

Appendix B

Scope of Work

**Bank Erosion Impact Assessment Study
for the Upper Mississippi River/Illinois Waterway**

1. General. The scope of work to be accomplished under this contract consists of developing a model to assess the risk of bank erosion based on site specific field data for existing conditions and future conditions for the Mississippi River and Illinois Waterway system.

2. Data furnished by Government. The government to the contractor will supply the following: Aquatic Areas Classification Mapping, available data on bank erosion field survey, environmental and cultural resources, and GIS mapping/ database.

3. Modeling requirements. Develop correlations between apparent navigation induced erosion and physical parameters such as proximity to narrow channel reaches, locks, and mooring/fleeting activities, soil and sediment characteristics, land uses, etc. These correlations will be developed from data collected at the 72 detailed study sites during the 1995 bank erosion field study. In order to accomplish this task, the contractor will develop a database for relevant physical parameters that were collected during the 1995 field study for both the Illinois Waterway and the Upper Mississippi River. This database is partially available in an EXCEL spreadsheet format with the remainder being in ARC/INFO GIS format. The government will furnish the GIS data in a format agreed to by the contractor. The contractor will combine these two databases using Microsoft ACCESS so that any correlations between individual variables can be easily sought in a systematic manner. The contractor will seek, beyond 72 detailed sites, additional data from the observation sites, the Navigation Chart Mapping, aerial video descriptions that could help increase the accuracy of the field data. Attributes to be considered for river banks and navigation traffic would include (but are not limited to) the following:

River Attributes:

1. Geomorphic characteristics (inside bend/outside bend/cross over/island) – radius of curvature of bend
2. Channel width
3. Relative location of thalweg sailing line
4. Fetch length and average wind direction within fetch length/river-bank orientation
5. Closeness to flow-control structures
6. Nature of bank (natural/revetment/dredge material/etc.)
7. Bench width
8. Bench slope
9. Bench soil characteristics
10. Subaqueous lateral bed slope
11. Width of vegetation coverage on bench
12. Relative location of water edge on bench at predominant river stage
13. Relative location of erosion site with respect to Lock & Dam
14. Scarp height
15. Scarp slope
16. Bank soil characteristics
17. Bank face coverage (tree roots/vegetation/etc.)
18. Land use (farms/woods/industrial/etc.) and soil characteristics
19. Background features (closeness to lakes/wetlands/etc.)

Traffic Attributes:

1. Locate major industries related to barge traffic (power plant/oil refinery/etc.)
2. Barge/leisure boats traffic records along rivers
3. Mooring activities
4. Traffic during high stages (connect with Item 10 above)
5. Tow/barge size (vary along river reach)

The contractor will develop models to assess the risk of bank erosion, which is directly related to the increase in commercial navigation and recreation traffic. The contractor will determine—based upon the data correlations for the Illinois and Mississippi rivers—if the river systems should be modeled separately or together. This model will be used to model the existing conditions (1992 commercial navigation traffic), the baseline conditions, and the future conditions without project.

Using these correlations along with 1995 erosion mapping of both rivers, the Aquatic Areas Classification Mapping and existing resource mapping, predict areas of adverse impacts where measurable increase in navigation induced erosion will likely occur with increases in navigation traffic levels. Bank reaches will be classified as low, medium, and high risk areas for navigation induced erosion. The contractor and the government will mutually agree upon the criteria for low, medium and high classification. The contractor will identify and characterize the key assumptions and uncertainties associated with the development of the bank erosion model. Considering these assumptions and uncertainties, the contractor will develop the model in a manner consistent with the fundamental concepts and methods of probabilistic risk estimation and assessment.

4. Products to be Furnished by the Contractor. The contractor will provide letter reports to the government for review of progress as the model is developed, calibrated and applied. The contractor will provide the government model software and documentation at the conclusion of the contract. The contractor will provide five copies of the draft report and thirty-five copies of the final report.