

In order to nearly eliminate downstream impacts, upstream staging and storage of approximately 200,000 acre-feet immediately upstream of the diversion channel inlet would be required. Figure 32 shows the area that would be affected during a 1-percent chance flood event. The Red River and Wild Rice River control structures would be operated to raise water surface elevations to a maximum of 922.8 feet at the diversion inlet for all events up to a 0.2-percent chance event. Storage Area 1 is a 4,360-acre area on the north side of the LPP diversion channel between the Wild Rice River and the Sheyenne River, and will be formed by nearly 12 miles of embankments. Storage Area 1, combined with staging in the floodplain, will nearly eliminate impacts from the project on flood levels downstream of the diversion channel outlet. The diversion works would be operated not only based on peak flows but primarily based on total hydrograph volumes, in particular those during the rising limb of the hydrograph. A tie-back levee along Cass County Road 17 (CR17) would be needed to keep staged water from crossing overland into the Sheyenne River. The levee would include construction of a ditch to capture local and overland flows. A portion of the CR17 tieback levee would be at an elevation lower than the other tie-back levees. This portion of the levee will act as an emergency spillway for extreme events that exceed the 0.2-percent chance event design capacity of the project.

3.13.1.2 Non-structural features

The non-structural mitigation measures recommended consist of fee acquisitions, construction of ring levees and the acquisition of flowage easements. These measures are recommended within the staging and storage areas as indicated in Figure 27 and Figure 39. The staging area is defined by the red boundary and the storage area is defined by the purple boundary shown in Figure 39; this area is needed for the operation of the project and a number of mitigation features are being recommended within this area. The proposed mitigation for the area is broken into two parts, one for homes, structures, and businesses and the other for agricultural lands. Impacted homes, structures, and businesses that have greater than 3 feet of flooding for the 1-percent chance event with the project in place would be purchased, those with 1 to 3 feet of flooding would be considered for ring levees or a purchase (a risk and safety analysis will be conducted for determination of viability of a ring levee), and those with less than 1 foot of flooding would have flowage easements purchased for the property. Farmsteads in the staging or storage area will be given additional consideration based on the depth of flooding, duration of flooding, and access. Acquisition of farmsteads will generally follow the mitigation plan listed above, however under some circumstances it may be viable to construct a ring levee or raise the farmstead. In any case, where farmsteads would have greater than 3 feet of flooding a buyout would be offered to the owner prior to consideration of other options. Impacts to agricultural lands in the staging area would be mitigated through the acquisition of flowage easements. A property-by-property analysis will be conducted to ensure that the specifics of each parcel are taken into account when determining the appropriate mitigation. Alternative mitigation options will be considered when application of the general rule does not result in adequate mitigation for a particular parcel.