

3.4.7.3 The preliminary analyses produced information that supported further screening of the diversion alternatives at this screening step. The following paragraphs discuss conclusions drawn from the preliminary analyses that reduced the number of diversion plans retained for further analysis.

3.4.7.3.1 The initial diversion concept presented in May 2009 was a passive diversion channel without an operable river control structure; this concept was not economically justified with a benefit to cost ratio of approximately 0.65. All of the subsequent diversion concepts included a river control structure that dramatically improved performance with a modest increase in cost. Therefore, no diversions lacking a control structure were carried forward.

3.4.7.3.2 The Minnesota Short alignment outperformed the Minnesota Long alignment, and there were no significant unique benefits or avoidance of any adverse environmental effects associated with the Minnesota Long alignment, so that alignment was dropped from consideration.

3.4.7.3.3 The North Dakota East alignment outperformed the North Dakota West alignment, and there were no significant unique benefits or avoidance of any adverse environmental effects associated with the North Dakota West alignment, so the west alignment was dropped from consideration.

CONTROL STRUCTURE = DAM WITH GATES

3.5 PHASE 2, SCREENING #2

3.5.1 Refined Array of Alternatives

An array of remaining alternatives was formulated using those management measures or plans that remained following the screening described above. Between October 2009 and February 2010 these plans were refined in order to determine the NED plan and to develop a locally preferred plan to more fully address the planning objectives. The second screening in Phase 2 incorporated a traditional hydrologic analysis based on the full period of record, including the 2009 event. The hydraulic modeling was calibrated to the 2006 flood event. The alternatives were differentiated by 1) their location in either Minnesota or North Dakota, and 2) their capacity. Non-structural measures were considered as additional features in the areas immediately upstream of the diversions and in the areas near the downstream end of the diversions, where the diversions provided little or no benefit. The array of alternatives developed to greater detail was as follows:

- MN20k: Minnesota Short Diversion, 20,000 cubic feet per second (cfs) capacity
- MN25k: Minnesota Short Diversion, 25,000 cfs capacity
- MN30k: Minnesota Short Diversion, 30,000 cfs capacity
- MN35k: Minnesota Short Diversion, 35,000 cfs capacity
- ND30k: North Dakota East Diversion, 30,000 cfs capacity
- ND35k: North Dakota East Diversion, 35,000 cfs capacity
- The preceding plans with the addition of non-structural measures