II. HYDROLOGY

James River is a part of the Missouri River Basin and is in Hydrologic Region C. It originates in Wells County in central North Dakota and flows generally in an easterly direction until it turns south near the Grace City, ND. The James River has a large flood plain and the drainage area is composed of numerous noncontributing sloughs and small lakes.

There is approximately 649 square miles of contributing drainage area above this site, which was determined using U.S.G.S. topographic maps, County maps and gaging station data. The channel slope is approximately 3.2 feet per mile, which was derived from U.S.G.S. topographic maps.

A flood frequency analysis was completed for gaging station 06468250, which was then used in Equation (2) from the U.S.G.S. W-RI Report 92-4020 to determine the flood frequency discharge values shown in Table 1 below, see appendix 1 for calculations.

This roadway is located on an township road in Foster County; therefore the new culverts will be evaluated for a 15-year discharge frequency.

Table 1 - Design Frequencies

Frequency (Years)	Discharge (cfs)
2	937
10	3,175
15*	5,658
25	7,112
50	10,019
100	14,157
500	19,024

* Design Frequency

III. EXISTING CONDITIONS

The existing structure is a one span steel truss bridge supported on concrete abutments. This bridge was built in 1905 with no documented major reconstruction. The overall length is 50 feet with a clear roadway width of 17.7 feet. There is approximately 1" of dirt and gravel on the deck. The structure condition is considered in serious condition. The bridge is currently closed to traffic due to damage sustained from the 2009 spring flood event.