Minnesota Department of Natural Resources

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RE: Minnesota Department of Natural Resources (DNR) Comments
Fargo Moorhead Final Feasibility Report and Environmental Impact Statement (FEIS)

Dear Mr. Snyder,

The State of Minnesota remains committed to flood protection in the Red River valley and appreciates the opportunity to review the FEIS. Based on our review of the FEIS, it's still apparent that additional work is needed to demonstrate that the selected alternative is:

- ecologically sustainable,
- the least impact solution,
- one in which adverse effects can and will be mitigated, and
- consistent with other standards, ordinances, and resource plans of federal, local and regional governments.

The locally preferred plan includes a water control structure that is classified as a high hazard dam, which requires preparation of Minnesota State EIS. As part of State EIS scoping, additional assessment and review will be necessary to demonstrate that the above mentioned criteria are fulfilled. This letter provides insight on the types of issues that must be addressed as part of state environmental review and permitting.

Portions of past DNR correspondence remain relevant as key concerns are not addressed. DNR comment topics remain consistent with past correspondence. In the interest of brevity, DNR comments on the FEIS will reference past comments when appropriate. Referenced comments should be considered part of DNR's FEIS comments.

Attachments:

1. DNR DEIS comments - August 6th, 2010
2. DNR SDEIS Scoping Comments – January 24, 2011
3. DNR SDEIS Comments – June 16, 2011

For each topic, general, and in some cases, specific comments (which reference specific areas in the FEIS) are provided. The DNR offers the following comments:

Scope of Alternatives

General Comments:
The alternative analysis and screening conducted as part of the federal EIS has been a significant source of concern and has received many comments from the public and agencies (DNR included). Review of Appendix O has generated several questions around the cost benefit analysis and alternative screening. As part of State EIS scoping the MDNR needs to verify and document the information that was used in the various phases of the federal EIS. In order to complete the MDNR's administrative record for the State EIS, we will need an independent review and documentation of the key decision steps and the information that was used to make the decisions. This detailed review and documentation will either confirm selection of alternatives in the federal FEIS or identify other alternatives that should be evaluated as part of the State EIS.

Specific Comments:

Magnitude of Flood Risk Reduction
Appendix U response to comments addresses the level of flood risk reduction in response to comment A-15. This response indicates that the level of flood risk reduction was a goal of a 36 feet stage at the Fargo gage for a 0.2% chance event (500 year flood) that had been identified by the Metro Flood Study Workgroup (MFSWG) and that minutes from the MFSWG are in Appendix Q.

Minnesota Rules part 4410.2300 subpart G provides the content requirements for Minnesota State EISs as it relates to alternatives. One of the alternatives that needs to be evaluated is a modified scale or magnitude. The magnitude of flood risk reduction is appropriate for alternative analysis. The specific level of flood risk reduction that is selected as meeting the project purpose is critical to alternative screening and alternative analysis. After reviewing the MFSWG minutes it is still unclear how the 500 year flood protection was determined to meet the purpose of the project. There are statements that indicate a desire for more than 100 year flood protection and that 500 year flood protection would protect a much greater area. There is also a mention of county planning for flood elevation of 36 feet. Presumably there are criteria or rationale that was used by the MFSWG to set the goal of protecting the metro area at a 36 foot stage for 0.2% chance flood events. However, this information was unattainable from the meeting minutes as was suggested by the response to comment A-15.

Additionally, it is unclear how the MFSWG determined the locally preferred plan (LPP) that does not meet the MFSWG goal was still an acceptable level of flood protection. The discussion indicates flood fighting techniques could be used during those floods that have a stage over 36 feet at the Fargo gage. It appears that the flood elevation when at a stage of 36 feet is a critical flood elevation for protection efforts. Documentation of the information that led to this decision is needed as part of the State EIS process.

As was indicated in our comments on the SDEIS, the MDNR is concerned that viable alternatives for flood protection were screened out because the magnitude of the flood risk reduction goal was

too large. As part the Minnesota State EIS Scoping the MDNR will need a record of explicit factors that were considered by the MFSWG and how those factors lead to the 500 year flood protection goal.

Control Structures

Response to comment A-22 indicates that incremental measures such as small levees and non-structural measures do not have a synergistic effect with the proposed diversion; as such, the diversion without control structures is not a feasible alternative even with the incremental measures in place. The response indicates a diversion without control structures is marginally feasible at best and a diversion without control structures is less efficient regardless of other incremental measures in place.

Phase 1 evaluated diversions without control structures and found that they were very effective at decreasing flood stages but not cost effective. Phase 2 screening #1 found the addition of the control structure drastically improved performance with a modest increase in cost. Both of the cost benefit analyses for these conclusions need verification as part of the State EIS scoping. The control structure has the potential for significant environmental effects so the DNR must assure that there are no other feasible and prudent alternatives.

Passing Additional Flow through Fargo-Moorhead

The FEIS provides brief mention of the possibility of passing additional water through the Fargo-Moorhead area at flows above 9,600 cfs at Fargo. It is unclear why it is a possibility to allow additional water through town as a mitigation measure, yet this alternative wasn't carried forward as a project alternative. It seems that inclusion of such a measure could significantly minimize a variety of impacts and still meet the project purpose. Since MN can only permit a least impact solution, the State EIS scoping and permitting will need to fully explore this alternative. It is unclear how this incremental measure was deemed appropriate as mitigation given the response to comment A-22 that indicated no synergistic effect between levees and diversion channels was found.

Future Development

Response to comment A-22 indicates development within flood prone areas is restricted by city floodplain ordinances based on FEMA maps. The future development in the study area is assumed to be in compliance with local city floodplain ordinances. Development will need to comply with existing floodplain maps and ordinances until a FEMA Letter of Map Revision is approved.

It is unclear how future development in flood prone areas was treated in the federal process. The response assumes compliance with flood protection land use regulations, but yet there is still a problem. How and why are the land use regulations failing (development prior to regulations, greater magnitude floods that are not addressed by regulation, etc.)? There may be an opportunity to look creatively at land use controls that help reduce flood risk if the current regulations leave an unacceptable level of risk.

The use of future development in (previous) flood prone areas as project benefit seems to drive up the cost benefit ratio for projects that protect the largest land base. We need a better understanding of the how the benefits from developing formerly flood prone areas were calculated in the cost benefit analysis.

Alternative Screening Criteria

The Corps identified a broad set of screening criteria that were used as part of alternative screening. We need a clear idea of how these criteria were applied to each alternative. We need to fully understand the application of the criteria used in the federal EIS and develop the criteria we will use as part of alternative screening in the State EIS.

Hydrology

In responding to DNR comments requesting that if used, the wet-dry analysis should be submitted to FEMA for review and acceptance, the Corps responded, "*The Corps has been working closely with FEMA, the State of Minnesota, and the State of North Dakota to ensure that the project as proposed will be provided with a CLOMR. The proposed mitigation should be sufficient to comply with all current regulations. The Corps will continue to coordinate with the agencies as this project progresses.*" It is our understanding that FEMA and the Corps are developing a Memorandum of Understanding regarding the CLOMR. Review of the wet-dry analysis should be included in the MOU.

Floodplain Hydraulics

DNR's comments requested the FEIS describe compatibility with all land use controls and that costs for all mitigation and for development without the CLOMR be included in the economic analysis.

A description of local, state and federal floodplain requirements along with plan compatibility and consistency should be well articulated for a flood damage reduction project. Instead, the main text of the FEIS contains no mention of the CLOMR process, compatibilities with land use regulations and steps needed to address those incompatibilities. Instead, the Appendix U containing responses to comments indicates, *"The Corps has been working closely with FEMA, the State of Minnesota, and the State of North Dakota to ensure that the project as proposed will be provided with a CLOMR. The proposed mitigation should be sufficient to comply with all current regulations. The Corps will continue to coordinate with the agencies as this project progresses."*

Section 3.8.3.4.2 indicates that there is no federal requirement for mitigation. It's our understanding that FEMA does require mitigation to existing buildings and will have mitigation requirements beyond what can be reimbursed by the Corps as determined by the takings analysis. It remains unclear whether all of these costs were included in the cost benefit analysis.

The State EIS will need to fully describe project consistency and compatibility with all applicable land use controls. All mitigation costs and costs for development without the CLOMR should be included in the economic analysis. Specifics about the types of mitigation and who will pay for it will also be required for State permitting.

Geomorphology

DNR's geomorphology comments on the FEIS contained herein focus on the locally preferred plan (LPP). With exception to providing additional sediment data, DNR comments in the FEIS regarding other alternatives remain relevant and are attached.

General Comments:
Overall the FEIS continues to drastically discount the potential for impacts caused by changes in geomorphic processes. Furthermore, DNR's direct observations of major sedimentation along the Red River following large flood events contradict many of the estimates and conclusions in the FEIS. It will be necessary for the State EIS to fully disclose both the likelihood and the significance of these impacts.

Specific Comments:

Upstream Sedimentation

Corps response to comments indicates, "*If the conservative estimate presented in the FEIS (conservative because it is assumed that all incoming sediment from upstream would settle in the flood pool) would be off by one to two orders of magnitude in some localized areas, the sedimentation rates in such areas would be 2-3 inches, which is well within the expected range of sedimentation driven by natural processes during large flood events in a complex riverine system where sediment transport is dominated by very fine material (silts and clays) mobilized in suspension.*" As referenced in our SDEIS comments, DNR has frequently witnessed 2 feet or more of sediment deposition in non-reservoir areas. Furthermore, comparisons to Christine and Hickson are not appropriate. Both of these dams inundate at bankfull and have higher flows resulting in reservoir stages, slopes, and shear stress values that are the same as they would be if the dams were not there. The proposed dam and reservoir would not be inundated during 5 year and larger floods. As noted, velocities in the reservoir would be very low as would shear stress leading to sediment deposition. Sedimentation rates of 2-3 inches are very substantial especially when put in the context of cumulative effects.

Within the FEIS, sedimentation impacts for Wolverton creek are included within the general description of effects of upstream staging. Since the LPP includes complete blockage of flows on Wolverton Creek; a separate discussion for this resource is warranted.

As part of the State EIS scoping, full disclosure must be given to potentially significant geomorphic impacts. Decreasing operational frequency and staging duration – a possibility mentioned in the FEIS - would help to minimize impacts and should be further explored.

Downstream Geomorphology

DNR agrees that the Red River is currently very stable in its form and, depending on the operation plan, a diversion by itself may not have substantial effects on downstream geomorphology. However, with the addition of a dam and prolonged discharge of high flows there are additional concerns. There would be some potential for channel enlargement due to the increased duration and frequency of bankfull and higher events from the prolonged discharge of water from the dam reservoir. Since channels forming flows are a function of the product of sediment transport rate and flow frequency, changes to either could have adverse consequences for riparian vegetation, channel stability, sediment, and habitat.

Bank Stability

The FEIS continues to provide little substantiation for the assertion that, "stability of a larger portion of the lower bank and the upper bank would not likely be affected by a small increase in duration of bankfull conditions".

The DNR maintains that exacerbation of bank failures can be expected under the LPP (as described in the FEIS). Bank erosion problems are likely to be exacerbated by several factors associated with the new dam including:

- As sediments accrete in the floodplain (reservoir), bank heights will increase, loading the banks, and increasing potential for slumping as the reservoir is drained.

- Stability of the Red River channel is heavily dependent on riparian trees which provide mechanical strength due to roots and draw moisture from the soils increasing soil critical shear

stress. Removal of riparian trees has consistently resulted in bank slumping while these slumps are relatively rare where the riparian zone is intact. Trees along the Red River are already stressed during prolonged floods and can suffer root rot that can kill younger trees in particular. This reservoir would damage the riparian corridor by creating a reservoir that would hold water higher and longer, killing riparian trees. Once dead, the trees will no longer perform the bank stabilization functions.

- Soil saturation is a major factor in bank slumping along the Red River. The reservoir will increase soil saturation by holding water higher and longer. Draining of the reservoir will also result in more sudden changes in water level in the channel; a factor frequently associated with slumping. When the reservoir is drained, these weakened soils will be prone to collapse.

- Large slumps can fill a significant proportion of the cross-sectional area of the channel. This reduced flow capacity through the cross-section results in higher upstream stage, higher velocities, and higher shear stress causing additional erosion until the cross-sectional area is regained.

A significant reduction in the frequency of operation and staging duration through design features which pass additional flows through town would greatly minimize these impacts. Since the adaptive management remedies for this condition are limited to either changing operating procedures of the dam (which would tend to defeat its purpose), or the development of a fully wooded riparian corridor (prolonged inundation of the existing wooded corridor may actually worsen conditions and limit the development of a woody corridor where none exists), impact minimization through design changes should occur upfront.

Fish Passage and Biological Connectivity

DNR acknowledges the merits of the additional fish passage channels around the Red River structure. These additional features (i.e. up to 8 fish passage channels) along with inclusion of the option of passing more water through the metro, if implemented, will go a long way in minimizing both biological connectivity and geomorphologic impacts.

DNR concerns - as stated in past comments - that fish passage should be provided through the diversion channel remains unchanged. Further, we ask that the Corps support their conclusion contained in Appendix U which states, "... *this cost would not be justified by the number of fish expected to reach the upper end of the diversion.*"

DNR concerns regarding potential impacts caused by reduced fish passage and impacts to channel morphology caused by impounding water on Wolverton Creek remain unchanged. We believe it is insufficient to address these concerns by stating, *"It is unclear if this impact is substantial enough to warrant additional mitigation beyond what has already been proposed in the FEIS"* and we believe a thorough evaluation of the potential impacts is warranted and should be addressed as part of State EIS scoping.

Wetland Impacts

Many of DNR comments pertaining to wetlands have been addressed in the FEIS; however, the FEIS still does not describe whether perpetual easements or other protections will be placed on the replacement site(s). This information was requested as part of DNR's comments on the SDEIS. Such a requirement is consistent with Corps Policy which requires that wetland replacement sites be protected through

appropriate real estate instruments such as covenants, conservation easements, or transfer of title to a public natural resource agency or private conservation organization.

DNR also requested that the FEIS provide an analysis of the potential impacts that operation of the alternatives will have on wetlands and that mitigation be provided for all impacts. In responding to this request Appendix U indicates, "*The operation of the project was considered in this analysis; no appreciable impacts to wetlands would occur due to operation of the project.*" It remains unclear how impacts resulting from operation were considered in the FEIS. DNR asks that supplemental information be provided which describes indirect impacts caused by cumulative sedimentation within the reservoir and due to changes in downstream floodplain hydraulics. This information will be required as part of State EIS scoping.

Debris and Ice

DNR's SDEIS comments recommended that the FEIS include a comprehensive study of potential ice and debris impacts of the alternatives. Unfortunately this information was not included in the FEIS. It will be important that project induced ice impacts be assessed during State EIS scoping.

Mitigation and Adaptive Management

DNR's past comments on this topic remain relevant (see attached).

General Comments:
For impacts the Corps is concluding will be less than significant - but still possible - Corps is relying on future monitoring and adaptive management/mitigation. DNR generally agrees with this approach, however; there remains an area which DNR does not agree that impacts will be less than significant and additional minimization of impacts through design changes should be pursued upfront, rather than waiting to see if impacts occur. Specifically, significant geomorphic impacts can be avoided and minimized by reducing the operational frequency.

Regardless of DNR's past comments, to date no assurance that future mitigation action will occur has been provided for potential impacts that will be verified through post operation monitoring. This lack of assurance will provide serious challenges as it relates to state permitting.

A mutually agreed upon mitigation and adaptive management plan containing the specific criteria, indicators, thresholds, response actions, costs, and assurances will be required as part of State EIS Scoping. DNR permits will also include similar mitigation provisions. DNR will continue to work with the Corps, other agencies, and project sponsors in developing a mutually agreeable adaptive management plan; however, the responsibility for plan implementation would be that of a permittee.

State Environmental Review and Permitting

As previously mentioned in our SDEIS comments, in order to comply with statutory requirements associated with Public Waters Permitting (103G) and Environmental Impact Statements (116D); DNR must require that the permit-level analysis be compiled and provided concurrently with the State EIS process. If the sponsor wishes to proceed with a State EIS before permit-level analysis can be provided, the sponsor must contact DNR's Public Waters Work Program to discuss options under which they can consent to exceed new goals for issuing permits.

Conclusion

As outlined in our comments to date, additional efforts are needed to demonstrate that the project is ecologically sustainable, the least impact solution, adverse effects can and will be mitigated, and the chosen project is consistent with other standards, ordinances, and resource plans of federal, local and regional governments. This information will be necessary for both the state environmental review and permitting processes.

Thank you for considering our input.

Sincerely,

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cc: DNR Commissioner's Office
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