

An economic analysis presented in the Waffle plan report indicated that the Waffle concept may be economically justified, but there are several outstanding technical, social and political issues and institutional arrangements that need additional development before the concept could be implemented. The Waffle concept, as described in the report, does not fit any existing Corps of Engineers implementation authorities.

It is important to note that lack of Federal economic justification does not imply that flood storage should not be built or is not justified from a regional or local perspective. On the contrary, it is probable that local jurisdictions would find compelling reasons to construct flood storage projects that are effective on a small scale. Agricultural areas and rural infrastructure located downstream of small impoundments receive substantial benefits during summer rainstorms and spring snow-melt events.

The alternative has a low level of cost effectiveness.

2.5.11 Recommendation

Flood storage should no longer be considered as a stand-alone alternative for the Fargo-Moorhead area. The flood storage concept should be retained for possible implementation to mitigate for any adverse impacts of other plans or where it can be otherwise incrementally justified. The local communities should continue to seek opportunities for storage in the basin.

2.6 TUNNELING

2.6.1 Alternative Description

Large tunnels would be used to divert flows under the communities; this would function similar to a diversion channel, just underground. It was estimated that at least three 30-foot diameter tunnels approximately 25 miles long would be needed to provide approximately 25,000 cubic feet per second capacity. Tunneling would require little real estate acquisition, very little bridge or road building or modification, and the soil in the project area is very soft and would be easy to bore. Real estate interests would still be required to tunnel under private property, and real estate would also be required to dispose of the 10,370,000 cubic yards of excavated material.

2.6.2 Effectiveness

Tunneling, similar to diversion channels, would be very effective in reducing flood risk in the Fargo-Moorhead Metropolitan area. The effectiveness of the diversion channels is presented here to demonstrate what the impacts of tunneling could be. The smallest diversion considered in the screening exercise (25,000 cfs capacity) would reduce a 0.2-percent chance event to approximately 1-percent chance stages through town, and a 1-percent chance event would be reduced to less than 10-percent chance stages. The communities begin emergency measures between the 15 and 20-year events meaning that a diversion would nearly eliminate the need for emergency measures during smaller, more frequent floods, but flood fighting would still be needed for events approximately 1-percent chance or larger. Larger diversion alternatives could nearly eliminate the need for flood fighting except for the extremely rare and large events. This alternative is highly effective.

2.6.3 Environmental Effects

This alternative would have moderate negative impacts