ENV Report 21 – *Velocity patterns downstream of a Mississippi River Dike with and without tow traffic* by Steve Maynord

ABSTRACT

The Upper Mississippi River-Illinois Waterway System (UMR-IWWS) Navigation Feasibility Study will evaluate the justification of providing additional lockage capacity at sites on the UMR-IWWS while maintaining the social and environmental qualities of the river system. The system navigation feasibility study will be accomplished by executing the Initial Project Management Plan that outlines Engineering, Economic, Environmental, and Public Involvement Plans. The Environmental Plan identifies the significant environmental resources on the UMR-IWWS and probable impacts in terms of threatened and endangered species; water quality; recreational resources; fisheries; mussels and other macroinvertebrates; waterfowl; aquatic and terrestrial macrophytes; and historic properties. It considers system-wide impacts of navigation capacity increases, while also assessing in preliminary fashion potential construction effects of improvement projects. One element of the Environmental Plan addresses the impacts of navigation on larval and adult fish. Part of the fish study evaluates the impact of tow traffic on adult fish using the low-velocity habitat found during winter months down-stream of dikes on the Mississippi River. Velocities were measured downstream of a typical Middle Mississippi River dike before and during passage of a model tow for typical winter flow conditions. Upbound versus downbound tows and tows near the dike as well as far from the dike were evaluated in the experiments. A limited set of experiments measured ambient velocities downstream of the dike when the dike is being overtopped and the effect of adding an "L-head" to the dike on velocities before and during tow passage.