



**US Army Corps
of Engineers®**
St. Paul District

Comments and Responses Appendix F

Fargo Moorhead Metropolitan Area
Flood Risk Management Project

EA Document

This page is intentionally left blank

Comments and Responses

Appendix F

Table of Contents

1	Public Comments on EA.....	1
2	Comment Category A: Plan Formulation	2
3	Comment Category B: Analysis and Effects	8
4	Comment Category C: Design and Operation.....	19
5	Comment Category D: Project Implementation and Schedule.....	24
6	Comment Category E: Other	31

Comments and Responses

Appendix F

1 Public Comments on EA

The Draft Supplemental Environmental Assessment dated June 2013 was released for a 30 day public review on June 12, 2013. The review period closed on July 15, 2013. The review period generated a number of questions and comments on the Draft Supplemental EA and covered a wide range of topics. These comments are provided in Appendix E. The comments have been separated into these categories:

- A. Plan Formulation (address alternatives such as distributive storage, additional impoundments, ring dikes)
- B. Analysis and Effects (Hydrology and Hydraulics modeling, area of effects, floodplain effects, significance of effects)
- C. Design and Operation (drainage, road alignments, tieback levees, height of floodwall, who operates)
- D. Project Implementation and Schedule (coordination/permits, buyouts – when, where and how, timeline)
- E. Other (page specific, kudos)

All comments have been reviewed by the Corps of Engineers. Many comments are unique and many are reiterated by multiple individuals. In an attempt to provide more clear and understandable responses, comments have been condensed, paraphrased, and addressed once. These comments appear in the subsequent sections as categorized above. Many of the responses provide a general overview and then direct the reader to the location within the Final Supplemental Environmental Assessment (EA) or Final Environmental Impact Statement (FEIS) where more detailed information can be found. Comments not directly related to the proposed project modifications presented in the EA are marked with an asterisk (*).

2 Comment Category A: Plan Formulation

*A-1: Basin-wide solution

Several comments suggested that the diversion channel and associated features are not the best solution. One comment referenced a comment made by the St. Paul District Commander about Minot, ND needing a basin wide solution to flooding and asked why the proposed project is not looking at similar solutions. Another comment stated that if the process outlined in the 1998 Mediation Agreement were followed the project would not have taken its current form. Instead the project would have gone through a work group and have a basin-wide perspective, which would have resulted in a plan that would benefit more than the Fargo-Moorhead area.

Response: Basin-wide flood risk reduction protection is not the purpose of this project. As stated in Sections 1.2 and 2.5 of the FEIS, the purpose and scope of the Project is to implement measures to reduce flood risk and flood damages in the Fargo-Moorhead Metropolitan area. The Corps and other agencies continue to investigate measures that could be implemented throughout the basin to help reduce overall flood risk, but that is not the intent of this study or project. No basin-wide solution has been found to be as cost effective, complete, or efficient at reducing flood risk for the Fargo-Moorhead area as the proposed diversion project.

The Corps is committed to basin-wide flood risk reduction. The Corps already has many projects in place, including reservoirs at Lake Traverse, Orwell Lake, and Lake Ashtabula that have significantly reduced flood risk in the Red River basin. Since June 2008, the Corps has invested more than \$5 million in the Red River Basin-wide Watershed Study in partnership with local governments, the International Water Institute and the Red River Basin Commission. That study has generated detailed topographic mapping, hydrologic modeling, and other tools to help local water resource managers. Retention throughout the Red River Basin is being investigated by numerous agencies and could be built without federal financial assistance.

A-2: EIS is needed

Several comments stated the EA was not adequate and an Environmental Impact Statement (EIS) should be initiated to fully document and capture the proposed modifications.

Response: The FEIS allowed for tiering supplemental NEPA documentation as permitted by Council on Environmental Quality (CEQ) Regulation 40 C.F.R. 1508.28 (see section 1.2 of the FEIS). As stated in Section 1.0 of the EA, the proposed modifications would result in some changes in the location, timing, and magnitude of effects on some resources, but there would not be an appreciable change in the overall types and scope of impacts from what was described in the FEIS. Therefore, an EA is appropriate.

*A-3: Smaller retention not investigated

Several comments suggested that smaller retention sites around the basin should be investigated and implemented in lieu of the larger staging area. The Red River Basin Commission outlined a distributed

storage plan that would reduce peak flows on the Red River by 20%. This would reduce the 100-year flood stage at Fargo by at least 1.5 feet, which would not nearly meet the current Fargo stage reduction goal, but it is possible that greater than a 20% reduction could be achieved. The assertion that distributed storage would have less flow reduction for larger floods is unsupported; current design philosophies suggest the effect would be similar for larger floods.

Response: As described in Chapter 3 and Appendix O of the FEIS, alternatives for the Project have been thoroughly evaluated. For example, upstream retention and storage were eliminated as standalone alternatives but were retained as alternatives for inclusion in possible combination plans with diversion channels and levees. As described in Section 8.4 of Appendix O of the FEIS, the Corps considered 384 different combinations of measures during the feasibility phase.

Regarding distributed storage, a number of studies have been conducted to investigate the benefits of retention along the mainstem of the Red River of the North. These studies include:

- **Red River Basin Commission – Long Term Flood Solutions for the Red River Basin, September, 2011.** The Red River Basin Commission issued their final report on Long Term Flood Solutions (LTFS) for the Red River Basin in September, 2011. The LTFS study evaluated storage requirements in the Red River Basin to achieve a 20% flow reduction of 1997 peak flows along the Red River mainstem. The LTFS study showed this reduction is achievable, and estimated 125,000 acre-feet of storage would be required upstream from Wahpeton/Breckenridge to achieve this goal, which would result in a stage reduction of approximately 2.4 feet at Wahpeton/Breckenridge during a simulated 1997 flood event. Similarly, the LTFS showed an estimated storage of 240,000 acre-feet would be required upstream from Fargo/Moorhead to achieve the 20% reduction goal, which would result in a stage reduction of approximately 2.3 feet at Fargo/Moorhead during a simulated 1997 flood event. The 1997 flood event at Fargo is now considered less than a 2-percent chance event by the Corps.
- **U.S. Army Corps of Engineers – Fargo-Moorhead and Upstream Feasibility Study.** Modeling performed by the Corps estimated that a system of impoundments with 200,000 to 400,000 acre-feet of storage could reduce the flood stage at Fargo-Moorhead by 1.6 feet for a 32,000 cfs flood event, which is slightly less than a 1-percent chance event defined by the Corps.
- **Phase 3 of this Project.** Initial design and planning for the Project resulted in downstream impacts that were deemed unacceptable. These impacts varied from 6 inches to 2 feet on the Red River of the North for the 1-percent chance event, depending on the location and width of the floodplain. Houston Engineering, Inc. and Moore Engineering, Inc. performed an evaluation for the Southeast Cass Water Resource District to determine the amount of retention that would be needed to mitigate the downstream impacts. The study results were presented to the FM Metro Flood Study Work Group on March 4, 2010 and showed approximately 215,000 acre-feet of effective storage would be needed to mitigate the downstream impacts. The effective storage was computed where the major tributaries enter the mainstem of the Red River. The

study estimated this would equate to 400,000 to 600,000 acre-feet of distributed storage throughout the Red River watershed upstream from Halstad, MN.

- **Wild Rice River Retention Studies.** Local Water Resource Districts in North Dakota have completed a sensitivity analysis for the 2009 flood event on the Wild Rice River that demonstrated how distributed storage is not a viable option to replace the storage component of the Project. Modeling showed that if this option were pursued for the Wild Rice River, nearly all of the distributed storage would need to be placed in eastern Richland County. Additionally, even if this occurred, the distributed storage would not be enough to replace the storage required for the Project. These results could also be applied to other tributaries and Wilkin County.

The results of these studies are fairly consistent and estimate potential benefits from upstream storage. These studies show that while some flood reduction benefits can be achieved on the Red River through retention, retention alone does not provide the desired level of flood protection for communities along the mainstem of the Red River. This includes Fargo-Moorhead as well as the communities of Oxbow, Hickson, and Bakke. This is why retention was eliminated as a stand-alone plan for a flood solution as part of the Final Fargo-Moorhead Metro Feasibility report and Environmental Impact Statement (July 2011). Similarly, the volume of retention needed farther upstream in the Red River watershed to mitigate downstream impacts from the Project would be significantly higher than the approximately 150,000 acre-feet of additional floodplain storage created by the upstream staging area.

***A-4: Wrong plan for the City of Fargo**

Several comments suggested that the proposed plan was not the right plan for Fargo. Comments stated that the City should implement levees and floodwalls through town, similar to Grand Forks-East Grand Forks, and that Fargo should implement small projects over time, similar to Moorhead and not pursue the diversion project.

Response: As described in Chapter 3, Alternatives, of the FEIS, flood barriers, similar to those implemented in Grand Forks-East Grand Forks, were eliminated from further consideration for several reasons. The cost of building flood barriers that would contain the 1-percent chance event with 90% assurance (Corps criteria) is very high since you either need to build barriers very high near the current emergency-measures alignment or build somewhat lower barriers farther away from the river which requires acquiring a significant amount of developed property. Historic properties would be impacted and a minimum of 1,000 structures would have to be removed. The residual risk involved in having over one hundred thousand people living behind a barrier that could be overtopped by events larger than the 1-percent chance event was also considered. With the Project, the upstream control structures reduce flows within the risk management area such that the flood stage will be 35.0 feet for the 1-percent chance event and no greater than 40.0 feet at the Fargo gage for events up to the Standard Project Flood (SPF), which is 103,000 cfs (the 0.2-percent event flow is 61,700 cfs). Without the upstream control structures and barriers (levees) containing flood flows, the stage at the Fargo gage would be 42.1 and 46.3 for the 1-percent chance event and the 0.2-percent chance event, respectively. With emergency protection, the stage at the Fargo gage was 40.8 for the 2009 flood. The chances of success

in fighting a flood larger than the 1-percent chance event are much greater with the Project than with a barrier-only system. Flood barriers are less effective and less cost effective than diversion channels in providing a high level of risk reduction.

A-5: Storage Area

Storage Area 1 should not have been eliminated as it was taking advantage of the natural flood plain to store flood water. Storage Area 1 was eliminated so the area could be developed.

Response: As stated in Appendix D of the EA, during the feasibility phase there appeared to be some benefit in having a storage area (Storage Area 1) separate from the rest of the staging area, but since the feasibility phase, modeling has shown that it would be very difficult and relatively expensive to realize the benefit of a separate storage area for the wide variety of potential flood scenarios that could threaten the Fargo- Moorhead metropolitan area. The southern alignment shift also moved the tieback embankment to the north, reduced the length of embankment classified by Minnesota DNR as Class I Dam, eliminated the need for the Wolverton Creek structure, and modified the diversion inlet control structure. These modifications will improve the operation of the diversion channel, reduce the overall project cost, and impact fewer landowners. Although the elimination of Storage Area 1, by itself, would result in additional land being taken out of the floodplain, when combined with shifting the alignment to the north, the additional amount of land being taken out of the floodplain is minimal.

A-6: Screening of southern alignment options

Commenter's questioned the validity of the rationale used to screen out the "North of the Wild Rice River (NWRR)" alternative alignment and the extent to which that alternative could have reduced downstream impacts and could reduce upstream impacts to Richland and Wilkin Counties.

Response: Revisions have been made in Appendix A of the EA to clarify why NWRR was screened out. All alternatives considered minimized downstream impacts by determining a required amount of storage needed to accomplish this goal. The impacts to Richland and Wilkin Counties have been reduced with the proposed project modifications presented in the EA.

A-7: Impacts to Richland and Wilkin counties

The FEIS and EA fail to describe options that avoid flooding Richland and Wilkin counties; options can still be explored because the Project has not been authorized or funded by Congress. Additionally other decision makers, such as the Minnesota Department of Natural Resources, need updated information to make informed decisions.

Response: The impacts to Richland and Wilkin Counties have been reduced as a result of changes that have been made since the FEIS, and mitigation for the impacts has been stated in the FEIS and EA. The modifications eliminate impacts for a 10-percent chance event. The impacts to Richland and Wilkin Counties were decreased: land within the staging area would be decreased to 788 acres in Richland County and to 450 acres in Wilkin County, and the number of residential structures in the staging area would be reduced from 18 to 2 in Richland County and from 2 to 1 in Wilkin County. Wilkin County

would see a 50% reduction of residential impacted structures, 59% reduction in newly impacted acres, and 97% of the impacts would be between 0-1 feet. Richland County would see an 87% reduction of residential structures, 55% reduction in newly impacted acres, and 94% of the impacts would be between 0-1 feet. Information on the various alternatives has been made public, and decision makers have the most current data to use to make decisions.

A-8: Damages to Richland and Wilkin counties

Damages to Richland and Wilkin counties could be reduced by combining all or some of the following measures: in-town levees, distributed storage, not eliminating Storage Area 1, and moving the staging area further north.

Response: The FEIS and EA state and quantify the impacts to Richland and Wilkin Counties. The modifications to the plan presented in the EA further reduce the impacts to Richland and Wilkin counties. As described in the EA, in town levees are proposed to be included as part of the Project. Distributed storage would not be as effective as described in comment A-3. Storage Area 1 was found to not be as effective as planned (see response to comment A-5). Moving the staging area farther north would impact a greater number of existing structures.

A-9: Further environmental review for Oxbow/Hickson/Bakke ring levee

The Oxbow/Hickson/Bakke ring levee has major environmental impacts that need to be further explored. The report should compare the ring levee to no flooding, not a complete buyout.

Response: The FEIS evaluated the impacts of acquiring the communities of Oxbow, Hickson, and Bakke. The impacts for the ring levee were identified, quantified, and evaluated in the EA. The EA is a tiered document to evaluate the impacts from the proposed modifications to the Federally Recommended Plan in the FEIS; the impacts from a complete fee acquisition for the three communities were already addressed in the FEIS, as was the no action alternative. It is worth noting that much of the area does experience flooding during larger events.

*A-10: Optimum solution

The optimum strategy may be to combine distributive storage, raising levees and setting back existing levees, using staging and storage area for larger flood event, and using a diversion channel as a last resort. These modifications could limit the impacts to Cass and Clay counties.

Response: The plan as proposed includes many of the suggestions listed above, including the use of in-town levees to carry additional flow through town, thus allowing the diversion channel to operate less frequently. The diversion channel is still required to provide permanent benefits for large flood events. The impacts of the Project are primarily contained to Cass and Clay counties. Impacts to Richland and Wilkin Counties have been reduced; see response to A-7 for the reduced impacts to Richland and Wilkin Counties.

***A-11: Level of protection**

The plan is to provide 500-year protection for an event that has never occurred and is less likely in future years. An EIS should be completed to describe what 100-year protection would be and let decision makers complete a trade-off analysis.

Response: The project is being designed for permanent protection up to the 1-percent chance (100-year) event and would significantly reduce flood damages and emergency related costs. A 0.2-percent chance (500-year) event would require emergency flood fighting efforts. Although the Fargo-Moorhead area has not seen a 0.2-percent chance event, it is important to prepare for extreme events. The FEIS documents the cost, benefits, and trade-offs of different levels of protection.

A-12: Comment about VE-13 selection

In section 3.3.1 of the EA it is stated that the estimated cost of the Oxbow Ring Dike is 65 Million dollars. In the September 13, 2012 Public Meeting Post-Feasibility Analysis packet on page 22 it says the VE13-A option had a cost savings of 53 Million dollars. The Oxbow Ring Dike came after the VE 13-A option is now costing an EXTRA 12 Million Dollars (53-65). The North of Wild Rice plus Oxbow Levee option was stated to have a 6 Million dollar savings. Actually it now has a 71 Million dollar savings over VE13-A option (6+65). The South of Oxbow option was stated to cost an extra 29 Million dollars. It now actually has a 36 Million dollar savings over VE13-A option that was picked (65-29). So what this now means is that you have picked the most expensive option and if you were to go with the North of Wild Rice plus Oxbow Levee option you would save 71 Million dollars over the current plan, correct?

Response: In comment A-12, the 65 Million dollar cost estimate for the Oxbow/Hickson/Bakke (OHB) ring levee is not consistently applied as a cost to the project and therefore the assertion that the most expensive option was selected is incorrect. In the second sentence, the OHB ring levee is expressed as a 65 Million dollar project cost. In the third sentence, the OHB ring levee is expressed 65 Million dollar project savings. In addition, the commenter failed to include the buyout savings to the project for protection of approximately 132 residences in OHB (VE-13A and NWRR options). The most expensive option was not chosen. Complete alternative analysis, assessment, and cost information can be found in Reference Document "Final Technical Memorandum for the FM Diversion Post-Feasibility Southern Alignment Analysis (PFSAA), dated October 10, 2012".

***A-13: State line dam**

We should be making more use of the state line dam near the Bois de Sioux River, including possibly improving it and adding retention on the Wild Rice River.

Response: Improvements to the White Rock Dam are outside of the scope of the Fargo-Moorhead metro project. Studies on retention on the Wild Rice River have been completed; see response to A-3.

3 Comment Category B: Analysis and Effects

B-1: Impacts to East Grand Forks

The City of East Grand Forks stated that the impacts of the Project on the city need to be mitigated.

Response: The existing and with-project hydrographs for Grand Forks and East Grand Forks are very similar, therefore stage and duration impacts are minor and the Federal project completed for the cities of Grand Forks and East Grand Forks will provide adequate protection from potential downstream impacts.

B-2: Impacts on water table

What impacts to the water table due to prolonged periods of inundation can be expected for land in the staging area in North Dakota and Minnesota?

Response: Due to the impervious nature of the soils in the Fargo-Moorhead area, infiltration of water is generally very slow. In the case of flood events, the duration of these events is very short compared to the time necessary for the flood water to infiltrate the ground to recharge the ground water table. Even the short increase in duration of flooding caused by the Project will not be enough to cause measurable changes.

B-3: Floodplain impacts

The loss or gain of protected floodplain is not presented in the report.

Response: As referenced in Section 5.2, Economic Effects, of the EA, the western alignment shift, elimination of Storage Area 1, and the Oxbow/Hickson/Bakke ring levee would increase the number of acres that would be removed from the floodplain. Conversely, shifting the southern alignment to move the tie back levee north and the northern alignment shift would reduce the number of acres removed from the floodplain. Overall, there would be no appreciable change to the quantity of land removed from the floodplain when compared to what was presented in the FEIS.

B-4: Executive Order 11988

Executive Order 11988 was not followed for the proposed project modifications. Executive Order 11988 was applied inconsistently as a reason for not moving the western alignment farther west, but ignored for protecting Fargo development with the southern alignment.

Response: Executive Order 11988 prohibits support of floodplain development if there is a practicable alternative. If no practicable alternative exists, then impacts to the floodplain must be minimized. As described in the EA, the proposed modifications would result in no appreciable change to the quantity of land removed from the floodplain when compared to what was presented in the FEIS. The proposed modifications are necessary to optimize the function, constructability, and safety of the diversion channel and to reduce environmental impacts of the Project.

B-5: Impacted farmland

How many acres of farm land will be lost due to the Project?

Response: As stated in Section 5.3, Natural Resource Effects, of the EA, the Project will impact approximately 8,000 acres of farmland, which is an increase of approximately 1,000 acres from what is described in the FEIS. This increase is largely due to the inclusion of temporary construction easements along the entire diversion channel, tieback embankments, overflow embankments, and connecting channel. Therefore, the increase is a worst-case-scenario, as not all of the farmland within the temporary construction easements may be impacted, and farming could resume following construction.

***B-6: Impact to Raymond Township**

Impacts of overland flooding in Raymond Township need to be addressed and included.

Response: Section 3.4, Project Description with Proposed modifications, of the EA, describes generally how existing drainage would be intercepted and directed into the diversion channel. The project goal is to maintain the existing 1-percent chance floodplain outside the diversion channel. Details in Raymond Township and other specific locations will be developed during the design phase of the Project.

***B-7: Tree and vegetation effects in staging area**

Will trees and vegetation survive long periods of saturation in the staging area?

Response: As referenced in Section 5.3, Natural Resource Effects, of the EA, project operation would typically occur during periods prior to leaf-on. This helps minimize stress on riparian trees and other plants that may be caused by increased water elevations in the staging area. With the addition of in-town levees, the Project and therefore the staging area would operate less frequently, further reducing stress on trees and vegetation in the staging area. Historical record indicates that Red River flows at the USGS Fargo gage have not exceeding 17,000 cfs during the summer months; based on this information it is unlikely that any, let alone long, periods of saturation would occur in the staging area during the growing season.

***B-8: Bank stability**

Assuming the Project would operate at a 100-year flood event without the full diversion being operational, how will extended saturation impact geomorphology impacts in the staging area?

Response: In accordance with Corps planning guidance, the impacts of the Project have been calculated based on a completed project. Control structure operation prior to having a completed project could have different impacts, would require an analysis to evaluate the potential change in effects, and may require additional NEPA documentation. The impacts of constructing in-town levees and the Oxbow/Hickson/Bakke ring levee are independent of the diversion channel.

***B-9: Wetland mitigation**

Is there alternative wetland mitigation if the proposed mitigation in the low flow diversion channel cannot be achieved?

Response: Adaptive management would be used to ensure the wetland mitigation is replacing the lost function of wetlands as intended, and modifications to the channel would be made if necessary.

B-10: Geomorphology

How will increased duration of water in the staging area impact the geomorphology?

Response: Current and historical geomorphic conditions in the project area were evaluated, along with potential geomorphic impacts associated with the project implementation.

The results from the geomorphic assessment of current and historical conditions indicate that the reaches in the study area saw very little geomorphic change over decades of time. This is due, in part, to the erosion resistant nature of the cohesive glacial soils and the sediment supply to the system. Future geomorphic impacts of the Project were assessed by evaluating each reach within the project area with respect to five geomorphic criteria: bank stability, channel migration rate, bank full depth, bank full width, and riparian vegetation. Predictions were made for how the Project would impact the criteria and if the combined impacts would result in a discernible change to geomorphology. For reaches within the staging area, the report predicted that bank stability and riparian vegetation would be affected, however, these impacts would only lead to minor changes to geomorphology relative to the system as a whole as stated in the EA.

B-11: Modeling

The HEC-RAS model needs to be calibrated to available discharge and high water mark information; the information provided in the EA depicts a surface water elevation change from the existing condition 100 year water surface elevation at Grand Forks. To further elaborate, although the latest study shows little relative significant impact(s) at the Grand Forks locations, these findings are predicated on a different baseline of conditions and models than the baseline on which the current Grand Forks flood protection project was designed and constructed. This difference needs to be clarified within the EA and presented in both current and future analysis.

Response: In response to this comment, the model has been extended to Drayton, ND and was re-calibrated. Now, the model is more closely calibrated to the high water marks from 2009. It also closely matches the specific events as presented in the Grand Forks County Flood Insurance Study (FIS). Figures 7 – 10 of Appendix D of the EA have been updated to reflect the recalibrated model.

For Grand Forks specifically, the tables and figure provided here show the 10-percent chance (10-year) event, 2-percent chance (50-year) event, 1-percent chance (100-year) event, and 0.2-percent chance (500-year) event discharges and elevations from the most recent Grand Forks FIS, the FEIS (feasibility study) and the Phase 7 modeling results used for the draft EA, and the recently updated Phase 7 results.

Of note, the Grand Forks FIS from 2010 presents the 1-percent chance event water surface at the USGS Gage 05082500 Red River of the North at Grand Forks, ND (Grand Forks Gage) to be 833.2 (NAVD88).

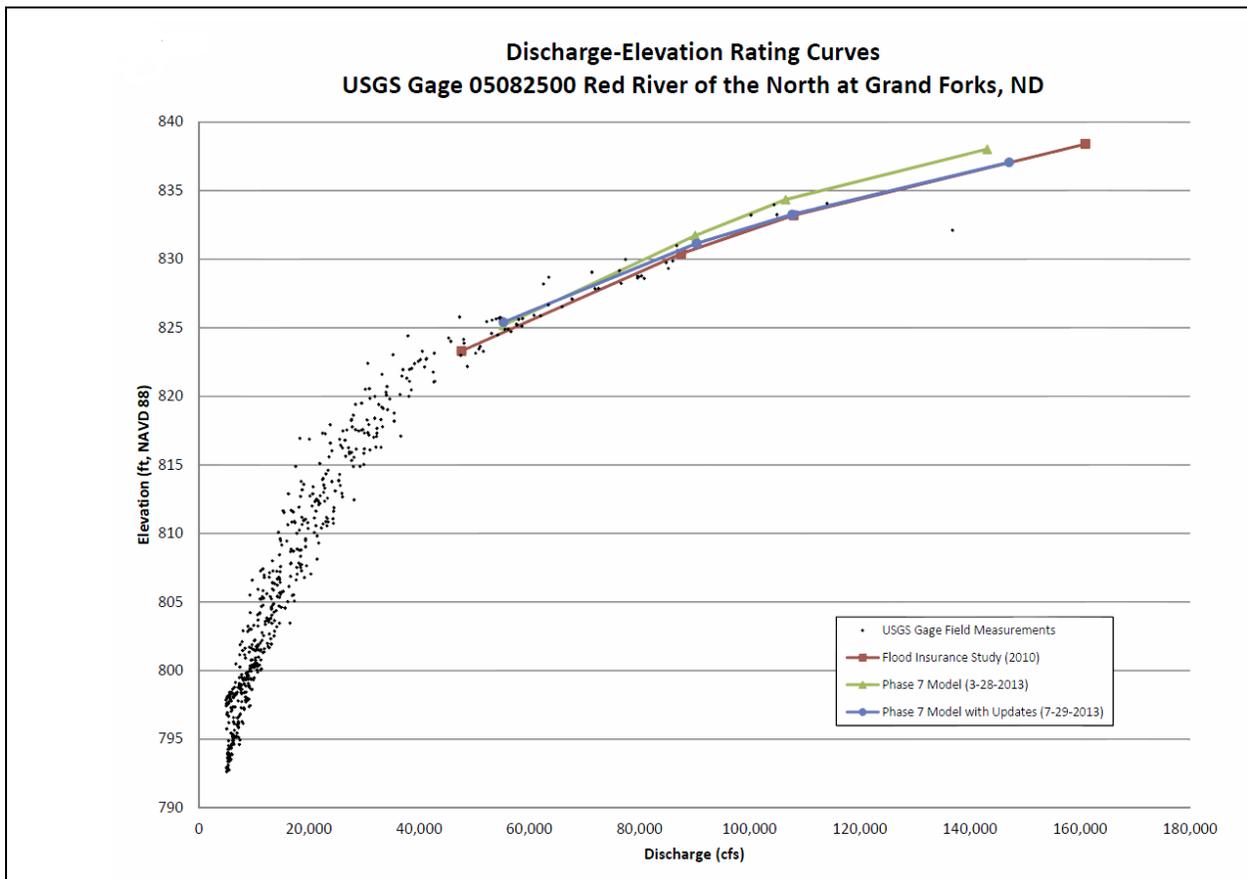
The updated Phase 7 model's 1-percent chance event stage is 833.4 (NAVD88). Although the absolute elevations of flood events at the Grand Forks gage were higher in the original Phase 7 modeling used for the draft EA than in the Grand Forks FIS and the updated Phase 7 model results, the relative project impacts are nearly the same (far right column of tables).

Grand Forks FIS compared to FM Metro (Feasibility and Phase 7)												
Flood Insurance Study (2010)			Phase 4 (Feasibility) Existing		Phase 4 (Feasibility) With Project			Phase 7 (3-28-2013) Existing		Phase 7 (3-28-2013) With Project		
Event Frequency	Discharge (cfs)	Elevation (ft)	Discharge (cfs)	Elevation (ft)	Discharge (cfs)	Elevation (ft)	Stage Increase (ft)	Discharge (cfs)	Elevation (ft)	Discharge (cfs)	Elevation (ft)	Stage Increase (ft)
10	47,700	823.3	56,662	825.98	57,169	826.09	0.11	55,317	825.18	55,524	825.22	0.04
50	87,600	830.4	91,118	831.13	92,619	831.31	0.18	90,125	831.72	90,816	831.84	0.12
100	108,000	833.2	107,980	832.97	110,497	833.21	0.24	106,567	834.35	107,249	834.44	0.09
500	161,000	838.4	146,225	836.36	149,112	836.58	0.22	143,162	838.03	145,510	838.25	0.22

Discharges obtained at USGS Gage 05082500, Red River of the North at Grand Forks, ND
All elevation reference NAVD 88

Grand Forks FIS compared to FM Metro (Feasibility and Phase 7 with Model Updates)												
Flood Insurance Study (2010)			Phase 4 (Feasibility) Existing		Phase 4 (Feasibility) With Project			Phase 7 (7-29-2013) Existing with Updates		Phase 7 (7-29-2013) With Project with Updates		
Event Frequency	Discharge (cfs)	Elevation (ft)	Discharge (cfs)	Elevation (ft)	Discharge (cfs)	Elevation (ft)	Stage Increase (ft)	Discharge (cfs)	Elevation (ft)	Discharge (cfs)	Elevation (ft)	Stage Increase (ft)
10	47,700	823.3	56,662	825.98	57,169	826.09	0.11	55,332	825.41	55,567	825.45	0.04
50	87,600	830.4	91,118	831.13	92,619	831.31	0.18	90,393	831.15	91,090	831.24	0.09
100	108,000	833.2	107,980	832.97	110,497	833.21	0.24	107,800	833.27	108,977	833.40	0.13
500	161,000	838.4	146,225	836.36	149,112	836.58	0.22	147,129	837.07	149,100	837.23	0.16

Discharges obtained at USGS Gage 05082500, Red River of the North at Grand Forks, ND
All elevations reference NAVD 88



B-12: Frequency and duration should be reported for more than just 100-year event

The EA needs to identify both frequency and duration of impacts for flooding events more than just the 100-year event. Previous studies have shown impacts in Grand Forks not only in crest elevations but also in duration. These impacts include structural, historic and economic consequences. For example,

the Sorlie Bridge in Grand Forks is affected at approximately a 50 year event and the Kennedy Bridge (Hwy 2) is affected at somewhat less than the 100 year event. Both of these bridges are historically significant but in addition to the historical nature, when these bridges need to be closed, there are significant impacts to the local and regional economies and to the tax base.

Response: Elevation and discharge hydrographs have been created for various gauging locations along the Red and Wild Rice Rivers to better describe the flood patterns for existing and with-project conditions. Hydrographs for the 10-percent chance (10-year) event, 2-percent chance (50-year) event, 1-percent chance (100-year) event, and 0.2-percent chance (500-year) event have been added to Appendix D of the EA. For the 2-percent chance event at the Grand Forks gage, the duration of the with-project hydrograph is extended approximately five hours near the upper end of the hydrograph.

B-13: Hydrologic & hydraulic data needs to be included

The EA needs to include detailed hydrologic and hydraulic data calculations so a detailed evaluation of the results is possible.

Response: The hydrology used in the modeling effort is included in the FEIS and the unsteady HEC-RAS models used for the EA have been provided to the City of Grand Forks' consultant and will be posted to the FM Diversion website: www.FMDiversion.com. The information necessary to perform a detailed evaluation of the results has been provided.

B-14: Impacts from project operation

The hydraulic modeling, as presented, assumes perfect operation, but in actual practice this rarely happens. An analysis needs to be performed on the potential downstream impacts if project operation does not match the planned operational assumptions.

Response: Current modeling assumes what is believed to be attainable, not perfect, operation that is based on actual gage data, not forecasts. Additional modeling and analysis will be completed based on design updates and the best available information to ensure that project impacts are minimized to the extent practicable.

B-15: Modeling of floodplain geometry

Identify how the unsteady HEC-RAS model handles roadway fills in the floodplain that may impact floodplain filling, draining and timing.

Response: The unsteady HEC-RAS model contains a great deal of geometry information including channel and floodplain cross-section data, bridges, culverts, and roads. Roads are modeled as linear features (storage area connections and lateral structures in HEC-RAS). With the detailed geometric data, unsteady HEC-RAS is able to calculate how main stem and tributary hydrographs move down the rivers and occupy the storage available in the floodplain. Continuity, momentum, orifice, and weir equations are used by HEC-RAS to handle the different hydraulic conditions that occur. Specifically for

roads, unsubmerged and submerged weir equations are used to determine the proper amount and direction of flow going over a roadway at any given time.

B-16: Red Lake River timing

How was the timing of the input hydrographs developed and were the hydrographs at Fargo timed so that the Red River peaks and Grand Forks coincide with peaks from the Red Lake River? A sensitivity analysis needs to be performed considering both coincidental timing and off-peak timing.

Response: The timing of the input hydrographs for the synthetic flood events (10-percent chance (10-year) event, 2-percent chance (50-year) event, 1-percent chance (100-year) event, and 0.2-percent chance (500-year) event) is based on the 2006 historic flood for the Red River and gauged tributaries. A sensitivity analysis on tributary and local inflows was completed during the feasibility study. In addition to the tributary sensitivity analyses presented in the FEIS, the timing of the Red Lake River hydrographs was varied to determine the effect on downstream stage impacts. The Red Lake River coincident hydrograph for the 1-percent chance event on the Red River of the North was introduced one- and two-days earlier and one- and two-days later than the baseline for both existing and with-project conditions. The results for these five scenarios are nearly identical. The results of this analysis have been added to Appendix D of the EA.

B-17: IEPR

It is unclear if an Independent External Peer Review (IEPR) was completed. Due to the complexity of the model and the need to determine basin impacts, it is critical that the hydraulics, hydrology and proposed operational plan undergo a peer review prior to making a determination of Finding of No Significant Impact.

Response: IEPR was completed during the feasibility phase and modifications and improvements made to the model to date have been within the scope of the IEPR completed. District Quality Control (DQC) and Agency Technical Reviews (ATR) were also completed during feasibility and have been ongoing during the development and revisions to the modeling and reports. It is anticipated that future DQC and ATR reviews will be warranted when significant revisions to models and documents are completed. Future IEPRs will be done if changes in the proposed design would have a significant impact on life safety. A peer review was performed for the existing conditions unsteady model, and is summarized in Appendix B of the Consultant's Report (Attachment 5) in the FEIS. Also, the Minnesota DNR has reviewed the hydraulic models as part of its EIS efforts.

B-18: Explanation of hydrographs

The hydrographs provided (pages D-5 and D-6) indicate decreased downstream peak flows with both the weir and gate alternatives. However, the decreases in peak flow are greatest at Georgetown and fade as one continues downstream. The new option increases flow through Fargo-Moorhead, maintains a full diversion capacity and yet shows no negative downstream impacts (at crest conditions). These issues need further explanation and discussion.

Response: The impact hydrographs found in Attachment 5 (the Consultant's report), Appendix C of the FEIS, have been updated for the EA at the same locations along the Red River and Wild Rice River. These hydrographs have been added to Appendix D of the EA. As stated in Appendix D of the EA, gates at the diversion inlet results in with-project hydrographs that better match existing-condition hydrographs. This allows the project to function as described in the EA.

B-19: Project operation

The EA discussed how the gate operation is intended to capture the critical timing of allowing the Maple River crest to precede the Red River crest. However, the operational discussions only refer to water surface elevation criteria. Sensitivity testing of not capturing the critical timing on the Maple River needs to be included to determine potential impacts of imperfect operation or information.

Response: Current modeling assumes what is believed to be attainable, not perfect, operation that is based on actual gage data, not forecasts. Additional modeling and analysis will be completed based on design updates and the best available information to ensure that project impacts are minimized to the extent practicable.

*B-20: River forecasting

A discussion of how the river forecast center will incorporate the new river conditions and operations into their downstream modeling forecasts needs to be included in the EA.

Response: The Corps is aware that the Project will affect flow forecasts and has been coordinating with, and will continue to coordinate with, the National Weather Service to ensure forecasts are considered in the development and final operation of the Project. There is no additional information available to share at this time.

*B-21: Data practices by other agencies

How will FEMA and other regulatory agencies treat the data as presented? A discussion as to how this may or may not be utilized in the future needs to be discussed within the EA. Inclusion of this data as "best available information" or outright regulatory implementation can create consequences that cannot be determined at this time.

Response: Per ongoing coordination with FEMA, the downstream extent of the CLOMR submittal would be the outlet of the diversion channel to the Red River and, therefore, will not affect any communities downstream of the outlet, including Grand Forks.

*B-22: Effects of ice

Have the effects of ice been taken into consideration relative to timing advancement of flows downstream?

Response: The hydrographs that have been added to Appendix D of the EA display the existing and with-project hydrographs. The hydrographs show that the changes in the timing and advancement of flows

with-project are minimal and the ice effects will not be any better or worse downstream of the Project than what is currently experienced.

B-23: Storage volume

The EA makes general statements regarding changes of storage volume. More detail needs to be provided relative to storage and also how the contributing rivers and ditches will behave and/or be restricted to pre-project conditions. This should be done for the 10, 50, 100, and 500 year events.

Response: The hydrographs that have been added to Appendix D of the EA display the existing and with-project hydrographs. The hydrographs show that the changes in the timing and advancement of flows with-project are minimal and will therefore have little impact on existing rivers and ditches downstream of the diversion channel.

*B-24: Flash flooding

What is the potential for internal flash flooding for the Oxbow/Hickson/Bakke ring levee?

Response: The Oxbow/Hickson/Bakke ring levee will be designed to meet Corps standards for interior drainage.

*B-25: Benefits from sub-watersheds not captured

The Corps' analysis of benefits of distributed storage does not include the benefits to sub-watersheds where the distributed storage is located.

Response: The project purpose is to reduce flood risk to the Fargo-Moorhead metro area; benefits to sub-watersheds outside of the study area were not calculated.

B-26: Farmed wetland

Please identify where the "farmed wetland along one of the rivers" is and the cost.

Response: The exact location and costs of converting farmed wetlands into floodplain forest have not been identified and will be identified during detailed design and construction.

B-27: Ring levee impacts in Minnesota

Have studies been done to show the impact of the Oxbow/Hickson/Bakke ring levee on water on the Minnesota side of the Red River? What about the impact of raising Highway 81 and thus pushing water onto Minnesota?

Response: With the Project in place, the ring levee and road raise do not increase the project impact. Studies of the impact of the ring levee and road raise if the rest of the Project is not constructed have not been conducted.

B-28: Extension of “Red Box”

The “Red Box” needs to be extended east past the tie back embankment, as the impacts extend past the embankment.

Response: The staging area was defined to encompass areas with one foot or more of increased flood stage during a 1-percent chance event with the Project in operation. Prior to real estate acquisition, the staging area will be re-drawn to reflect the final anticipated flood stages throughout the project area.

B-29: Impacts of Oxbow/Hickson/Bakke ring levee on water table

What impacts to the water table due to prolonged periods of inundation can be expected for land inside the ring levee?

Response: The construction of the ring levee around Oxbow, Hickson, and Bakke is not expected to have a measurable effect on the regional ground water table. The ground water table may increase adjacent to the dryside of the ring levee but seepage should be relatively small due to the impervious nature of the levee and foundation materials. The Oxbow/Hickson/Bakke ring levee situation is similar to other flood risk management projects that have been constructed within the Red River Valley.

With the construction of the ring levee, the water table will increase during a flood, which is taken into account when designing levee systems. The magnitude of the change depends on the duration of the flood event and the distance from the ring levee. But due to the relatively impervious nature of the soils in the Red River Valley, the quantity of seepage related to the rising flood water should be relatively small. If present, sand seams and pervious materials can increase the likelihood of seepage. The risk of this being an issue is reduced based on investigations during detailed design, construction of an inspection trench, and construction measures to cut off possible seepage; this is standard design and construction practice for Corps projects. Given that the current conceptual alignment for the ring levee is setback from the Red River and does not cross the known ancient oxbow, Oxbow, Hickson, and Bakke should have conditions similar to the many other community levees and floodwalls adjacent to the river, and no issues are anticipated. A permanent project would have the benefits of an engineered solution that a temporary or emergency levee does not.

B-30: Flood elevations not consistently represented

The use of the “wet” 46.7 feet has been changed to the FEMA 43.3 feet and the impact to the expected annual damages is not discussed. This is critical as the “wet” flood level increased the damages and this should require a revision to the Record of Decision and benefit cost ratio. The FEIS, documents from the Minnesota Department of Natural Resources, FEMA documents, and public meeting presentations present different flood elevations.

Response: The fact that Phase 3 modeling expected stages are higher than Phase 4 expected stages was known and discussed in the FEIS. For more details, refer to Table B-1 in Appendix B and Section 3.10 in Appendix C of the FEIS. The EA was prepared to discuss the impacts of modifications made to the plan after the FEIS was completed. The economic analysis was not revisited for the EA, because no changes

that would significantly affect the project's economics were made. The modifications discussed in the EA reduced the project's overall cost and reduced the number of residential structures impacted. These changes do not adversely affect the economic benefits of the project.

The stage information presented in MNDNR's documents is generally consistent with the Phase 4 values presented in the FEIS. The Corps' hydrologic analyses include more recent flood events and are more current than the data FEMA is currently using for the National Flood Insurance Program.

B-31: Elevations not consistent

The staging and flooded areas are not consistent with elevations.

Response:

The staging area shown is based on an elevation of 922.2 just upstream of the tieback embankment for the 1-percent and 0.2-percent chance events. There is the question of whether the low area east of the ridge at the eastern edge of the storage area should be in or out of the staging area. If drainage issues cannot be resolved for this area, it may be added to the staging area. The area in question is currently being studied in greater detail in order to fully address other comments made regarding this area.

***B-32: Future development in the staging area**

Project takes away the ability to build in the staging area that is currently above the 100 and 500 year flood events.

Response: The staging area is required to operate the Project. Impacts within the staging area would be mitigated by fee acquisitions and flowage easements, which would compensate property owners for the loss of future development within the staging area.

B-33: Staging area reduction needed

It is stated that the staging area was reduced to 150,000 from 200,000 but the staging area was not reduced to show the change.

Response: Due to previous modeling limitations upstream of the staging area, the FEIS rounded the additional storage required to mitigate downstream stage impacts from an actual value of about 175,000 acre-feet to 200,000 acre-feet (the Corps did not want to understate the additional storage upstream of the staging area). Improvements to the model upstream of the staging area since the FEIS have confirmed the 175,000 acre-feet value for the plan proposed in the FEIS. In the FEIS, the 1-percent chance event pool elevation was 923.0 and now the 1-percent chance event pool elevation is 922.2. The area affected by the inundation is approximately 33,000 acres. 33,000 acres multiplied by 0.8 feet (923.0 - 922.2) is 26,400 acre-feet, which essentially accounts for the change from 175,000 acre-feet to 150,000 acre-feet.

4 Comment Category C: Design and Operation

C-1: Operation of diversion inlet structure

Several comments asked about who would control and manage the operation of the diversion inlet structure and other features. The EA needs to identify who will operate the Project.

Response: Per FEIS section 3.13.5, the non-Federal sponsors would be responsible for all operations, maintenance, repair, rehabilitation, and replacement of project features. As stated in FEIS section 3.8.3.1, the operations and maintenance of these structures and all project features would be dictated in the Operation and Maintenance Manual that would be provided to the non-Federal sponsors upon completion of the Project. The non-Federal sponsors would be required to operate the diversion channel inlet structure and all other features in accordance to the Operation and Maintenance Manual which would be developed by the Corps prior to project operation.

*C-2: Traffic and road studies

What roadway or traffic studies have been done? If any have been done they should be included in the report.

Response: Roadway and traffic impacts were addressed in the FEIS and will continue to be studied and evaluated during the design phase.

*C-3: Drainage needs to be addressed

Drains or ditches which will be channeled to the diversion channel need to be addressed and included in the EA. The EA does not indicate how drainage from multiple sources will be channeled into the diversion channel.

Response: There will be drainage ditches running along the exterior excavated material berm toe on both sides of the diversion channel. The left-bank (looking downstream) ditch will direct flow to the diversion inlets (e.g. Drain 30, Rush River, Reach 4 inlet, etc.). The right-bank ditch will direct flow into existing drainage features that will direct flow away from the diversion channel. Drainage features have been and will continue to be incorporated into the detailed design of the Project.

*C-4: Road realignment

Cass County Highway 16 north of the existing bridge over Interstate 29 should be moved one mile north; this would straighten the road and ensure traffic could continue to use it during project operation.

Response: Comment noted; suggestion will be considered during the design of this part of the alignment.

C-5: Height of in-town levees

Several comments were related to the proposed height of the in-town levees, specifically asking why the levees could not be built higher to avoid having to implement any emergency measures or to eliminate the need for a diversion.

Response: The rationale for selecting a levee height and target flow through town is explained in the EA in Section 1.1 of Appendix B (In-Town Levees). As stated in Section 5.5 of the EA, the non-Federal sponsors have indicated that they plan to build some levee reaches above 35 feet in order to address higher flood stages. In-town floodwalls will be built higher, as emergency measures are difficult, if not impossible, on floodwalls. Levees will allow emergency measures. It is not cost effective to build an entire permanent line of protection within the benefitted area that is higher than 35 feet, although such a levee system would be needed to fight floods larger than a 1-percent chance event. Without the diversion channel, it would not be cost effective to build levees high enough to achieve FEMA certification for the 1-percent chance event, because of the cost of tying into distant high ground or constructing a complete ring levee.

C-6: Connecting channel alignment

The connecting channel should be moved slightly south to avoid impacting several homes and farmsteads.

Response: Comment noted; this minor alignment shift will be considered during the detailed design.

*C-7: Status of Alignment

A commenter asked about how final the alignment is.

Response: The diversion channel alignment is presented in the EA; minor shifts may be made during final design of each portion of the alignment. If modifications are proposed in the future that would change the environmental impacts of the project, additional NEPA documentation may be required.

C-8: Alignment Shifts

A commenter stated that with the proposed alignment shifts the Project now impacts his property, and is upset with the proposed modifications.

Response: It is recognized that the diversion channel and associated features will negatively impact some people. The alignment shifts were determined based on technical factors, costs, and impacts to residents. Any alignment will have positive benefits for some and negative impacts for others.

*C-9: Location of diversion inlet structure

Why is the diversion inlet structure not located on the Red River?

Response: There would be a smaller channel, referred to as the “connecting channel” between the Red River and the Wild Rice River and between the Wild Rice River and the diversion inlet structure so that water first makes it to the diversion inlet structure in this channel. The connecting channel is part of the

diversion system, but is given a different name since it would be much smaller and because the larger main diversion channel starts at the location of pool control, which is where the diversion inlet structure is located.

C-10: Road impacts in Minnesota

What roads in Minnesota would be impacted by flood waters in the staging area?

Response: Highway 75 in Minnesota and a short section of County Road 2 between Comstock and Highway 75 would be raised within the staging area. All other roads in Minnesota will remain as they currently are today; roads that are shown as being in the staging area may be flooded during certain flood events.

C-11: Staging area operation

How will the lack of a full diversion channel affect the duration of water being stored in the staging area?

Response: In accordance with Corps planning guidance, the impacts of the Project have been calculated based on a completed project. Control structure operation prior to having a completed project could have different impacts, would require an analysis to evaluate the potential change in effects, and may require additional NEPA documentation.

C-12: Drainage in the staging area

The southern embankment goes through a coulee east of the Red Box, which will create a severe restriction of flow. Local drainage is also an issue with the proposed plan. How will drainage be affected within the staging area?

Response: The Corps recognizes that there are drainage issues that must be addressed for the area described to be within the staging area. This area will be studied in order to address comments made regarding this area.

C-13: Southern embankment height

In some project documents, the height of the southern embankment has been stated as 927 and 930. The Oxbow Ring Dike has been listed as 926. This seems to indicate that the Oxbow Ring Dike is 4 feet too low. Please clarify.

Response: Preliminary elevations have been stated in some project documents, but there is still design work to be done to determine the elevation of the southern embankment and the Oxbow/Bakke/Hickson Ring Levee. At this time, the top of the southern embankment is anticipated to be between 927.5 and 930.1. A detailed study of project operations during extreme events will be performed to determine the elevation. The southern embankment will be designed using dam safety criteria, which will result in a higher elevation than if it was designed using levee safety requirements. The height of the Oxbow/Bakke/Hickson ring levee has yet to be determined but will likely be no less

than 4 ft. above the 1-percent and 0.2-percent water surface elevations. The ring levee elevation could be lower in elevation than the southern embankment, but the overflow embankment along the west side of the staging area will be lower than both the southern embankment and the Oxbow/Bakke/Hickson ring levee (it is currently at elevation 923.0).

C-14: Diversion inlet flows

What will the flow rate be at the control structure once the river is re-routed compared to existing conditions?

Response: Figures 13-16 of the EA show the flow at the USGS Fargo gage under existing and with-project conditions for the 10-percent chance, 2-percent chance, 1-percent chance, and 0.5-percent chance events. The combined flow through the Red River and Wild Rice River structures would be essentially the same as the flow at the USGS gage. The exact flow through each structure will depend on the exact contributions from the two rivers. Figures 13-16 of the EA also show the flow at the diversion inlet control structure for the 10-percent chance, 2-percent chance, 1-percent chance, and 0.5-percent chance events.

C-15: Western alignment

A commenter requested the western alignment be moved west to save the taxpayers' money.

Response: Cost is not the sole factor considered when determining project alignments. The proposed alignment presented in the EA would resolve several technical issues from what was presented in the FEIS. There was no technical reason to go further west than what was presented in the EA: there was no needed benefit for the WAPA substation, and the proposed modification removes the least amount of additional land from the floodplain while still addressing the technical issues.

*C-16: Oxbow/Hickson/Bakke levee setbacks

What will the setbacks be for the Oxbow/Hickson/Bakke ring levee?

Response: The setbacks will follow Corps setback policy for levees and will be determined during detailed design.

*C-17: Location of control structure

Why is the control structure entirely on the Minnesota side of the Red River?

Response: The Red River control structure is located east of the existing Red River channel so that it can be constructed in dry conditions. After the structure is built, the Red River channel will be re-routed to pass through the structure, and the existing channel will be blocked by an embankment. The location along the Red River was selected to minimize the length of existing river that would be affected by the project.

C-18: Ground shifting

What is the possibility of the ground shifting due to the ring levee?

Response: The ring levee will increase the load on the soils beneath it. This will cause the clay materials beneath to consolidate (settle) over time and is accounted for in design. This is typical of levees within the Red River valley.

*C-19: County Road 32

County Road 32 needs to be paved because it will see a lot of additional traffic. It is currently gravel.

Response: Comment noted; suggestion will be considered during the design of this part of the alignment.

5 Comment Category D: Project Implementation and Schedule

*D-1: Property acquisition for those not directly on the diversion channel alignment

Property owners would like to know if there is a process in place for requesting a buyout when their property is situated outside of the project boundary and their lifestyle will be negatively impacted during construction and after construction of the Project. Similar questions were raised by property owners who would be within the Oxbow/Hickson/Bakke ring levee and would prefer to be acquired.

Response: According to federal law, only property interests required for construction, operation, or mitigation of the Project are required to be purchased.

*D-2: Perceived decrease in land value/requesting acquisition

There were several comments regarding residents not being able to sell their homes or relocate due to decreased land value. Residents would like to know a timeframe for compensation, how they can be compensated or have their property acquired, and an adequate/fair compensation for fee acquisitions or easements. Some would like to know if they can have their property acquired immediately. One comment stated that they heard the process would be either take what the Corps offers, negotiate with the Diversion Authority, or go to court with a Fargo judge.

Response: The process of acquiring property for a Federal project is highly regulated in Federal law. The Fifth Amendment of the Constitution states that private property shall not be taken for public use without just compensation. To address what constitutes just compensation, Congress passed the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 ("Uniform Act"). The non-Federal sponsors will be required to follow the Uniform Act in acquiring lands for the Project. In addition, the state laws of Minnesota and North Dakota regulate land acquisition in their respective states. The non-Federal sponsors are responsible for real estate acquisition. The Corps will work with the non-Federal sponsors to ensure the correct process and procedures are adhered to throughout the process.

Part of the process will be an appraisal, which determines the fair market value of the property. Fair market value is an estimate of the market value of a property based upon what a knowledgeable, willing, and unpressured buyer would pay. The appraisal will attempt to take all objective property features into account when determining fair market value. The fair market value is determined without consideration for the effect the Project has had on the value of the land. Each parcel is unique and distinctive and must have a determination made as to the most appropriate way to mitigate Project effects and compensate owners for damages. Easements are handled in a similar manner as fee acquisitions.

The non-Federal sponsors will establish timetables for real estate acquisitions once the Project has been authorized and funded based upon the needs of the Project and available resources. The non-Federal

sponsors have approved a Medical Hardship policy, which allows properties to be acquired early, if the owner(s) meets specific medical conditions.

***D-3: Crop insurance**

The issue of crop insurance has not been resolved.

Response: The Federal process compensates land owners for potential losses when the property interest is acquired. The Risk Management Agency, a subsidiary of the United States Department of Agriculture, is the agency responsible for crop insurance rules and regulations. Producers in the affected area would be able to obtain crop insurance. However, they may not be compensated for flooding if it is determined that the inability to plant in the spring is due primarily to project operation or if induced flooding in the summer is caused by the Project. The effects of induced flooding from the Project would be compensated for by way of a flowage easement or other property interest obtained by the non-Federal sponsors. The Corps and the non-Federal sponsors are in contact with the Risk Management Agency to discuss effects of the Project and possible mitigation options.

D-4: Horace public meeting

One commenter wanted to see the Horace public meeting included in the EA.

Response: The meeting in Horace, North Dakota was not a public meeting led by the Corps. The EA has been revised to state that additional meetings were held by the non-Federal sponsors.

***D-5: Project construction**

What is the timeline for the project construction and what are the methods of delivery for the construction contracts?

Response: The Corps and non-Federal sponsors will contract with construction contractors through their contracting rules and procedures. Construction using Federal funds will not start until Congress authorizes and funds construction of the Project and the non-Federal sponsors and Corps sign a Project Partnership Agreement. Construction using non-Federal funds may begin on portions of the Project prior to Congressional authorization and federal funding if those portions are identified in an approved Memorandum of Understanding between the Corps and the non-Federal sponsors. The earliest construction would start is 2014.

D-6: Comment period extension

One comment suggested an extension to the 30-day comment period.

Response: Multiple public meetings and Diversion Authority meetings were held prior to the release of the EA to present information on the proposed modifications, and the information was made available on the project website at www.FMDiversion.com. The end result has been that the majority of the information presented in the EA has been available to the public for substantially longer than the 30 day

review period. Given the above, and that no reason was given for why an extension was suggested, an extension of the comment period was not warranted.

***D-7: Project funding**

There were several questions regarding where funds for implementing and constructing the Project come from and how the Corps would proceed with the Project if Federal funds are not appropriated.

Response: If the Project is authorized by Congress, costs of the Project will be shared between the Federal government and the non-Federal sponsors. Federal funds would be appropriated through the annual federal appropriations process. The non-Federal sponsors will be responsible for generating the funds necessary to pay the non-Federal share of project costs. If no funds are available (Federal or non-Federal), work on the Project will cease. If Federal funds are not appropriated but non-Federal funds are available, the non-Federal sponsors and the Corps may enter into agreements that would allow portions of the project to continue.

***D-8: Acquisition of properties along the Red River**

Why are properties along the Red River being acquired and landowners being paid a large sum for their flood prone properties?

Response: The cities of Fargo and Moorhead have purchased numerous homes in flood prone areas along the Red River. These acquisitions are not a part of the federal project.

D-9: Life-risk assessment for Oxbow/ Hickson/Bakke

Several comments asked what life-risk assessment or other analysis have been completed for the proposed Oxbow/Hickson/Bakke ring levee.

Response: No loss of life analysis has been completed for the Oxbow/Hickson/Bakke ring levee. The levee will be designed to meet Corps standards for levees, with a top elevation in excess of the 0.2-percent chance flood stage induced by the Project. Residual risk inside the ring levee would be lower than the risk under future without project conditions, considering the anticipated frequency of emergency flood fighting actions and relatively low reliability of emergency measures.

D-10: General questions about the Oxbow/Hickson/Bakke ring levee

Numerous questions related to the proposed ring levee were raised including: who is responsible for loss of property or loss of life from a levee failure, how will evacuation contingencies be addressed, how will septic systems be impacted, will residents be required to carry FEMA National Flood Insurance, and will residents currently outside of the 100-year floodplain now be considered "high-risk" by FEMA?

Response: The Oxbow/Hickson/Bakke ring levee will be designed and constructed to meet Corps standards for levees, with a top elevation in excess of the 0.2-percent chance event flood stage induced by the Project. Ring levee failure or overtopping is highly unlikely. The top of the ring levee will be higher than the staging area overflow embankment. Operation of the Project is not expected to affect

existing septic systems within the ring levee. The ring levee will have an emergency evacuation and contingency plan; this plan has not been developed, but will be developed during detailed design of the ring levee. The Corps cannot speak for FEMA, but the coordination efforts between the Corps and FEMA are ongoing. Current FEMA policy would not require residents within the proposed levee to carry National Flood Insurance, although this policy could change in the future.

***D-11: Alternate project purpose and eminent domain**

Several comments stated that the purpose of the Project was economic development, and some questioned whether eminent domain could therefore be used under North Dakota Law.

Response: The purpose of the Project is to reduce flood risk and flood damages in the Fargo-Moorhead metropolitan area, not economic development. The Fargo-Moorhead metropolitan area is expected to continue to grow with or without the Project; areas within the benefitted area would likely be developed with or without the Project.

***D-12: Relocation of farm headquarters**

The issue of farm headquarters relocations for those located within the staging area has not been resolved.

Response: The Federally Recommended Plan presented in the FEIS calls for fee acquisition and removal of homesteads within the staging area. Limited exceptions may be considered in the future where access and site elevation is suitable for other arrangements. The mitigation for those living and working in the staging area is not required to be addressed until the staging area is required for project operation. The mitigation for farm headquarters would be addressed at that time and will follow the Federal land acquisition process.

D-13: Further studies for Oxbow/Hickson/Bakke ring levee

What impacts are expected for the communities if there is prolonged inundation, how will property owners be compensated for property lost due to prolonged inundation, and what guarantee can the Corps give that there will be no negative effects from prolonged inundation?

Response: The Oxbow/Hickson/Bakke ring levee will be designed to meet Corps standards for such systems. Corps levees in Wahpeton/Breckenridge, Fargo, West Fargo, Argusville, Grand Forks, East Grand Forks, Oslo, Pembina, and Devils Lake have withstood long periods of inundation with no adverse impacts inside the levee systems. The expectation is that the Oxbow/Hickson/Bakke levee would function as designed.

***D-14: Homeowners insurance**

Does homeowners insurance cover losses from ground water issues?

Response: Please consult your homeowner's insurance policy on losses due to ground water.

***D-15: Improvements to property**

One commenter stated that they cannot sell or make improvements to their property because they may be impacted by the diversion.

Response: The Corps and the non-Federal sponsors cannot advise on whether homeowners should make improvements to their property. The Project has not yet been authorized or funded by Congress, so project impacts or acquisitions may not occur. For properties impacted and acquired by the Project, improvements made to homes and properties will be taken into consideration when the property is appraised at its fair market value. The fair market value is determined without consideration of the effect the Project has had or will have on the value of the property.

***D-16: Benefits and costs**

Since the Project will be constructed in steps the benefits and costs should be done for each phase.

Response: In accordance with Corps planning and guidance, the benefits and costs for the Project are calculated based on the entire project and will not be separated for each separable element or phase of project construction.

D-17: Ponding area in Oxbow/Hickson/Bakke ring levee

What will the depth be of the ponding area inside the ring levee and will it be safe for children?

Response: The ponding areas will be designed along with the other interior drainage features during the design phase. Normally, ponding areas are designed to remain dry except after rain or snowmelt events. Children should always be supervised around water to ensure their safety.

***D-18: Impacts to Richland and Wilkin Counties**

Impacts to Richland and Wilkin Counties cannot be adequately addressed without an operating plan. What will be done if the models are not accurate?

Response: The impacts to Richland and Wilkin Counties have been adequately studied and documented. Refinements to the models are ongoing and any major changes based on the models will be documented and mitigated as necessary.

***D-19: Pest control**

Will there be pest control issues with the ring levee?

Response: The operation and maintenance plan for the levee system will include measures to address rodents and other burrowing animals that may degrade the levee structure. The levee is not expected to change conditions related to any other types of pests.

***D-20: Levee breach**

Is there a possibility that the ring levee would breach?

Response: The Oxbow/Hickson/Bakke ring levee will be designed and constructed to Corps standards. With any levee system there is the possibility of failure. The ring levee will be similar to other ring levees in the Red River valley.

D-21: Drainage in the ring levee

How will interior drainage be impacted, will pumps be required, and will there be redundant pumps and generator systems?

Response: Interior drainage is discussed in Appendix C, section 2.4, Internal Drainage, of the EA. A storm water pump station would be required. As with other storm water pump stations in the area and with industry standards, redundant pumps and power would be provided.

D-22: Tax base of Oxbow, Hickson, and Bakke

The statement of “maintain the tax base for the communities” is conjecture and not connected to fact.

Response: As presented in the FEIS, the alternative to a ring levee for the Oxbow, Hickson, and Bakke communities would be a complete fee acquisition, which would eliminate the tax base. The ring levee will allow residents to continue to live in the area and pay taxes; therefore, the tax base is maintained.

D-23: Oxbow/Hickson/Bakke ring levee costs

Who will pay for the construction and maintenance of the ring levee including pump and lift stations and generators? Will the local residents be assessed for any portion of the ring levee? What are the other ancillary costs for the ring levee?

Response: The construction of the ring levee would be part of the Federal project, which is subject to a cost sharing between the Federal government and the Local Sponsor. The costs for the operation and maintenance of the ring levee would be the responsibility of the Local Sponsors. For the construction of the ring levee, the Local Sponsors intend to use a combination funding provided by sales tax revenues of the City of Fargo and Cass County, and by appropriated funds of the State of North Dakota. It is expected that sales tax receipts of the City of Fargo and Cass County will be the principal source of funds to repay the bonds sold to finance the Local Sponsor's share of the larger Diversion Project. The financing structure for the loans or bonds will require the establishment of a special assessment district as a back-up for repayment and, therefore, it is likely that a special improvement district will be established. The boundaries of the district would include the lands that receive a benefit from the Diversion Project, including Oxbow, Hickson, and Bakke. In the event that properties in Oxbow, Hickson, or Bakke are assessed for construction of the Diversion Project, the Local Sponsors have agreed to pay those construction assessments. For the operation and maintenance of the ring levee, the properties within the ring levee (property owners in Oxbow, Hickson, and Bakke) will be assessed for the O&M and associated administrative costs, in the same manner as other lands protected by the Diversion Project. It is too early in the design phase to accurately determine ancillary costs for the ring levee.

*D-24: Increased flood risk

Commenter was told her flood risk outside of the diversion channel would be increased.

Response: It is the intent of the Project to not increase flood risk up through the 1-percent chance event to those outside of the Project area and to provide improved flood risk to those in the benefited area.

*D-25: Pleasant Township tax base

The tax base for Pleasant Township will be affected; the Diversion Authority is responsible for addressing those impacts.

Response: The potential loss of tax revenue is not compensable as part of the cost-shared Federal project. The Corps encourages the township to work with the non-Federal sponsors to address items that cannot be addressed by the Federal project.

6 Comment Category E: Other

E-1: Dislike for the Project

Several comments stated their dislike for the overall project.

Response: It is recognized that the Project will negatively impact some people. Any project alternative will have positive benefits for some and negative impacts for others.

E-2: Public meeting format

Several comments stated that they did not like the format of the most recent public meetings. One commenter stated that the meetings should have been recorded.

Response: The Corps and non-Federal sponsors continually evaluate and modify the public process to meet the needs of the public and communicate information to interested parties. The last set of public meetings was intended to provide updated information on the proposed project modifications. Since the meetings occurred during the public comment period, it was decided that comments should be captured in written form; therefore, no verbal public comments were taken during the public meeting. The public meetings were video recorded and can be viewed at: www.FMDiversion.com.

E-3: Agree with Project

Several comments expressed agreement with the proposed project modifications and were hopeful the Project will be authorized and implemented quickly.

Response: Comments noted.

*E-4: Building codes

A commenter stated that restrictive building codes should be in place for flood prone lands throughout the entire basin.

Response: Building codes are the responsibility of local entities and not part of the federal project.

*E-5: Levees impact on property values

What studies have been done to show the impact of levees on property values?

Response: No studies specific to property values and the Project have been completed.

