VIII. PRELIMINARY ENVIRONMENTAL ASSESSMENT

A. Environmental Assessment of Alternatives Considered:

One criterion used in evaluating alternatives was the potential environmental impacts and enhancement opportunities. The potential impact of each alternative is a part of the environmental review for that alternative. If the alternative has potential negative impact, the alternative received a lower ranking than one with a lesser impact. If an alternative has more potential for enhancement, its ranking is higher. Factors that affect the rankings are land acquisition and easements; environmental mitigation activities and environmental enhancement activities.

Construction of the dams, berms, culverts and other improvements could result in erosion and runoff problems during the process. The construction sites will be prepared and maintained in accordance with EPA's construction site erosion and sediment control measures. Any site that disturbs more than 5 acres will require a Notice-of-Intent to be filed with SDDENR to meet the Stormwater regulations regarding Construction. Best management practices will be used for storm water and erosion control which include:

- Staged construction that would allow one to stabilize before disturbing another.
- Silt Fences.
- Straw bale dikes.
- Water Bars.
- Riprap.
- Revegetation.

Environmental Mitigation Activities may include revegetation of grassed areas disturbed. Environmentally sensitive areas would be avoided if possible. Environmental Enhancement Activities may include the

restoration of wetlands and upland game propagation by establishing grassed waterways.

Air quality impacts resulting from the proposed project(s) would all be short-term (occurring during construction) and occur at low levels. Impacts could result from equipment emissions and fugitive dust. Emissions would be mitigated keeping all construction vehicles well maintained and by watering construction areas during dry periods. State ambient air quality standards would not be exceeded as a result of the proposed action. The constructed earthen dams, berms, culverts and bridges would have no impact to air quality once constructed.

Noise levels within the project area could exceed background noise levels for short periods. Noise impacts would occur during construction and be moderate in intensity but are not expected to exceed levels produced by existing farm machinery presently used in the area. To mitigate disturbance of local residents, all internal combustion construction equipment would have mufflers and local residents would be provided work schedules for their area prior to initiation of construction. Once construction is complete, there would not be any noise pollution associated with the project.

The South Dakota Historical Society, SDDENR, SDGF&P and Corps of Engineers will be given an opportunity to review this report for historical/archaeological and environmental significance.

B. Comprehensive Plan #1

1. Project 1 - Construct Detention Dam North of the City Limits:

Land Acquisition: Land acquisition or easements would be required to construct the proposed dam. There are several approaches to land acquisition. Listed below are some of the approaches that may be utilized:

- The City of Madison and Lake County could purchase the land to construct the dam and purchase perpetual easement for the land that would be inundated with water. The easement agreement may include payment for crop damage or the easement agreement may be a lump sum agreement that would include all future crop damages.

- The City of Madison and Lake County could purchase the land for the detention dam and all of the land that would be inundated with water and rent out the farm ground.

- The City of Madison and Lake County could purchase the land for the detention dam and the portion of land that would be inundated with water on a frequent basis. The remaining land could have a perpetual easement from the property owner(s).

These are not presented as the only method of obtaining the land for the construction of the dam but merely as a starting point for discussion. The final agreement must be worked out by the local governments and the land owner(s). In all cases, the land should be appraised so that a fair market value is established.

Environmental Mitigation/Enhancement: This detention dam could be constructed to enhance wildlife in the area. The low flow channel could be planted with grass for upland game propagation as one option. The outlet piping could be modified to provide a small pool as a wetland area for waterfowl propagation. The final design concept would vary depending on the land acquisition and lease agreements negotiated with the property owner.

Socioeconomic Affects: The construction of this dam would benefit the residents in the City of Madison by reducing and controlling the peak flow through the city. Flood damage and

personal property damage within the city limits would be reduced with the construction of this dam.

Lake Madison and Brant Lake would benefit from this detention dam by the reduction of the peak flow. Water quality would be enhanced by the reduction of sediment transport.

Two residents above the dam will be negatively impacted by the water impounded behind the dam. The houses are above the expected high water mark at both sites. The barns and livestock holding areas are within the area that would be flooded during the 100-year storm at the Giles building site. These two sites were surveyed to determine the ground elevation and determine the location and elevation of buildings that may be impacted by the construction of the dam and associated water. The surveyed and 100 year flood elevations are as follows:

Location	Elev.	Comments	100 Year Flood Elev.
Giles Building Site			1701
House	1704.5	ground elevation	1701
House floor elev.	1706.0		1701
Shed	1698.0	East side	1701
New Building	1695.4	South side	1701
Chicken Coop	1700.0		1701
Barn	1699.3	East side	1701
Grainary	1696.2	East side	1701
Township Road	1694.4	Centerline	1701
Driveway	1694.7		1701
Jung Building Site			
North House	1708.1		1701
House	1707.5		1701
Top of Foundation	1709.5		1701
Garage	1708.5		1701
Hog House	1705.1		1701
Driveway	1707.7		1701

The topography of the land may allow each location to be protected by filling in the area in question or building berms to contain the high water from the dam. A perpetual easement agreement or building relocation may be another option that could be explored.

2. Project 2 - Construct Detention Dam West of the City Limits:

Land Acquisition: An agreement with South Dakota Department of Transportation and land acquisition or easements would be required to construct the proposed dam. Securing land acquisitions would be similar to the methods previously discussed in Project 1.

Environmental Mitigation/Enhancement: This detention dam could be constructed to enhance wildlife in the area. The low flow channel could be planted with grass for upland game propagation as one option. The outlet piping could be modified to provide a small pool as a wetland area for waterfowl propagation. The final design concept would vary depending on the land acquisition and lease agreements negotiated with the property owner.

Socioeconomic Affects: The construction of this dam would benefit the residents in the City of Madison by reducing and controlling the peak flow through the city. Flood damage and personal property damage within the city limits would be reduce with the construction of this dam.

Lake Madison and Brant Lake would benefit from this detention pond by the reduction of the peak flow. Water quality would be enhanced by the reduction of sediment transport.

There are not any residents above the dam that would be negatively impacted by the water impounded behind the dam.

3. Project 3 - Upsize and or Modify Existing Structures:

Land acquisition: Land acquisition or easements would not be required to construct the proposed improvements. Each improvement would be constructed within the existing street right-of-way.

Environmental Mitigation/Enhancement: The construction of the larger structures would have minimal environmental impact. Transition sections could be designed that blend in with the existing rock and mortar wall. Each site would be planted to grass as necessary to prevent erosion.

Socioeconomic Affects: The construction of the larger structures would benefit the residents in the City of Madison by reducing and controlling the peak flow through the city. Flood damage and personal property damage within the city limits would be reduced with the construction of the proposed structures, not only for the 100-year flood, but also for the more frequent floods.

C. Comprehensive Plan #2

1. Land Aacquisition: Land acquisition or easements would not be required to construct the proposed improvements. Each improvement would be constructed within the existing street right-of-way.

2. Environmental Mitigation/Enhancement: The environmental enhancement would be associated with construction of the larger structures. Transition sections could be designed that blended in with the existing rock and mortar wall. Each site would be planted to grass as necessary to prevent erosion.

3. Socioeconomic Affects: The construction of the larger structures would benefit the residents in the City of Madison by reducing and controlling the peak flow through the city. Flood damage and personal property damage within the city limits would be reduced with the construction of the proposed structures not only for the 100-year flood but also for the more frequent floods.

IX. RECOMMENDED PLAN

A. General: The recommended plan is Comprehensive Plan No. 1 which consists of three projects. The projects have been identified as follows:

Project 1 - Detention Dam North of the City Limits
Project 2 - Detention Dam West of the City Limits
Project 3 - Upsize and or Modify Existing Structures.

B. Project 1: Construct Detention Dam upstream of Madison on Park Creek. The detention dam north of Madison would be approximately 32' high and would pond water up to elevation 1701 during the 100-year flood. The dam would be constructed with earth and roller compacted concrete with three 48" outlet pipes with control gates in the low flow channel. This detention dam will decrease the peak flood flow from 4340 cfs to 330 cfs at the north City Limits.

The Opinion of Probable Project Cost for Project 1 is summarized as follows:

Construction Cost	$1,106,000
Contingencies	$ 166,000
Engineering & Administration	$ 222,000
Land Acquisition	$ 256,000
Opinion of Probable Total Project Cost	$1,750,000

C. Project 2: Construct Detention Dam west of US Highway 81 on Park Creek Tributary on the northwest side of Madison. This detention pond would be created by extending the existing twin 54-inch culverts to the west of Highway 81 along with a berm over the culvert extension. The twin 54-inch culverts would terminate in a control weir structure. The control weir structure would have a 36" diameter low flow pipe to dewater the detention pond. The top of the concrete weir wall would be constructed approximately 1 to 2 feet below the Highway 81 grade such that a 100-year storm event

would be routed over the weir wall and through the twin 54-inch culverts before over-topping Highway 81.

The Opinion of Probable Project Cost for Project 2 is summarized as follows:

Construction Cost	$ 60,000
Contingencies	$ 8,000
Engineering & Administration	$ 12,000
Land Acquisition	$ 24,000
Opinion of Probable Total Project Cost	$104,000

D. Project 3: This project consists of upsizing or modifying the following structures:

Park Creek

- Fourth Street SE box culvert
- Railroad Bridge; vertical concrete wingwalls & abutments
- Garfield Avenue Bridge
- Grant Avenue Bridge
- Clean and Grade Stream channel to provide a more efficient channel.

Park Creek Tributary

- Josephine Avenue, construct one additional arch pipe

Silver Creek

- Washington Avenue box culvert
- Lower gravel road and replace box culverts just east of the dredged sludge holding ponds
- Clean and Grade Stream channel to provide a more efficient channel.

The Opinion of Probable Project Cost for Project 3 is summarized as follows:

Construction Cost	$1,371,000
Contingencies	$ 205,000
Engineering	$ 246,000
Administration	$ 14,000
Opinion of Probable Total Project Cost	$1,836,000

X. PROJECT FINANCING PLAN

The design and construction of the Madison / Lake County Flood Control and Erosion Control Projects will require a major investment of funds. The funding for these projects will require multiple financing mechanisms. In order to make the project(s) feasible, a combination of grants, loans and local cash reserves will be required. There are several local, state and federal agencies which may have funding for these types of projects. The following is a list of possible sources of funding:

1) Community Development Block Grant (CDBG)
2) Consolidated Water Facilities Construction Program (CWFCP)
3) Natural Resources Conservation Services (Formerly known as Soil Conservation Service - SCS)
4) U. S. Army Corps of Engineers
5) Rural Economic and Community Development, formerly known as Farmers Home Administration
6) EDA
7) EPA
8) FEMA
9) US Fish and Wildlife Service
10) SD Department of Game, Fish and Parks
11) Conservation District
12) Ducks Unlimited
13) Lake Associations
14) Bond Issue
15) Local (City and County)

The First District Association of Local Governments can assist the City of Madison and Lake County in securing grants and/or loans for the flood and erosion control projects. Banner Associates, Inc. has also assisted agencies in making application for various grants and/or loans.