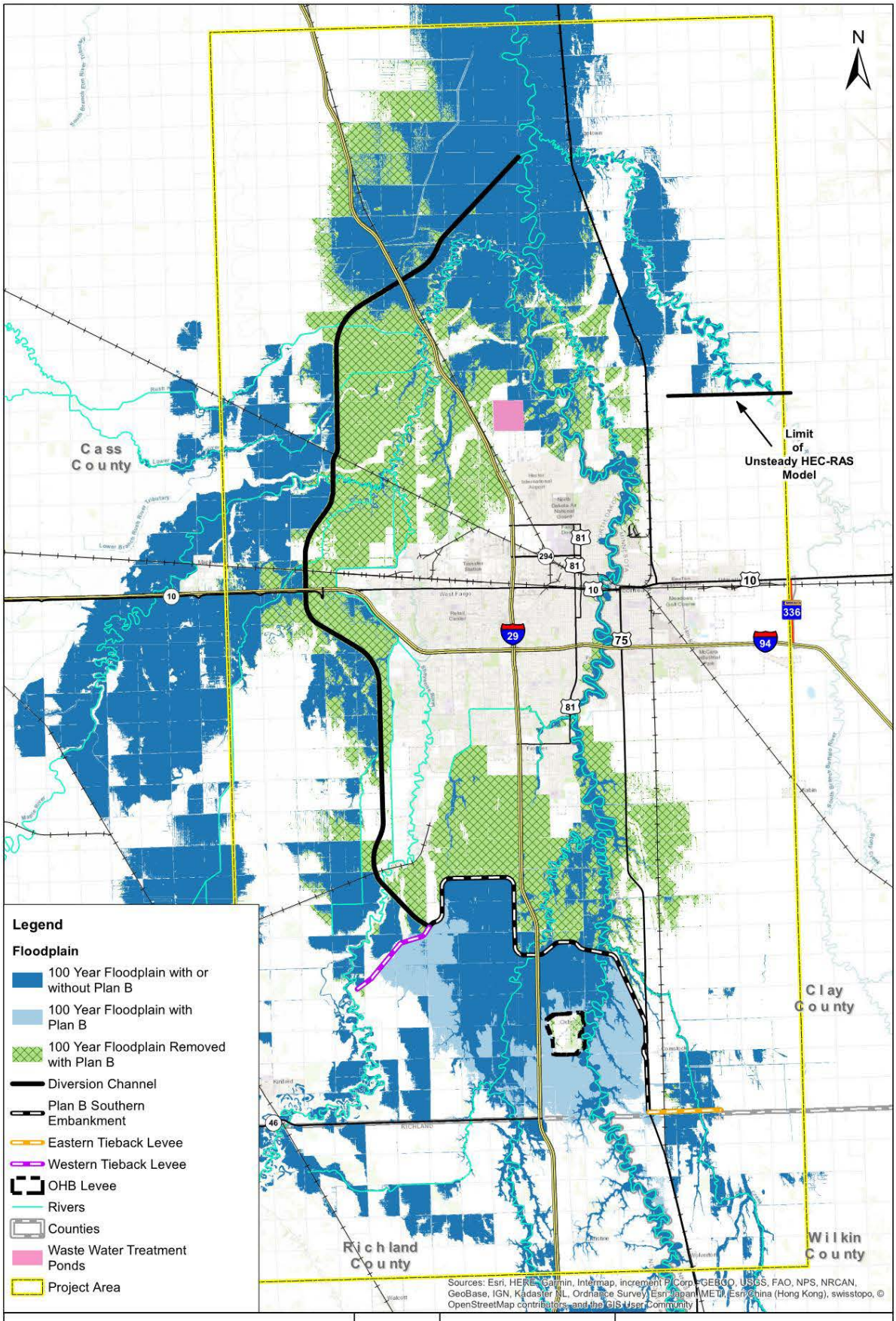
	Total Project	Minnesota	North Dakota
Existing 100 year inundation	168,786 acres	39,503 acres	129,282 acres
100 year flooding removed by project	56,882 acres	9,635 acres	47,247 acres
x	111,904 acres	29,868 acres	82,035 acres
100 year inundation with project	123,954 acres	33,545 acres	90,409 acres
100 year inundation with project - x	12,050 acres	3,677 acres	8,374 acres
Newly inundated by project	12,050 acres	3,677 acres	8,374 acres

Calculations are based on the “Project Area” (see Figure 2).

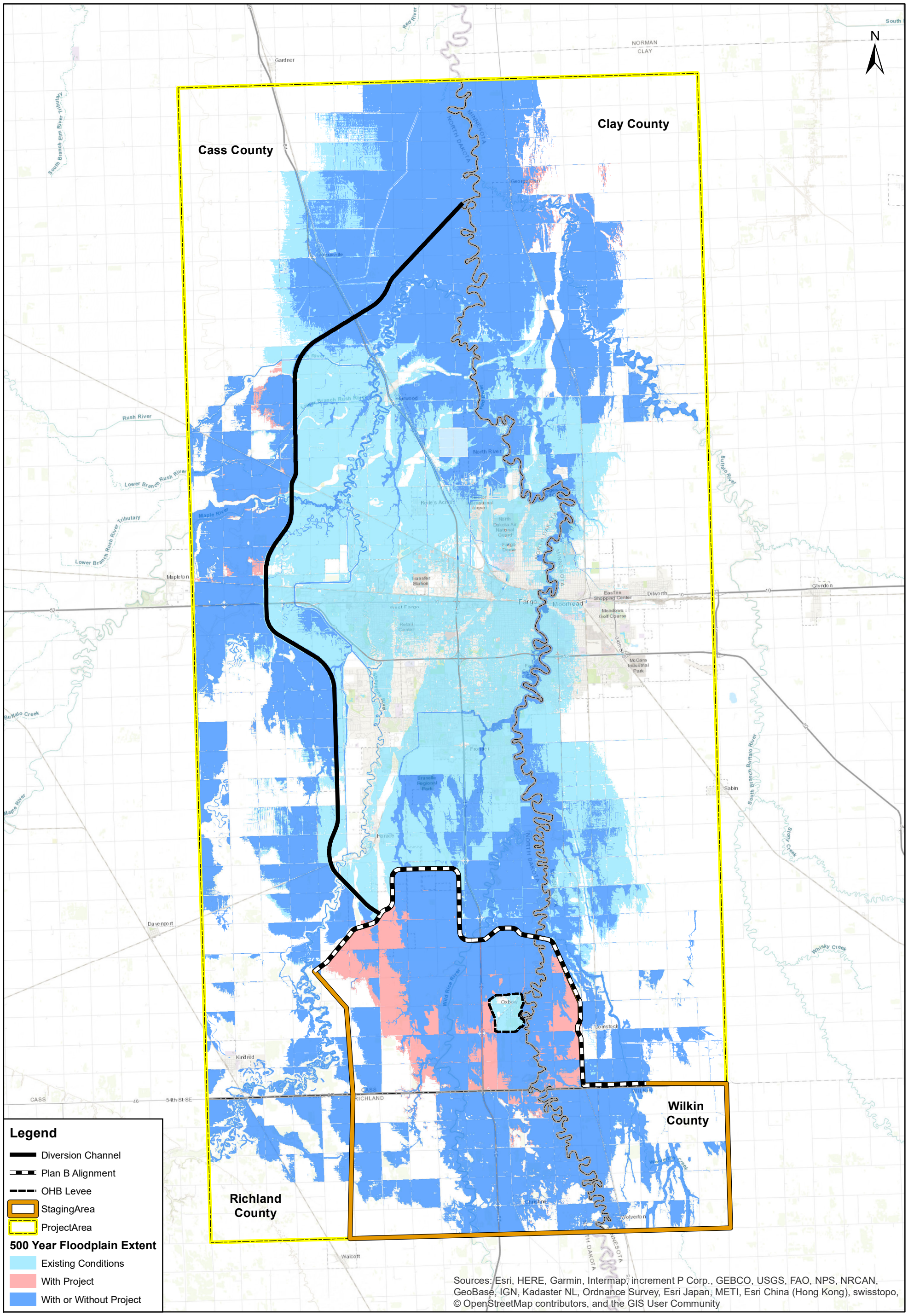
Formula for calculations:

Existing 100-yr inundation – 100-yr flooding removed by project = X

100-yr inundation with project – X = Acres newly inundated by project


N
Limit of Unsteady HEC-RAS Model
Cass County
Clay County
Richland County
Wilkin County
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
Created By: enelson Date Created: 05/31/2018 Date Exported: 6/10/2018 Image: ESRI Topo Basemap Elevation Data: -
Coordinate System: NAD 1983 UTM Zone 14N Datum: North American 1983
H:\Fargo\JBN\7400\7438\18_7438_0026\GIS\Maps\Figure2_3_PlanB_Inundation.mxd
N
W
E
S
0 1 2 4
Miles
Figure 2

ATTACHMENT 4



FARGO-MOORHEAD FLOOD RISK MANAGEMENT PROJECT

500 Year Floodplain Existing Conditions and with Plan B

Created by: Forward K. Date Created: 12/12/2018 Exported Date: 12/12/2018

DEPARTMENT OF NATURAL RESOURCES

0 1.25 2.5 5 Miles

Source: Phase9_Polygons_Updates.gdb, ExCond_CombRPTP_FP_500yr, WP_CombRPTP_FP_500yr
Coordinate System: NAD 1983 UTM Zone 14N

DEPARTMENT OF NATURAL RESOURCES

Ecological and Water Resources
500 Lafayette Road, St. Paul MN 55155

April 27, 2018

Michael Redlinger
Metro Flood Diversion Authority
200 3rd Street North
Fargo, ND 58102

Mr. Redlinger,

This is to acknowledge that on March 16, 2018, we received a permit application from the Metro Flood Diversion Authority for the Fargo-Moorhead Metropolitan Area Flood Risk Management Project. We have designated the application as #2018-0819 and have invoiced and received payment ($1,000) for the permit application.

Additional Information Needs

We have completed an initial review of the application and determined that we need some additional information to proceed with next steps. We have included a document entitled *Information Needed* that identifies additional items we'll need from you before we send your application to Local Governments for their review. The items needed include additional maps and mapping details, references updated to reflect the current application, explanation of how the project addresses Minnesota law, operations details, and additional details on the proposed Red River control structure. The *Information Needed* document also includes a preliminary list of other items that will be needed as we progress through the application review process.

Environmental Needs Determination

After reviewing the proposed project reflected in your application, the DNR has determined that there are substantial revisions to the proposed project that was evaluated in the Fargo-Moorhead Metropolitan Area Flood Risk Management Project EIS (adequacy determination June 2016). Furthermore, these changes affect the potential significant adverse effects of the project. The substantial revisions include: 1) the realignment of the southern embankment that would change miles of direct footprint impact as well as a substantial shift in the proposed inundation area of the project, 2) modification to operation of the control structure and 3) using the entire period of record to calculate the 100-year flood event. As a result of these changes, per the Minnesota Environmental Policy Act, the DNR will need to prepare a Supplemental Environmental Impact Statement (SEIS) prior to making a decision on the permit application.

SEIS Process

The first formal step in this process is for DNR to publish an SEIS preparation notice that includes a proposed scope of what will be evaluated in the SEIS. This notice begins a 20-day public comment period for persons to

submit objections to the proposed scope. After considering these comments, DNR will proceed with drafting the SEIS. Responses to comments received on the proposed scope will be included in the draft SEIS. The draft SEIS is subject to an approximate 30-day comment period that includes a public informational meeting. Following the informational meeting on the draft SEIS, the process is the same as for a typical EIS, including preparing a Final SEIS and responses to comments, followed by DNR's adequacy determination.

We are aware that the U.S. Army Corps of Engineers plans to prepare a Supplemental Environmental Assessment (EA) to determine if a federal SEIS is needed. DNR intends to rely on technical analysis prepared for the U.S. Army Corps of Engineers' Environmental Assessment to the degree these federal analyses cover the state's scoped issues and we can support the data, methodology and conclusions of those analyses. DNR also intends to use information developed during the SEIS process to support consideration of the permit application. To the maximum extent possible, DNR's SEIS and application evaluation will occur simultaneously.

As you are likely aware, the first step for beginning an EIS is to execute an income agreement between the Diversion Authority and DNR to compensate staff time and actual costs for preparing the SEIS. At your earliest convenience, we would like to consult with both the Diversion Authority and the U.S. Army Corps of Engineers regarding the proposed scope of the federal and state environmental review. This will allow us to develop an estimated cost and income contract for execution.

If you have questions, please contact me at 651-259-5674 or Julie.ekman@state.mn.us.

Sincerely,

Julie Ekman

Julie Ekman, Manager
Conservation Assistance & Regulations Section

CC: Nathan Boerboom, City of Fargo
Bob Zimmerman, City of Moorhead
Terry Williams, U.S. Army Corps of Engineers

Enclosure

Information Needed – Permit Application 2018-0819
April 27, 2018

The following information is needed prior to preparation of DNR's request for Local Government comments on the permit application

General application needs

1) Need additional maps of proposed project showing impacts and alignment.
2) Need detailed upstream staging area mapping, including identification of any roadway or railroad embankment that would act as a dam during operation.
3) Need updated references. There appear to be several carryover references from the Diversion Authority's previous application. Documents that reference such things as the MN Diversion alignment and the completed State EIS and Federal EIS may no longer be applicable and should be updated to provide clarity to the reviewers. Need to delete any other old reference material to the previous project that is no longer applicable.
4) Need discussion of how the project could meet MN rules for public waters and dam safety, including but not limited to minimal impact solution; comparison to current conditions; use of nonstructural floodplain management measures; alternate sites; consistency with water and land use plans of local government units; and prudent, current environmental practice.
5) O&M Plan - How much flow goes downstream when starting operations?
6) O&M Plan - What is maximum rate of rise and fall of water levels, both in staging area and downstream? What is the natural rate?

Preliminary Design Report

1) Page 12 - Clarification if 41.5' with levees means emergency levees or what levee configurations?
2) Page 12 – Need more detailed analysis of Hydrology and Hydraulics for new 100-year flood.
3) Page 13 Table F.1 – 50-year Period of Record 26,000 cfs and gage 39.8' doesn't quite match the flow of 28,000 cfs expected for stage of 40.0' on page 19.
4) Page 16 - Need clarification of the elevation of western tie-back (lower than top of dam but above PMF pool level) and the eastern tie-back.
5) Page 20 – Need to also include a separate attachment for Operation and Maintenance Plan. All references should be updated, with out-of-date material removed.

Public Waters

1) Need a map and cross-sections showing the location, extent, and depth of the proposed fill and excavation.

Property rights acquisition plan

1) When in 2018 will the formation of Moorhead-Clay County Joint Powers Authority for condemnation occur?

The following is a preliminary list of information that will be needed prior to DNR's decision on an application. These items need further discussion between the Diversion Authority and DNR.

General application needs

1) Need additional details on the estimated stability of the proposed dam and the Red River Control Structure. Example: If no soil borings will be available for the new alignment until Phase 3, need a discussion of the applicability of already completed soil borings and estimated soil parameters on the dam design. Include factors of safety.
2) Need additional detail on alignment of the embankment.
3) Need additional detail on location of the Red River Control Structure and excavated channel.
4) Need a list of engineering manuals, regulations, and technical letters used in the design. Is there a reference for structural design assumptions separate from Structural Design & Criteria for each phase?
5) Need design factors of safety for seepage and stability.
6) Need preliminary design for controlling seepage.
7) Need draft specifications for dam embankments.
8) Need instrumentation and monitoring plan.
9) Need dam breach inundation map.
10) Need a draft Water Control Manual, including a water control plan.
11) Need a draft Operation, Maintenance, Repair, Replacement, and Rehabilitation manual.
12) Need a preliminary stable channel design to prevent scour and allow fish passage at the Red River control structure and at the diversion outlet.
13) Need updated project cost.

Public Waters

1) Need a project narrative that describes how the project satisfies public water work permit requirements in Minnesota Rules 6115.0150 through 6115.0280, in particular the sections on filling, excavation, structures, water level control structures, and application for public water work permits.

Dam Safety/Risk

1) Need to continue to refine dam breach analysis and have Agency discussions.
2) Need final consequence analysis with currently proposed alignment.

   a. Discuss need for a dam breach analysis during a more frequent but lower flood event.
   b. Need detailed analysis on the potential for the levees downstream to overtop, including assumptions about low spots and openings.
   c. Need maps showing water depths and depth x velocity, both with and without a breach.
3) Risk analysis – Need discussion. Comparison of risk (hazard, performance, consequence) with existing conditions versus risk with proposed project.

Property rights acquisition plan

1) Does FEMA/USACE Coordination plan from 2015 need to be revised?
2) TBD needs identified during review by others (legal review, full description of property rights, debris, funding, private wells/septic).

Environmental mitigation plan

1) Need analysis of connectivity impacts.
2) Need updates to Mitigation Plan after a decision is reached on impacts of the currently proposed project, such as the need to re-evaluate Drayton Dam and WR River Dam projects that were to be used as mitigation.
3) TBD needs identified by others (Adaptive Management and Monitoring Plan measures, monitoring, funding).
4) Review July 27, 2016 letter for details on mitigation plan.

Floodplain

1) Need details on period record hydrology, including 2009 versus 2017.
2) Need details regarding any stage increase downstream and impacts downstream.
3) Need details regarding impact of current levees on stages upstream. Do in-town levees increase stage upstream? Do in-town levees increase the stage downstream due to removal of floodplain storage, or do they decrease the stage downstream due to flow constriction?
4) TBD needs identified during ER (revision reach, takings analysis, floodplain management; CLOMR?).