

Task Order No. 5

In accordance with Paragraph 1.01 of the Agreement Between Fargo-Moorhead Flood Diversion Authority (“Owner”) and Houston-Moore Group, LLC (HMG) (“Engineer”) for Professional Services – Task Order Edition, dated **March 8, 2012** (“Agreement”), Owner and Engineer agree as follows:

1. Specific Project Data
 - A. Title: Post Record-of-Decision (ROD) Analysis
 - B. Description: Evaluate options to decrease project impacts and reduce project costs. Options for consideration include:
 - i. increasing Red River flows through town during flood events,
 - ii. moving the Red River Outlet structure north (VE-13), and possibly eliminate Storage Area 1,
 - iii. implementing land management improvements (ring dikes) for communities of Christine, Comstock, and Oxbow, ND,
 - iv. moving the Diversion and required storage/staging areas upstream (south) of Oxbow,
 - v. moving the Diversion downstream (north) of the confluence of the Red and Wild Rice Rivers, and
 - vi. reviewing options for basin wide retention.
 - C. Background: See Background information in article ii, subsections A through F of this document.
2. Services of Engineer
 - A. Increase In Flows Through Town (Attachment A – AWD-00002)
 - i. Objective: Evaluate options for increasing Red River flows beyond these planned in the Feasibility Report through Fargo-Moorhead during flood events in order to provide environmental mitigation and early project benefits while reducing the frequency of staging water and use of the diversion channel.
 - ii. Background: A potential mitigation project proposed during the Feasibility Study is to provide levees/floodwalls to pass more water through the Cities of Fargo and Moorhead in the protected area along this reach of the Red River. The primary benefit of this mitigation project would be to reduce the frequency of operation of the diversion channel and duration of staging water in the storage and staging areas. Additional flood protection structures along this reach will mitigate flood risk during flood events prior to construction of the diversion channel, and will lessen the extent of temporary flood fighting measures. The in-town flood protection structures would also help mitigate the risk for floods that exceed the 100-year event after completion of the diversion channel. An additional benefit, not included in this study, is reducing the number and cost of fish passageways for structures included in the Project.
 - iii. Scope: Develop a Technical Memorandum (TM) evaluating what permanent measures would be required to provide flood protection from between the existing 30 foot flood stage to the previously studied 37 foot stage at the Fargo Gage. Identify level of protection that could be achieved with a 50/50 match of Federal and Sponsor funding.

1. Identify benefits and impacts that would result from construction of flood protection measures, and discuss whether they should be required prior to the diversion being completed.
2. Provide cost estimates for the permanent flood protection measures, including the potential need for hazardous, toxic, or radioactive waste (HTRW) mitigation, and land costs. No field survey or determination of HTRW will be performed; instead, cost estimates for HTRW should include an allowance for HTRW, "if found".
3. Update cost estimates from the previous studies, including adding land costs and the HTRW allowance, as necessary, so that all cost estimates are on the same basis.
4. Prepare a proposed schedule for construction of the recommended approach.
5. Provide an Executive Summary of the findings and a brief, graphics-rich, PowerPoint presentation of the results suitable for a non-technical audience.
6. Deliverables:
 - a. Technical Memorandum - Alternative Evaluation for Additional Flood Protection Measures to Allow Higher Flood Flows through Fargo-Moorhead (TM 6-2.A)
 - i. Draft TM – May 29, 2012
 - ii. Final TM – June 15, 2012
 - b. PowerPoint Presentation

B. VE-13 Move Red River Outlet Structure North

- i. Objective: Conduct study evaluating VE-13, a Value Engineering proposal that recommended relocating the Red River outlet control structure and associated project features approximately 1.5 miles north of their currently proposed location. The goal of this proposal is to provide the same level of protection as provided in the Feasibility Report, while decreasing the overall cost of the project.
- ii. Background: The Local Preferred Plan (LPP) in the Final Feasibility Report and Environmental Impact Statement Fargo-Moorhead Metropolitan Area Flood Risk Management project, dated July 2011, located the Red River outlet control structure such that an outlet structure is also required for Wolverton Creek. On October 3-7, 2011, the United States Army Corps of Engineers (USACE) and the Diversion Authority conducted a Value Engineering study on the Feasibility Report. VE-13 recommended the following:
 1. Relocation of the Red River outlet control structure and fish passage approximately 1.5 miles north will:
 - a. Allow elimination of the Wolverton Creek control structure,
 - b. Require relocation of Wild Rice River control structure,
 - c. Require relocation or extension of MN tie-back levee as required to connect to new Red River outlet control structure,
 - d. Decrease the length of the diversion channel approximately 0.75 miles from new Red River outlet control structure west to the diversion channel inlet weir, and

- e. Eliminate approximately 1.75 miles of Storage Area 1 levees, and possibly all of the 7.25 miles of Storage Area 1 levees.
 - 2. New impacts resulting from this change include: new landowners are affected and the change impacts more homes.
- iii. Scope: Evaluate the following items. Include structural feasibility, hydraulic feasibility, land costs, structure costs, levee costs, and road and bridge costs in the evaluation.
 - 1. Relocation of the Red River outlet control structure and fish passage, approximately 1.5 miles north of proposed existing location.
 - 2. Deletion of Wolverton Creek control structure.
 - 3. Relocation of Wild Rice River control structure.
 - 4. Relocation or extension of MN tie-back levees.
 - 5. Relocation of diversion channel from new Red River outlet control structure west to the diversion channel inlet weir.
 - 6. Deletion of a portion of Storage Area 1 levees, and possible deletion of entire Storage Area 1.
- iv. Deliverables:
 - 1. Technical Memorandum – VE-13 Options Evaluation (TM 6-2.B)
 - a. Draft July 31, 2012
 - b. Final September 14, 2012

C. Land Management Improvements Evaluation No. 1

- i. Objective: Evaluate the proposal presented by the Mayor of Oxbow for modifications to the Communities of Oxbow, Bakke, and Hickson, assuming the maximum predicted water level in the staging area is estimated to be lower than current estimated levels after completion of upcoming studies, such that the communities could be protected by a ring dike system. Prepare a concept level ring dike plan for the community of Christine.
- ii. Background:
 - 1. The communities of Oxbow, Bakke, and Hickson are currently in the staging area of the Fargo Moorhead area flood diversion project. The Federally Recommended Project will stage water levels between 7 and 10 feet in the vicinity of these communities. However, the Diversion Authority will be performing a study of options that could possibly result in a lowering of the water elevation in these communities during operation of the diversion and the staging of water.
 - 2. The Mayor of Oxbow submitted a proposed development plan for Oxbow, Bakke, and Hickson that may be viable if the water level to be staged in this vicinity is lowered to a level that can be protected by a ring dike or levee system. The proposal presented would preserve the 18-hole golf course by relocating some of the holes, moving or re-building some structures that are currently in low areas for which protection by a levee is not possible, and providing some development to increase the tax basis and maintain the financial viability of these communities.
 - 3. During a meeting with the community leaders in Christine, it was agreed that a concept level ring dike plan would be useful to more fully understand the

effects of staged water on the community during operation of the diversion project, and determine what measures would be required to mitigate the effects of the project. The plan will show the potential alignment of the ring dike, develop height required for ring dike, and evaluate access issues during periods of water being staged. The proposal will also address the community's sewage lagoons and potential for future development.

iii. Scope:

1. Prepare a Technical Memorandum (TM) evaluating the proposed relocation and development proposal submitted by the Mayor of Oxbow. Specific items to evaluate include:
 - a. Potential for a levee to be effective as shown on the proposal. Include analysis of space available for levee construction, analyze the potential for soil conditions to support a levee that would protect the areas for a 3-foot water level in the staging area and evaluate the necessity of additional relocations.
 - b. Evaluate topography variations between the northern, southern, eastern, and western boundaries of the development to determine if a 1 foot water level at one area would allow for a water level 3 feet or less in other areas.
 - c. Viability of raising the roadway that runs between the communities such that access would be maintained during staging of water.
 - d. Discuss with the USACE Real Estate Division the potential for acceptance by USACE of this proposal if staged water in this facility would be 3 feet or less. Determine if USACE would accept new development within the Oxbow area protected by the levee system.
 - e. Meet with interested leaders and property owners in this community to determine viability of this plan.
2. Prepare a proposed ring dike system to prevent inundation of any areas of Christine during operation of the diversion project and the staging of water. Show the location of a potential ring dike, develop height required for ring dike, and evaluate access during periods of water being staged. Use previous work done by Houston Engineering during the feasibility phase of the Project.

iv. Deliverables:

1. Technical Memorandum - Oxbow Proposal Evaluation (TM 6-2.C)
2. Description of proposed levee system for Christine and concept level drawings.
 - a. Draft – May 31, 2012
 - b. Final – June 30, 2012

v. Supporting Documents:

1. Exhibit 1: Proposed Condition-2020 and Beyond- Oxbow, ND
2. Proposed Levee system maps and related material prepared by Houston Engineering

D. Move Diversion Upstream (South) of Oxbow, ND

- i. Objective: Conduct an evaluation on relocating the Diversion Channel and associated project features south of Oxbow and Hickson, ND. The goal of this evaluation is to

provide the same level of protection as provide in the Feasibility Report concept while decreasing the impacts to communities in the staging area.

ii. Background: The communities of Oxbow, Bakke, and Hickson are currently in the staging area of the Fargo Moorhead area flood diversion project. The Federally Recommended Project will stage water levels between 7 and 10 feet in the vicinity of these communities. The communities of Comstock, MN and Christine, ND are also in the staging area.

iii. Scope

1. Prepare a Technical Memorandum (TM) evaluating the proposed relocation of the Diversion Channel south of Oxbow. Specific items to evaluate include:

- a. Evaluate land availability, hydraulic and structural feasibility, new impacts, and cost savings.
- b. Discuss with the USACE the potential for acceptance by USACE of this proposal.
- c. Meet with interested leaders and property owners in newly impacted areas to determine viability of this plan.

iv. Deliverables

1. Technical Memorandum - Move Diversion Upstream of Oxbow Options Evaluation (TM 6-2.D)

- a. Draft July 31, 2012
- b. Final September 14, 2012

E. Move Diversion north of confluence of the Wild Rice and Red Rivers

i. Objective: Conduct an evaluation on relocating the Diversion Channel and associated project features north of the confluence of the Red and Wild Rice Rivers. The goal of this evaluation is to provide the same level of protection as provide in the Feasibility Report while reducing the impacts in the staging and storage areas.

ii. Background: The communities of Oxbow, Bakke, and Hickson are currently in the staging area of the Fargo Moorhead area flood diversion project. The Federally Recommended Project will stage water levels between 7 and 10 feet in the vicinity of these communities. The communities of Comstock, MN and Christine, ND are also in the staging area. These communities may be impacted less if the diversion is located north of the confluence.

iii. Scope

1. Prepare a Technical Memorandum (TM) evaluating the proposed relocation of the Diversion Channel north of the confluence of the Red and Wild Rice Rivers. Specific items to evaluate include:

- a. Evaluate land availability, hydraulic and structural feasibility, new impacts, and cost savings.
- b. Discuss with the USACE the potential for acceptance by USACE of this proposal.
- c. Meet with interested leaders and property owners in newly impacted areas to determine viability of this plan.

iv. Deliverables

1. Technical Memorandum – Move Diversion north of confluence of the Wild Rice and Red Rivers Options Evaluation (TM 6-2.E)
 - a. Draft July 31, 2012
 - b. Final September 14, 2012
- F. Review of Basin Wide Retention Options
- i. Objective: Review existing basin wide retention studies and determine if basin wide retention will reduce staging and storage volumes.
 - ii. Background: The communities of Oxbow, Bakke, and Hickson are currently in the staging area of the Fargo Moorhead area flood diversion project. The Federally Recommended Project will stage water levels between 7 and 10 feet in the vicinity of these communities. The communities of Comstock, MN and Christine, ND are also in the staging area. These communities have requested that upstream retention be studied.
 - iii. Scope
- iv. Deliverables
1. Technical Memorandum - Basin Wide Retention Options Evaluation (TM 6-2.F)
 - a. Draft July 31, 2012
 - b. Final September 14, 2012
- G. Summary Report
- i. Objective: Review draft recommendations in TMs 6-2.A through F (six total), and recommend an alternative, which may include portions of multiple individual recommendations.
 - ii. Scope:
 1. Attend workshop with Owner and PMC to evaluate alternatives and develop a recommended alternative.
 2. Prepare a draft and final Technical Memorandum.
 - iii. Deliverables
 1. Technical Memorandum – Post ROD Analyses Summary Report (TM 6-2.G)
 - a. Draft August 31, 2012
 - b. Final September 21, 2012

3. Owner's Responsibilities

Owner shall have those responsibilities set forth in Article 2 and in Exhibit B.

4. Times for Rendering Services

<u>Phase</u>	<u>Start Time</u>	<u>Completion Time</u>
All Work	March 8, 2012	September 30, 2012

5. Payments to Engineer

A. Owner shall pay Engineer for services rendered as follows:

- i. Compensation for services identified under Subtasks A through G shall be on a Time and Material basis in accordance with the Standard Hourly Rates shown in Appendix 2 of Exhibit C of the Agreement.
- ii. The total compensation for services identified under the Task Order for Subtasks A through G is not-to-exceed \$ _____ as defined in the table below.

Subtask	Assumed Distribution (\$)
A. Increase In Flows Through Town (AWD-00002)	
B. VE-13 Move Red River Outlet Structure North	
C. Land Management Improvements Evaluation No. 1	
D. Move Diversion Upstream (South) of Oxbow, ND	
E. Move Diversion north of confluence of the Wild Rice and Red Rivers	
F. Review of Basin Wide Retention Options	
G. Summary Report	
TOTAL	

B. The terms of payment are set forth in Article 4 of the Agreement and in Exhibit C.

6. Consultants:

- A. Barr Engineering Company
- B. Braun Intertec Corporation
- C. HDR, Inc.
- D. Kadrmas, Lee & Jackson
- E. Northern Technologies, Inc.
- F. SRF Consulting Group, Inc.

7. Other Modifications to Agreement: None

8. Attachments:

- A. AWD-00002 Increase In Flows Through Town
- B. Cost Justification and Recommendation

10. Terms and Conditions: Execution of this Task Order by Owner and Engineer shall make it subject to the terms and conditions of the Agreement (as modified above), which Agreement is incorporated by this reference. Engineer is authorized to begin performance upon its receipt of a copy of this Task Order signed by Owner.

The Effective Date of this Task Order is March 8, 2012.

ENGINEER:

Houston-Moore Group, LLC

Signature Date

Name

Title

DESIGNATED REPRESENTATIVE FOR
TASK ORDER:

Name

Title

Address

E-Mail Address

Phone

Fax

OWNER:

Fargo-Moorhead Metro Diversion Authority

Signature Date

Darrell Vanyo

Name

Board Chair

Title

DESIGNATED REPRESENTATIVE FOR
TASK ORDER:

Name

Title

Address

E-Mail Address

Phone

Fax