APPENDIX F:

MUSSEL STUDY
This memo was composed in response to environmental concerns regarding the affect of proposed roadway construction and its stormwater discharge on the natural habitat of freshwater mussels in the St. Croix River. In researching the affect of stormwater discharge on fresh water mussels, various governmental and research agencies, and academic institutions were consulted. From these consultations, many different research papers were found (See Appendix A for a detailed list of contacts and reviewed research documents). The research papers provided insight to the potential problems associated with the proposed project, although none of the papers were written specifically for roadways in-service or in-construction. Based on the literature review, it was determined that there are three areas that need to be addressed to avoid or minimize potential impacts to freshwater mussels and there habitat: Water Quality, Water Quantity, and Discharge Location.

WATER QUALITY

The quality of the water entering the St. Croix River is dependent upon two chief constituents, sediment and pollutants. Sediment can affect the mussels’ habitat creating a hard pan layer, decreasing the availability of food, and clogging the gills of the mussels (J. Brim Box and J. Mossa, 1999). The most effective way minimize sediment entering the receiving waters is to use erosion control devices to prohibit the initial sediment movement. These erosion control measures would be designed to meet local, state, and national standards.

A treatment system of swales, ponds, and grit chambers should be used to remove pollutants generated from the roadways.

WATER QUANTITY

The quantity of stormwater entering the St. Croix River also affects mussels. If stormwater discharge is allowed to enter the river uncontrolled, in-river erosion may take place. This erosion could decrease water quality by suspending sediment from the river bottom, and could physically displace the mussels. By limiting the proposed discharge rate and velocity of the discharge, the effects on the mussels could be minimized. The proposed discharge rate would be controlled by outlet structures and the active storage in the treatment system. The discharge velocity would be controlled primarily by pipe slopes and energy dissipation outlet structures.

DISCHARGE LOCATION

The discharge location of stormwater treatment systems would also have an effect on mussels. Certain areas in the river are more advantageous to sustaining mussel communities. Because there is some flexibility in the location of the proposed outlets, the proposed locations should be surveyed and exact locations could be chosen to minimize disturbance to the local mussel beds. If the local mussel beds are unavoidable and the discharge is deemed detrimental to the mussels’ habitat, then the affected mussel bed could be relocated prior to the construction of the proposed project.
SUMMARY

The strategy for the proposed St. Croix River crossing is to treat stormwater discharge from the roadways in a treatment train system consisting of swales, wet ponds, dry ponds, and wetlands. A treatment train system would satisfy the governing water quality and water quantity standards. In doing so, the amount of sediment and pollutants entering the St. Croix would be significantly reduced. The potential risk to the mussels would also be reduced, and their habitat improved. An additional measure mitigating the impacts to the freshwater mussels would include the placement of the discharge outlet in an area that minimizes the amount of mussels affected. If the outlet location is inflexible the affected mussels could be relocated to another location.
APPENDIX

GOVERNMENTAL AGENCIES CONSULTED

Wisconsin Department of Natural Resources, contact David Heath.

Minnesota Department of Natural Resources, contact Mike Davis.

US Fish and Wildlife Service and the National Park Service, contact Nick Rowse.

Minnesota Department of Transportation, Dr. Greg Busacker.

Environmental Protection Agency, http://www.epa.gov/cgi-bin/ecotox_quick_search

RESEARCH AGENCIES CONTACTED


ACADEMIC INSTITUTIONS CONTACTED

Ohio State University, contact Dr. G. Thomas Watters.

Macalester College, contact Dr. Daniel Hornbach.

PRIVATE INSTITUTIONS CONTACTED


REPORTS

Draft Biological Assessment, Possible Project Impacts on Unionid Mollusks and Threatened and Endangered Species, TH 36/STH 64, St. Croix River Crossing as prepared by The Minnesota Department of Transportation in conjunction with: US Department of Transportation, Federal Highway Administration, April 1999.

RESEARCH PAPERS


