7.0 WATER RESOURCES

This chapter of the FEIS provides an overview of the water resources located in the Preferred Alternative corridor, including the identification of potential adverse impacts, studies completed to understand and respond to the potential impacts, and information about the potential avoidance and mitigation measures.

7.1 SURFACE WATER

7.1.1 Affected Environment

As discussed in the DEIS, the existing land uses are primarily agricultural in the Preferred Alternative corridor. Drainage from the agricultural landscape generally flows toward the Mississippi River, often through various wetlands, small lakes and creeks. Existing roadways primarily utilize rural roadway designs where ditches and culverts are used to convey storm water. The roadway drainage system conveys runoff from trunk highways and local roads and from adjacent off-road areas.

The Preferred Alternative lies entirely within the Mississippi River watershed, which ultimately drains to the Mississippi River. The Preferred Alternative is located within two MnDNR minor watersheds of the Mississippi River. The southern and central sections of the corridor primarily drain to the Mississippi River. The northern third of the corridor drains to various wetlands and waterbodies, including Clear Lake, prior to discharging to the River.

7.1.2 Environmental Consequences

Due to the creation of an entirely new transportation corridor, the Preferred Alternative will increase the amount of impervious surface, decreasing infiltration and, therefore, increasing the quantity of storm water runoff. Although the Preferred Alternative will increase impervious area (and therefore storm water runoff), increases in total surface water discharges will be minimal due to the rural highway design, where runoff from the impervious surface runs into grass ditches that allow for infiltration and attenuation.

Residents from the Fish Lake area have contacted Mn/DOT with concerns about how regular backwater flows from the Mississippi River to Fish Lake may be impacted by the project. In response to these residents' concerns, additional hydraulics analysis was conducted, and confirmed that it is likely that the river either backs up into Fish Lake or blocks flow out of Fish Lake on a somewhat regular basis (annually or biannually). This phenomenon would also block or cause water to back up to the storm water pond that is proposed in the vicinity (Gowan Pond); the pond's normal water elevation is similar to the lake elevation. The Preferred Alternative will not result in changes to existing hydraulics, and will not contribute to an increase in the occurrence of the river's flowing into Fish Lake.

7.1.3 Mitigation

The proposed rural roadway design for the Preferred Alternative will include vegetated ditches and culverts for the majority of the new alignment as opposed to the curb, gutter and storm sewer drainage system characteristic of urban drainage design. Where possible, storm water will be directed to storm water basins throughout the corridor. Figures 3A through 3C show the location

of the proposed storm water basins. Rural drainage systems allow surface water from the roadways to more easily match existing drainage patterns, reduce the total volume of runoff and reduce peak flows through attenuation, infiltration and plant uptake. Bridge runoff will be directed to the ends of the bridge and through ponding systems, which are intended to attenuate the rate of discharge to the River. Water quality ponds, as described in the next section, may also provide opportunities to reduce peak discharge rates. Given the regular occurrence of water flowing from the Mississippi River into Fish Lake, the final design of Gowan Pond's outlet structure will include measures to prevent materials within the pond from migrating to Fish Creek. If such a commitment is determined to be consistent with Mn/DOT regulations, Mn/DOT will fund the installation of a flapgate at Fish Creek if a local government will assume ownership, including maintenance, of it.

7.2 SURFACE WATER QUALITY

The DEIS provided a substantial amount of detail about the waterborne pollutants of most concern with respect to highway storm water runoff. The FEIS discussion will focus more on the mitigative measures that have been considered for removing pollutants prior to discharge to receiving water bodies.

7.2.1 Affected Environment

It is recognized that the Mississippi River is the dominant water body in the project area. The Minnesota Pollution Control Agency (MPCA) includes the Mississippi River from the CSAH 7 bridge in St. Cloud to the northwestern limits of Anoka County in their list of "Outstanding Resource Value Waters." Specifically, this segment of the River is classified as a "Federal or State Designated Scenic or Recreational River Segment"[1]. This classification places more stringent water quality standards on the River compared to some other waters in Minnesota as per the MPCA Chapter 7050 regulations.

The DEIS emphasized that the drainage area of the Mississippi River located upstream from the project area is relatively large. Therefore, water quality of the Mississippi River within and downstream from the project area is influenced by land uses and water quality improvement practices upstream.

Existing storm water runoff in the project area is from rural/agricultural land uses and, to a lesser extent, urban land uses. Storm water flows overland to the Mississippi River through a variety of lakes and wetlands. Common pollutants from rural/agricultural and urban land uses include nutrients (e.g., nitrogen and phosphorous), pesticides, organic material that adds to biological oxygen demand (BOD) in surface waters, and sediment. Additional project area runoff can include pollutants commonly associated with roadways (e.g., vehicle exhaust, load losses, deicing agents, paint from infrastructure).

Residents of the Fish Lake area have expressed concern that the water quality of Fish Lake will be negatively impacted by the Preferred Alternative, and have sent correspondence to the project manager stating that Fish Lake is "already impaired." Fish Lake is not on the current impaired waters list of the Minnesota Pollution Control Agency (MPCA), the agency with jurisdiction

[1] Minnesota Pollution Control Agency – Northern District Brainerd Office, Upper Mississippi River Basin Information Document – Section III: Mississippi River Basin, 2000.

over water quality issues, but the lake is being monitored by the Wright County Soil and Water Conservation District and is found to have total phosphorus levels that will likely put it on the list once a sufficient amount of data is collected. The water quality function of the wetland at Fish Creek will be replaced by the storm water pond that will be constructed as a part of the Preferred Alternative.

7.2.2 Environmental Consequences

The Preferred Alternative has the potential to impact water quality because it will result in an increase in the runoff of pollutants described above. The key to responding to this potential impact is the ability to provide design features that remove pollutants prior to discharge to a water body.

The rural drainage systems proposed for the Preferred Alternative will consist of vegetated ditches, culverts and open channels. These systems reduce pollutant loading in highway runoff by promoting settlement, infiltration and plant uptake. Grass ditches within the upland drainage areas would likely be quite flat, given the relatively flat topography, promoting slow flow velocities and infiltration within the ditches, thus increasing pollutant removal. The rural drainage systems will incorporate energy dissipation measures to prevent erosion and include storm water ponds to remove roadway pollutants and contain spills, as the Mississippi River is a source of drinking water for downstream cities. Drop structures will be constructed to facilitate the delivery of storm water from the valley bluffs to storm water ponds located within the 100-year floodplain near the proposed bridge. The design of these storm water ponds involved special considerations to prevent 100-year floods from impacting the effectiveness of these features.

7.2.3 Mitigation

As previously identified, the Preferred Alternative will increase the volume and rate of runoff and the runoff will contain contaminants common to roadways. Mitigation for the majority of the impact will involve utilizing the roadside ditches and storm water basins to encourage infiltration and evapotranspiration by plants. (Roadside ditches are not included in areas adjacent to existing wetlands, in order to minimize wetland impacts to the greatest extent possible). Other best management practices (BMPs) will be incorporated as required to meet state and federal water quality regulatory requirements. These may include wet detention basins, filter strips, and infiltration areas. These features would be designed to meet the regulatory requirements in effect at the time of final design. All runoff from the project will be treated, except runoff in areas adjacent to wetlands will be filtered by roadside vegetation.

Storm water runoff from the proposed bridge will also be routed through a wet detention basin prior to discharging into the River. This level of treatment will provide water quality treatment as well as contaminated spill containment. Figures 3A through 3C show the location of the proposed storm water basins.

The design of the proposed conveyance systems also addresses potential impacts to groundwater. At the northerly terminus of the Preferred Alternative (near TH 10), the alignment lies in close proximity to the Clear Lake municipal wellhead protection area. In response to the sensitivity of this area, roads that encroach on wellhead protection areas will be constructed with additional containment features such as clay-lined ditches that will contain spills and prevent contamination to water supply aquifers.

Winter de-icing materials present special water quality concerns. Mitigation strategies for these roadway pollutants include minimization and removal/treatment strategies such as:

- Use of magnesium chloride instead of sodium chloride salt compound. (This does not resolve the chloride issue, but magnesium may be more readily removed in detention ponds than sodium.)
- Use of corn or sugarbeet-based de-icing compounds. (This reduces the sodium and chloride levels, but may result in other problems, like oxygen reduction in water bodies when these organic compounds are decomposed.)
- Mn/DOT is studying ways to further minimize the impacts of de-icing materials through monitoring timing, method and application rates. Mitigation plans for de-icing materials will be prepared closer to project construction in order to take advantage of current research.

7.3 FLOODPLAINS

7.3.1 Affected Environment

Figures 3A through 3C show the boundaries of the existing Mississippi River floodway and 100-year floodplain fringe for Sherburne and Wright Counties, as defined by the Federal Emergency Management Agency's Flood Insurance Rate Map (FIRM) for the project area. The terrain, and subsequently the floodway/floodplain width, varies greatly along the river corridor. The Preferred Alternative corridor has one gently sloping side of the River that relates to a relatively wide floodplain.

7.3.2 Environmental Consequences

A floodplain assessment was completed for the Preferred Alternative, which consisted of an analysis of the flooding risks, excavation/fill impacts, and activities that would occur in the 100-year floodplain. The assessment concluded that the floodplain will be affected by the Preferred Alternative through the introduction of a variety of project design elements, including bridge piers. The Preferred Alternative results in a transverse crossing of the Mississippi River and will likely involve filling a portion of the 100-year floodplain to minimize the overall bridge length. Fill within the defined floodway was not associated with the Preferred Alternative, as the bridges will have sufficient length to extend over the defined floodway. Further hydraulic analysis has been completed using the Preferred Alternative layout, and additional mapping of both the river bathymetrics and floodplain areas. The following discussion includes the refined analysis.

Presidential Executive Order 11988 on floodplain management sets the basis for consideration, evaluation and mitigation of floodplain impacts resulting from federally funded projects. Additionally, federal and state laws and rules establish a framework to address impacts to designated floodplains. This framework consists of four issues (discussed below) that have been evaluated to assess the impact the Preferred Alternative will have on a floodplain environment. If the assessment of these issues indicates the potential for significant floodplain impacts, then

further assessment in the form of a floodplain finding, would be required. However, as can be seen from the following discussion, no floodplain finding will be required for the Preferred Alternative, as it will not involve a substantial encroachment on the floodplain.

- **There will be no significant interruption or termination of a transportation facility that is needed for emergency vehicles or provides a community's only evacuation route due to high floodwaters.**

  The Preferred Alternative will not affect roadways needed for evacuation during periods of high floodwaters. The proposed roadway and river crossing bridge will be constructed above the 100-year flood elevation.

- **No significant adverse impacts on natural and beneficial floodplain values should result from the construction of any alternative.**

  The fill required to construct the Preferred Alternative has the potential to cause impacts on natural and beneficial floodplain values with regard to seasonally flooded ecosystems and a floodplain forest on the north side of the river. However, when compared to the total floodplain area within the watershed, the area of fill required for the Preferred Alternative is not substantial. As such, the adverse impacts have been avoided to the extent possible through careful design and construction considerations. Additionally, temporary and permanent erosion control measures will be used where appropriate and will be designed to meet regulatory guidelines. Therefore, no significant adverse impacts on natural and beneficial floodplain values will result from the construction of the Preferred Alternative. See Figure 3A for a graphical representation of the floodway and floodplain relative to the Preferred Alternative.

- **No significant increased risk of flooding will result.**

  The Mississippi River hydraulic characteristics for existing and proposed conditions were analyzed using existing HEC-2 data from the current *Flood Insurance Study* (FIS) for the corresponding river reach. Field survey data were incorporated into the existing model to provide greater detail in proximity to the proposed bridge crossing location. The bridge length will span the entire width of the defined floodway. The bridge low-chord elevation will be above the 100-year water surface elevation in accordance with the standard design practices. Table 7.1 provides a summary of the pertinent hydraulic information from this analysis.

TABLE 7.1
SUMMARY OF THE HYDRAULICS ANALYSIS FOR THE EXISTING AND PROPOSED CONDITION OF THE PREFERRED ALTERNATIVE

	$Q_{100\text{ year event}}$ (cfs)	Elev.$_{100\text{ year event}}$ (ft.)	Approx. Floodplain/Floodway Width (ft) [(1) (2)]	Approx. Bridge Length (ft)	Area of Fill in Flood Fringe (acres)
Existing	59,750	946.7	2,670/1,540	N/A	N/A
Proposed	59,750	946.8	1,770/1,540	2,000	5.2

(1) Floodplain and floodway widths at the crossing location were approximated by measuring from MnDNR's *digital floodplain/floodway boundaries*.

(2) The proposed floodplain width is calculated as the existing floodplain width minus the proposed fill area.

The results of the hydraulic analysis show that an increase of 0.1 foot in the 100-year flood stage will result from constructing the bridge and/or filling a portion of the floodplain fringe, outside of the floodway, for the Preferred Alternative. The impact is small because the embankment construction occurs in a wooded portion of the floodplain fringe that conveys a small portion of the overall discharge.

- **This project will not result in any incompatible floodplain development.**

  No incompatible floodplain development will result from constructing the Preferred Alternative since the proposed project does not provide local access in the vicinity of floodplain areas. Also, county and city ordinances govern development within the floodplain.

Based on the above assessment, no significant floodplain impacts are expected from the Preferred Alternative. Therefore, a floodplain finding is not required.

7.3.3 Mitigation

The analysis of the Preferred Alternative shows that no significant floodplain encroachment, and negligible flooding increases, will occur as a result of constructing the new roadway and bridge. However, further discussion with the appropriate governmental agencies will be necessary to set the final bridge length and encroachment on the existing floodplain to ensure impacts are minimized throughout all phases of the project.

7.4 GROUNDWATER

7.4.1 Affected Environment

Information presented in the DEIS and this section of the FEIS was taken from *Water Resources of the Mississippi and Sauk Rivers Watershed, Central Minnesota, Helgesen and Others, U.S. Geological Survey, 1975*. In addition, the Minnesota County Well index was used to determine locations of wells, soil stratigraphy, depth to bedrock and depth to groundwater. The well index is a database of all registered wells in Minnesota and includes boring logs, static water levels and well construction data.

Soils in the project area generally consist of relatively permeable sandy outwash deposits. These sandy outwash deposits extend to depths generally ranging from 100 to 200 feet below the surface and may be as shallow as 30 feet or as deep as 400 feet. Groundwater is present in this sandy soil at depths ranging from the ground surface near water bodies down to approximately 60 feet deep. In general, groundwater depth along the Preferred Alternative is 20 to 50 feet deep.

Regional groundwater movement in the project area is towards the Mississippi River. Local, smaller scale groundwater movement varies based on terrain and may be discharged to lakes and streams. In the vicinity of the river valley, the water table generally slopes down towards the elevation of the river.

While some layers of marl, clay and silt are present at varying depths, there does not appear to be a regional confining layer in the outwash aquifer. The glacial outwash aquifer is used by residential, commercial, municipal and irrigation wells. Water supply wells in the project area

are typically drilled 50 to 100 feet into the outwash where water is drawn from the permeable, sandy soil. Yields of wells vary widely and range from 100 to 1,000 gallons per minute. Wells are rarely drilled into bedrock due to its low yields.

Water supply wells are common in the study area. Most of the wells are private residential water supply wells and generally are present at each residence outside the cities of Clear Lake and Clearwater. Irrigation wells are also common in the study area. A municipal water supply well exists in the City of Clear Lake.

Due to the relatively permeable soils and lack of a continuous confining layer between the surface and utilized aquifer, groundwater supply wells in the study area are vulnerable to contamination. A wellhead protection area has been developed for the Clear Lake municipal water supply well. This wellhead protection area has a Drinking Water Supply Management Area extending approximately one mile to the northwest of the City with high, medium and low vulnerable zones mapped within the area. The wellhead protection area extends north (up gradient with respect to groundwater flow) approximately one mile from the water supply well and includes a small portion of the TH 10 roadway. Existing threats to groundwater quality in the study area consist primarily of agricultural use of fertilizers and pesticides and development within the City of Clear Lake. As described in Section 6.4, no known groundwater contamination resulting from past or present land uses exists in the corridor.

7.4.2 Environmental Consequences

Grading for project construction is not expected to intersect the water table. No permanent dewatering or direct impacts to groundwater are expected from the Preferred Alternative. Temporary dewatering will likely be required during construction of the bridge piers. Potential project-related sources of ground and surface water contaminants include spills during construction and traffic-related spills and runoff after the project is built. During construction, spills could occur from on-site transport, storage and transfer of fuels for construction equipment. After construction, spills of fuel and various hazardous materials could occur along roads primarily as the result of crashes. Road runoff can also contain contaminants such as heavy metals, salt, hydrocarbons, sediment and debris.

The potential for transportation-related spills to affect ground and surface water is a concern statewide. Permeable soils and the consequent susceptibility of groundwater contamination from surface spills is a complicating factor in the project area. A municipal water supply well is located near the north end of the Preferred Alternative corridor in the City of Clear Lake, a wellhead protection area extends north from that water supply well and includes a small portion of TH 10, and numerous private water supply wells exist along the corridor. Impacts from the Preferred Alternative are not anticipated.

Runoff from road surfaces can contain various organic and mineral pollutants. Road runoff is considered a non-point source of pollution with relatively low concentrations of pollutants, generally measured in parts per million. These pollutants generally include heavy metals, hydrocarbons, sediment and debris that can threaten the quality of surface waters if not properly controlled. Road runoff is not considered a major source of groundwater contamination due to the relatively low concentrations of pollutants in road runoff and the ability of soil to filter these pollutants as water infiltrates through soil.

Construction of additional impervious surfaces can impede recharge of groundwater. However, construction of the Preferred Alternative will not likely have a regional effect on groundwater recharge because road runoff would likely infiltrate into the permeable soils along the road ditches.

The profile of the Preferred Alternative is not likely to intersect the ground water table; thus, no substantial impacts to ground water are expected.

7.4.3 Mitigation

Measures such as vegetated filter strips along road embankments, grassed swales/ditches and detention basins will be implemented to promote infiltration/groundwater recharge of highway runoff. As discussed in Section 7.2, best management practices will be implemented as part of the proposed project to treat road runoff and to minimize water quality and drainage impacts.

The Preferred Alternative will improve roadway safety relative to existing conditions. Improved traffic flow and safety on roads will reduce overall crashes in the area, thereby preventing spills that could impact groundwater.

Although impacts to the local wellhead protection area are not anticipated, if necessary, roads that encroach on wellhead protection areas will be constructed with additional containment features such as clay-lined ditches that will contain spills and prevent contamination to water supply aquifers.

7.5 WETLANDS

This section identifies and characterizes wetlands that may be impacted by the Preferred Alternative. Refer to Chapter 7 of the DEIS for an explanation of the state and federal regulatory requirements.

7.5.1 Affected Environment

Identification and Delineation

A complete explanation of the process used to identify and delineate the wetlands in the project corridor is provided in the DEIS. The following discussion addresses only those wetlands that will be potentially impacted by the Preferred Alternative.

Classification

All identified wetlands are classified in accordance with two classification systems. The simpler of the two systems is known as the Circular 39 system, and it groups wetland basins into one "type," based on the predominant water regime. The classification system used on national wetland inventory (NWI) mapping is known as the Cowardin system. It subdivides wetland basins into different classifications if different types exist within one wetland complex. These two systems are summarized in the table below.

TABLE 7.2
WETLAND CLASSIFICATION SYSTEM DESCRIPTORS/MODIFIERS

Circular 39 System

Type 1	Seasonally flooded basins and flats
Type 1L	Seasonally flooded hardwoods
Type 2	Inland fresh meadow, saturated at or near the surface after heavy rains or seasonally
Type 3	Inland shallow fresh marsh, flooded up to 6-foot depth
Type 4	Inland deep fresh marsh, flooded up to 3-foot depth
Type 5	Inland open fresh water, flooded up to 10-foot, marshy border may be present
Type 6	Shrub swamp, flooded up to 6-inch depth

Cowardin System

System/Subsystem	Class/Subclass	Water Regime
P – Palustrine	EM – Emergent	A – Temporarily Flooded
	1 – Persistent	B – Saturated
R – Riverine		C – Seasonally Flooded
	FO – Forested	F – Flooded
L – Lacustrine		G – Intermittently Exposed
1 – Limnetic	SS – Scrub-Shrub	
2 – Littoral		H – Permanently Flooded
	UB – Unconsolidated Bottom	J – Intermittently Flooded
		D – Partially Drained/Ditched

A summary of identified wetlands that will be potentially impacted by the Preferred Alternative is presented in Table 7.3 below, and further described in the text. This table includes information on each wetland type, size, dominant vegetation and topographic setting. Locations of these wetlands are shown on Figures 3A through 3C in Chapter 3 of this FEIS.

The wetlands identified in the project area generally consist of either floodplain wetlands in the river valley or depressions in the surrounding outwash plain. Most of the identified wetlands are vegetated with cattails and/or reed canary grass. Surrounding uplands are commonly agricultural fields. A functional analysis, using the Minnesota Routine Assessment Method (MnRAM) Version 3.0, was completed for wetlands that will be impacted by the Preferred Alternative. Indicators of high levels of functionality are noted with respect to potential impacts in Section 7.5.2. Results of the functional analysis, discussed below, will be used to develop appropriate mitigation.

With the exception of Fish Creek, which is a flow-through wetland, all of the wetlands within the project corridor are topographically isolated basins. The Minnesota Wetland Conservation Act (WCA) regulates all wetland impacts, regardless of topographic setting. The Corps of Engineers (COE) jurisdiction, as established by the recent U.S. Supreme Court Carabelle/Rapanos decision, requires that the COE "establish a significant nexus [to navigable waters of the U.S.] on a case-by-case basis when seeking to regulate wetlands based on adjacency." Isolated basins with no surficial connection to a water of the U.S., therefore, are generally not regulated by the COE. An isolated basin, however, may still provide adequate waterfowl habitat, creating an interstate

commerce connection to a navigable water. On August 23, 2006, the Technical Evaluation Panels (TEP - as established under WCA) for Wright and Sherburne Counties met to review the general delineation work and the topographic setting designation for each of the wetlands. TEP concurrence, on behalf of the COE, was obtained for the wetland delineations and topographic settings as described below.

TABLE 7.3
WETLAND INVENTORY

Wetland Basin Number	Section, Township, Range	Total Size (acres)	Wetland Type (Circ 39/Cowardin)	MnDNR No.	Dominant Vegetation	Topographic Setting
Fish Creek	NW ¼ SW ¼ SW ¼ Sec 7, 122N, 26W	0.22	Type 5(Water channel)/ PUBG	-	Cattails, tussock sedge, pond lilies, open water	Flow-through
C-2	SE ¼ NW ¼ Sec 24, 123N, 30W	1.35	Type 3/PEMC	-	Cattails, sedges, sweet flag, reed canary grass	Isolated
C-3	SE ¼ SE ¼ NW ¼ Sec 24, 123N, 30W	0.9	Type 3/PEMC	-	Willow, sedges, Scirpus sp, Reed canary grass	Isolated
BC-1	SW ¼ NW ¼ SE ¼ Sec 1, 123N, 30W	0.75	Type 2/PEMB	-	Reed canary grass	Isolated
BC-2	NW ¼ NW ¼ SE ¼ Sec 1, 123N, 30W	4.25	Type 4/ PEM/UBF	-	Cattails, open water	Isolated
BC-3	SW ¼ SE ¼ NW ¼ Sec 1, 123N, 30W	5.01	Type 4/PUBF	-	Cattails, duckweed, open water	Isolated
BC-4	NW ¼ NW ¼ Sec 1, 123N, 30W	30+	Type 5(Lake)/ PUBG	157P Cater Lake	Open water	Isolated
Mitigation Area	NE ¼, SW ¼ Sec 1, 123N, 30W	0.67	Type 3/PEMCx		Newly established vegetation	Isolated

The river channel was inspected at the Preferred Alternative river crossing. The majority of the floodplain area in the river valley is not flooded frequently or long enough to create wetland conditions. Wetlands adjacent to the river were generally confined to a narrow band of wooded area along each bank. No impacts are anticipated to these riverside wetlands.

As noted above, a functional analysis of the impacted wetlands was completed using MnRAM 3.0. None of the wetlands evaluated provide any commercial use or restoration potential, therefore these wetland functions are not applicable. In addition, the groundwater interaction for all of the wetlands evaluated is a combination of recharge and discharge. Finally, none of the wetlands, except for BC-4 (fringe to Cater Lake) provide shoreland protection, so this function is only addressed in the discussion for BC-4. No MnRAM analysis was completed for the newly created Mitigation Basin. Functional analysis of the Mitigation Basin may be completed for final permitting after the area has had an opportunity to become established and stabilized, generally identified through the five-year monitoring requirement.

At the southernmost end of the project area on the western edge of I-94, the outlet for Fish Lake (MnDNR 183P) is referred to as Fish Creek. According to MnDNR Division of Waters staff, Fish Creek is not a MnDNR Protected Watercourse. Fish Creek is a deep channel with an average depth of approximately three feet, and there is little to no associated wetland area outside of its banks. Fish Creek is the outlet channel from Fish Lake to the Mississippi River. This watercourse provides a moderate level of maintenance of the overall hydrologic regime and flood storage, as it is a relatively unrestricted channel with some additional area for storage. For maintenance of downstream and wetland water quality, low inputs from the surrounding land uses allow this wetland to provide a high level of functionality under existing conditions. Because it is a watercourse directly connected to a lake and the Mississippi River, Fish Creek provides high quality fish habitat and does not provide amphibian habitat. Wildlife habitat is only rated as moderate due to the substantial wildlife barriers presented by I-94 and the local roadway. Aesthetics, recreation and educational benefits are also moderate due to proximity of the roadways and the culvert and bridge structures in the area balanced by direct access by the public from Fish Lake. Sustainability of Fish Creek due to storm water inputs is high, because it does not receive direct, untreated storm water. Any future changes would require treatment, however, to maintain this sustainability.

The evaluation of Wetlands C-2 and C-3 resulted in nearly identical findings across the board. Only the vegetative communities exhibit slightly different ratings. Both the shallow and deep marsh portions of Wetland C-2 receive a high rating, because they have a diverse assemblage of native plant species (including sedge species [*Carex sp.* and *Scirpus sp*.] and blue flag iris [*Iris versicolor*]), and reed canary grass and cattails comprise less than 40 percent cover. The shallow marsh portion of Wetland C-3 has a high vegetative rating because of the diverse community that includes willows, lake sedge (*Carex lacustris*) and willow herb; however the wet meadow portion receives a low rating because it is dominated by reed canary grass. Both isolated basins provide a high level of function in maintenance of hydrologic regime, flood storage, and wetland and downstream water quality. Amphibian habitat is provided at a high level, and the calls of chorus and other frogs were heard at both basins during the evaluation. Because the wetlands do not receive untreated storm water inputs, they are considered highly sustainable within the landscape and do not require additional storm water treatment. The wildlife habitat function is rated at a moderate level because they are surrounded by a mix of native and non-native

grassland and sparse forested habitat. Fishery habitat of these isolated basins is considered low because, even though they hold standing water for much of the season, they are not connected to a permanent water body.

Wetland BC-1 is a reed canary grass-dominated depression adjacent to TH 10, and this monotypic vegetation community is considered of low quality. This wetland generally provides a low to moderate level of functionality across all areas evaluated because it is sandwiched between the highway and a stockyard exchange company. The one area for which this wetland provides a high level of function is protection of downstream water quality, by providing an opportunity for treatment of water within the basin. Its wildlife and amphibian habitat functionality is moderate because of the proximity to TH 10 and the stockyard. The calls of chorus frogs were heard during the evaluation. The aesthetics/recreation/education function of this wetland is moderate because while it is highly visible, it is not easily accessible to the public.

Wetland BC-2, a shallow to deep marsh surrounding a shallow open water community, has vegetative communities that are rated moderate to high in diversity and integrity. While there is a relatively diverse assemblage of native vegetation, including multiple species of sedges and forbs, reed canary grass and cattails make up over 40 percent of the vegetation in the marsh communities. This isolated depression provides a high level of function for maintaining the hydrologic regime and downstream water quality. Its ability to provide flood storage is rated as moderate because the opportunity to provide flood and storm water storage and attenuation within the watershed is not substantial. Its storm water treatment needs are moderate, because it does receive some untreated runoff from the adjacent land uses and therefore is not as sustainable within the landscape as if it received no untreated runoff. Wildlife and amphibian habitat are both rated as moderate because of the proximity of TH 10 and the stockyard. Mallards, a grebe species, Canada geese and another unidentified small waterfowl were observed using the wetland during the evaluation. The aesthetics/recreation/education function of this wetland is moderate because while it is highly visible, it is not easily accessible by the public.

Wetland BC-3 is a shallow to deep marsh surrounding a small area of shallow open water. BC-3 is located in close proximity to TH 10 at its southern end and is protected from the highway by a forested upland knoll along the rest of its boundary. Its vegetative communities have moderate diversity and integrity, because there is a relatively diverse assemblage of native vegetation, but reed canary grass and cattails make up over 40 percent of the vegetation in the marsh communities. This wetland provides a high level of function in the hydrologic areas of maintaining the hydrologic regime, protecting downstream and wetland water quality, and providing flood and storm water storage and attenuation. It also receives no untreated storm water, therefore it is considered highly sustainable within the landscape. This wetland provides a moderate level of function for wildlife, fishery and amphibian habitat, as well as aesthetics/recreation/education. The calls of chorus and other frogs were heard during the evaluation. It is close to TH 10, which creates a substantial wildlife barrier, and is not easily accessible to the public. It may become connected to nearby Cater Lake (BC-4) during high water times, therefore potentially providing access for fish.

Wetland BC-4 is a lacustrine fringe to Cater Lake, a MnDNR Protected Water (157P). This wetland provides a high level of function in maintaining the hydrologic regime and downstream and adjacent wetland water quality. As a lacustrine fringe, this wetland provides high function for fishery habitat. The amphibian habitat function is considered not applicable, due to the likely

fish presence. No calls of frogs were heard at this wetland during the evaluation. The shoreline protection function of this wetland is rated as moderate, because it is a narrow band of wetland with the presence of weak-stemmed emergents to provide only moderate resistance to erosive forces. The edge of the wetland is a steep slope up to TH 10. While the proximity to TH 10 creates a substantial wildlife barrier, the wildlife habitat function is rated high because Cater Lake is known to be used by a widely diverse assemblage of water fowl. The aesthetics/recreation/education function is high for the wetland adjacent to a lake, with high potential for recreational use.

7.5.2 Environmental Consequences

Preliminary construction limits were compared to delineated wetland boundaries to estimate the area of potential fill impacts, and these are summarized in Table 7.4. High quality or rare wetland features present are also listed **in bold type** in the table. Table 7.5 identifies the total area of potential wetland impacts by Circular 39 wetland types.

TABLE 7.4
WETLAND IMPACT SUMMARY

Wetland Basin Number	Total Wetland Area (Acres)	Estimated Area of Direct Impact (Acres)	Percent of Wetland Impacted	Wetland and Highly Rated Function Impact Description
Fish Creek	0.22	0.11	50	Fill impact for extension of culvert under I-94. **Downstream and wetland water quality, fishery habitat, storm water sensitivity and treatment needs.**
C-2	1.35	0.0	0	Treated storm water inputs from "Sherburne Pond". **Vegetative community, maintenance of hydrologic regime, flood storage, wetland and downstream water quality, amphibian habitat, storm water sensitivity and treatment needs.**
C-3	0.90	0.11	12	Fill impact to reed canary grass portion of wetland adjacent to existing road. **Shallow marsh vegetative community, maintenance of hydrologic regime, flood storage, wetland and downstream water quality, amphibian habitat, storm water sensitivity and treatment needs.**
BC-1	0.75	0.75	100	Fill impact to reed canary grass depression/drainage way adjacent to TH 10. **Downstream water quality.**
BC-2	4.25	4.25	100	Fill impact to entire open water basin. **Vegetative community, maintenance of hydrologic regime, downstream water quality, storm water sensitivity.**
BC-3	5.01	0.57	11	Fill impact to deep marsh along an adjacent wooded upland. **Maintenance of hydrologic regime, flood storage, wetland and downstream water quality, storm water treatment needs.**
BC-4	30+	0.0	0	No impact to edge of Cater Lake along TH 10.
Mitigation Basin	0.67	0.67	100	Fill impact to recently excavated shallow marsh.
Total		**6.46**		

TABLE 7.5
ESTIMATED TOTAL WETLAND IMPACTS BY WETLAND TYPE (CIRCULAR 39)

Type (Circ. 39)	Acres
2	0.75
3	0.78
4	4.82
5	0.11
TOTAL	**6.46**

Wetland C-2 is a small cattail and reed canary grass-dominated depression adjacent to agricultural lands and low density residential housing that would receive treated storm water inputs from the "Sherburne Pond" storm water treatment basin, but is not anticipated to be directly impacted by the Preferred Alternative. Wetland C-3 is also a small depression adjacent to agricultural lands and low density residential housing that would be partially filled by road construction. Wetlands BC-1, BC-2 and the Mitigation Basin would be completely filled by construction of the interchange with TH 10. The potential impact to Wetland BC-3 would occur along its southern boundary where grassy and wooded upland is adjacent to the wetland.

Fish Creek will be impacted by the southbound acceleration lane from the proposed interchange, which will require that the Fish Creek culvert crossing under I-94 be extended approximately 10 feet toward Fish Lake. The elevation and capacity of the culvert will not be altered; therefore, lake levels of Fish Lake will not be affected by this culvert extension (the main concern of MnDNR Division of Waters). This culvert extension will result in wetland impact, which will be mitigated through the permitting process. Staff from the Wright County Soil and Water Conservation District and the MnDNR Division of Waters have reviewed this potential impact and do not have any initial concerns with the proposal.

7.5.3 Sequencing

Federal and state wetland regulations require the use of a sequenced approach to project design when projects have potential impacts on wetlands. Sequencing requires first avoiding wetland impacts if possible, and if impacts are not avoidable, they must be minimized to the greatest extent practicable. Sequencing also includes rectification of temporary impacts and reduction or elimination of impacts over time. After all options for avoidance, minimization, rectification and long term reduction of impacts have been considered and implemented, compensation that will replace lost wetland functions is required for those impacts that are not avoidable.

The overall need that the proposed project is intended to address is a high-speed, freeway to freeway, interregional corridor connection between I-94 and TH 10, which are both heavily traveled interregional corridors. A number of transportation policies, studies, and forecasting efforts led to the recommendation to build a connection between I-94 and TH 10 between St. Cloud and Becker (refer to Chapter 2 of the DEIS and this FEIS for additional detail).

The DEIS was undertaken to study corridors within the area between St. Cloud and Becker. Four corridor alternatives were studied, including an alternative which would upgrade the existing alignment (Alternative B) (refer to Figure 1 in this FEIS). Each corridor was evaluated for, among other factors, its ability to avoid or minimize wetland impacts; all alternative impacts were balanced against each other to determine which alternative presented the best overall compromise. Resource agencies (e.g., Army Corps of Engineers, MnDNR) were involved in evaluating each of the DEIS alternatives' impacts, and in ultimately identifying the best overall corridor. The analysis conducted in the DEIS was a preliminary wetland impact assessment, and reported potential wetland impacts ranging from 5.3 acres to nine acres. Alternative C in the DEIS was estimated to impact 6.3 acres of wetlands, the second lowest impact alternative. In its analysis of the DEIS alternatives, the MnDNR concluded that "Alternative C [the Preferred Alternative] could have the least environmental impact while still satisfying the purpose of the proposal" (see March 23, 2004 letter in Appendix A). Furthermore, Alternative C fits the area's traffic patterns better than the other DEIS alternatives.

7.5.3.1 Avoidance and Minimization

Efforts to avoid wetland impacts from the proposed river crossing began when potential alignments were being developed. To the greatest extent possible when balancing other project needs, the initial corridors considered in early scoping documents were selected in areas where wetlands and lakes were not abundant. Subsequent to the identification of Alternative C as the Preferred Alternative, minor shifts in the alignment during the FEIS development further avoided wetlands where possible. Complete avoidance of wetland impacts was not possible due to the need to balance avoidance of other impacts, such as property acquisition, while satisfying the transportation need with a cost effective project. Although specific road location designs were used or considered to avoid the wetlands in the project area, construction of the Preferred Alternative will affect **6.46** acres of wetland area.

Minimization of wetland impacts where avoidance could not be achieved was considered during the design of the Preferred Alternative, as well as in the modifications that have been made since the DEIS. These measures included reducing centerline spacing in order to minimize the Preferred Alternative's cross-section, not including roadside ditches in areas adjacent to existing wetlands, and reducing the design speeds of some project ramps in order to minimize wetland impacts to the greatest extent possible. It should be noted that more detailed information and mapping was available for this FEIS analysis than was available during the DEIS analysis. This has permitted a more accurate understanding of potential wetland impacts and resulted in a higher acreage of impact than was reported in the DEIS.

- **North Area (Figure 3C)**

  Avoiding impacts to wetlands in the north end of the project area (along TH 10) was particularly challenging for a number of reasons. There are a number of complex factors that informed the location of the Preferred Alternative's alignment in this portion of the project area. The existence of the Burlington Northern Santa Fe railroad on the **south** side of TH 10 limits options in this area considerably because it fixes the southerly limits of the roadway alignment and interchange configuration. Furthermore, moving the TH 10 interchange ramps further **south** would substantially impact a wellhead protection area. Shifting the alignment to the **north** would result in greater wetland impacts to the

wetland complex including Wetlands BC-3 and BC-4, and any shift to the **north** would be limited by the need to tie back into adjacent segments of TH 10. Moving the alignment to the **west** would impact the large wetland complex associated with Imhoulte Slough and Cater Lake. Additionally, shifting the alignment to the **west** or **east** would interfere with the objective of keeping the Preferred Alternative on the alignment of existing 70th Avenue to maximize the project's transportation efficiency. Its location here is oriented to fit traffic patterns; shifting it away from 70th Avenue would result in greater project impacts, particularly to property acquisitions and relocations. An alignment shift to the **east** in order to avoid wetland impacts in the northern project area would create significant impacts to downtown Clear Lake and would have a negative impact on the at-grade intersection with CSAH 6 (which would pose a safety hazard). Such a shift would also result in greater impacts to the Clearview Elementary School property further south on the alignment.

In the north project area, impacts to Wetland BC-4 (Cater Lake), a MnDNR-protected water, have been avoided. This avoidance is due to a three-part design modification. The design speed of the ramp from northbound river crossing to westbound TH 10 was reduced to 60-mph, which allows an earlier tie-in to westbound TH 10 than the DEIS design. In addition, the Preferred Alternative's alignment along mainline TH 10 was tightened by shifting the centerline approximately 24 feet to the south, introducing median barriers in this segment, and reducing shoulders between TH 10 and Cater Lake from 10 feet to six feet. Finally, the roadway profile was lowered in this area in order to allow the project to stay out of the lake. Each of these revisions allows the Preferred Alternative to avoid impacts to Wetland BC-4.

Project designs were modified when possible to minimize wetland impacts. The design modifications discussed above to avoid impacts to Wetland BC-4 have also resulted in minimized impacts to Wetlands BC-3 (0.57 acre) to the extent practicable.

The Preferred Alternative fully impacts Wetland BC-1 (0.75 acre), Wetland BC-2 (4.25 acres) and the Mitigation Basin (0.67 acre). These impacts were not avoidable or able to be minimized for many of the reasons described above. The alignment is located here in order to minimize impacts to other wetlands, the railroad, the wellhead protection area, and downtown Clear Lake; to maximize the project's transportation efficiency by following the existing alignment of 70th Avenue; and to provide a safe distance from the at-grade intersection with CSAH 6.

- **Middle Area (Figure 3B)**

  The Preferred Alternative avoids direct impacts to Wetland C-2. Avoidance of this impact is due to the reduction in centerline spacing and to the fact that no drainage ditch is included in this area. This wetland will receive treated storm water inputs from the "Sherburne Pond" storm water treatment basin (Sherburne Pond is designed for the one-year storm event; its final design will likely include a skimming device that would provide further treatment for the two- to five-year storm event).

  The alignment modification that has been made subsequent to the DEIS results in a 0.11-acre impact to Wetland C-3, which was not impacted by the DEIS Alternative C. The wetland impact due to this alignment shift is considered unavoidable because the shift was in

response to the need to avoid impacts to existing properties and center-pivot irrigation systems, and to maintain the viability of agricultural uses in the area. However, the impact was minimized to the extent possible by reducing centerline spacing to minimize the project's cross-section and by not including a drainage ditch (which would result in greater impacts to the wetland) in this area.

- **South Area (Figure 3A)**

  The modification of the Preferred Alternative has resulted in avoidance of a wetland impact that was anticipated in the DEIS evaluation: impacts to Wetland C-1, which would have been completely filled (0.2 acres) with the DEIS alignment have been avoided as a result of the alignment modification discussed in this FEIS.

  The 0.11-acre (4791.6 square feet) impact proposed to the Fish Creek wetland area includes the extension of the existing culvert (by approximately 10 feet) for the channel between Fish Lake and the Mississippi River. This impact is required and is unavoidable in order to meet design standards for the southbound acceleration lane from the I-94 interchange. However, it has been minimized to the greatest extent possible by reducing the design speed of the southbound river crossing to eastbound I-94 ramp to 60-mph, thereby changing the location of the acceleration lane. This revision resulted in a reduction of the wetland impact, from a 20-foot culvert extension impacting 0.16 acre (6969.6 square feet). Because the purpose of the proposed project is to provide a free-flowing freeway connection, the ramp's design speed cannot be reduced any further and necessitates the acceleration lane length as shown on Figure 3A.

7.5.3.2 Replacement

Replacement of lost wetlands will be in accordance with current Minnesota Wetland Conservation Act (WCA) criteria, Clean Water Act Section 404, and the Minnesota Department of Natural Resources Public Waters requirements. Replacement will occur prior to or concurrent with the impacts, and every effort will be made to replace all lost functions and values.

Wetland mitigation is an on-going development during the early stages of project design, and therefore is subject to change. After specific sites are chosen, detailed mitigation site plans are developed as the construction plans near completion. Replacement sites are sought first within the area of the project, next within the same watershed, then within the same county, next within an adjacent county, and finally within the remainder of the state. This concentric approach assures that lost wetland acreage, along with functions and values, are replaced as close to the impacts as possible. All replacement sites are monitored to assure that targeted wetland size and type have been attained. Additionally, they are protected by covenants and restrictions, as required by the Minnesota Wetland Conservation Act.

Three potential wetland replacement sites have been identified for the Preferred Alternative. The first is within the project area (Section 12, Township 34 North, Range 30 West), to the northwest of Imhoulte Slough. This site may be used to mine gravel for the construction of the Preferred Alternative; following construction, the site would be a potential option for wetland creation. The site has the potential to create wildlife habitat value and water quality value and would create approximately six to eight acres of new wetland credit. The site will be further investigated as the design process continues.

A second potential wetland replacement site has been identified in Sherburne County. The site is located on a property in Section 4 of Palmer Township. This would be a wetland restoration site yielding approximately five to 10 acres of new wetland credit. This site would have the potential to create wildlife habitat value; it is located next to two additional wetlands as well as upland woods. It also has the potential to create water quality value by treating water before it continues downstream into Rice Lake. Additionally, this restoration site could be restored to a type 6 or type 7 wetland community. It is located in the same watershed as the Preferred Alternative (the Mississippi River St. Cloud watershed) and will be further investigated as the design process continues.

The third potential wetland mitigation site has been identified in Benton County, in the Mississippi River (Sartell) watershed. This site would involve plugging an existing drainage ditch and has the potential to create approximately 15 to 25 acres of new wetland credit. This site will also be further investigated as the design process continues.

The Stearns County, Wright County, Sherburne County, and Benton County Soil and Water Conservation Districts and the Department of Natural Resources have also been contacted to identify potential sites. In addition, the Clearwater River Watershed District has been contacted; however no additional options were identified.

Every effort will be made to mitigate losses on the project site. However, if the district is unable to locate sufficient acreage of suitable on-site mitigation, the wetland impacts will be replaced by utilizing the Combined Wetland Road Program, which is the wetland replacement cooperative established between Mn/DOT and the Board of Water and Soil Resources.

7.5.4. Only Practicable Alternative Finding

Based upon the above considerations, it is determined that there is no practicable alternative to the proposed construction in wetlands and that the Preferred Alternative includes all practicable measures to minimize harm to wetlands which may result from such use. The presence of wetlands throughout the project area, particularly on the north end, makes complete avoidance of wetland impacts not possible. No practicable alternative exists that will further or completely avoid wetland impacts that also meets roadway safety design standards, avoids other resources or barriers, and provides for access and realignment needs. Remaining unavoidable impacts were minimized to the extent practicable within these constraints. This project will achieve a no net loss of wetland quantity and quality through wetland replacement, and will preserve and enhance the natural and beneficial values of replacement and avoided wetlands.