



Division of Ecological & Water Resources
Region 4 (Southern Region)
21371 Highway 15 South
New Ulm, MN 56073

June 22, 2023

Nobles County Drainage Authority
960 Diagonal Road PO Box 187
Worthington, MN, 56178

Murray County Drainage Authority
2500 28th St. PO Box 57
Slayton, MN, 56172

Jackson County Drainage Authority
53053 780th St.
Jackson, MN, 56143

Subject: Preliminary Engineer's Report Improvement of Nobles/Murray/Jackson Judicial Ditch 17

Nobles, Murray and Jackson County Drainage Authorities,

Thank you for the opportunity to review the proposed Nobles/Murray/Jackson Judicial Ditch 17 (JD17) improvement project preliminary engineer's report (PER). The following comments are offered on behalf of the Commissioner of the Minnesota Department of Natural Resources (DNR) in accordance with Minnesota Statutes 103E.255.

Model Review

The below comments are based on information provided in the PER. When the ICM model is reviewed by DNR staff, additional comments will be provided to the engineer and the Nobles County Drainage Coordinator.

Comment 1

It is noted that runoff calculations in the model were performed using TR-55 method, and infiltration was estimated for the models based on the Green Ampt method for the existing soils. Infiltration is a part of the TR-55 runoff computation. If the model is using both Tr-55 runoff calculations and Green Ampt infiltration calculations, it is double counting infiltration, and the runoff depth to the system during the model simulation may be underestimated. Please explain.

Comment 2

The 8.5'x10' RCP arch culvert has been noted as being installed 1-ft above legal ditch grade, and that this could negatively impact tile systems ability to drain. Was lowering the culvert considered as part of the proposed design? Was the culvert modeled to be at ditch grade or at surveyed elevation for the existing conditions and proposed conditions model?

Comment 3

The curve number for all subcatchments was set to 75. Additional justification for using the same curve number for all subcatchments is recommended, as well as a map or shapefile that shows the subcatchments used in the modeling. For example, Dundee Township and Kinbrae Lake are two areas within the modeled watershed area that may require a higher curve number for those specific subcatchment areas based on their landcover.

Comment 4

Table 4 in Appendix F shows the JD17 System Outlet Peak Velocity Comparison. What location is this peak velocity taken from? All velocities in Table 4 for existing and proposed are higher than expected for a ditch system. For example, in MnDOT Drainage Manual Chapter 6, Section 6.2.2, the peak velocity where Class IV riprap is acceptable is 12ft/s. The results in Table 4 show this is exceeded for storm events greater than the 10-year event. Is there evidence of high velocity and scour at the location in existing conditions? Sheer stress calculations should be provided using FHWA Hydraulic Toolbox, or similar, to show that the location is properly protected from the velocity.

Comment 5

Provide peak velocity comparison at the main tile outlet, as well as the peak velocity at the new Branch B tile outlet. Sheer stress calculations should be provided at this location to show that the outlet protection at these locations is sufficient.

Environmental Considerations

On May 23, 2023, DNR staff conducted a site visit to assess current channel conditions. Minor erosion was observed between the tile outlet and Wigwam Avenue and significant erosion was observed between Wigwam Avenue and 440th St. The Branch B drainage coefficient increase from 0.17in/day to 0.52in/day and installation of a separate Branch B outlet has the potential to increase in-channel erosion through higher peak flows and baseflow. How will additional flow be mitigated to prevent increased erosion and ensure bank stability?

Increased flow volume also has the potential to negatively affect Talcot Wildlife Management Area (WMA). As noted in the PER rare features are located near the proposed project. Two Minnesota State species of special concern have been observed in close proximity to Talcot WMA, The Great Plains toad and Forester’s tern. Great Plains toads are sensitive to pesticide and herbicide use, and the loss and degradation of grassland habitats. Forester’s terns are vulnerable to water level fluctuation and their population has declined by 60% since 1964. The species would benefit from preservation and restoration of marsh habitats. Coordination with the WMA manager to preserve the ecological integrity of Talcot WMA is highly encouraged.

Des Moines River Watershed Comprehensive Watershed Management Plan (CWMP)

The CWMP was approved in March 2023. Bringing the proposed project into alignment with the CWMP is both feasible and prudent. JD17 is located in the Lime Creek – Upper Des Moines planning area and is identified as a high priority for sediment delivery, phosphorus loading, streambank erosion, and wildlife habitat. Talcot Lake is a high priority lake, and JD17 is identified as a high priority for the implementation of a more coordinated drainage management approach. The current iteration of the proposed project does not align with the CWMP due to the potential for increased erosion and impacts to Talcot WMA and Talcot Lake. To develop a project that reflects the priorities/goals of the CWMP robust measures to mitigate in-channel erosion and preserve the ecological integrity of Talcot WMA need to be integrated into the project design. The improvement process presents a unique

opportunity to address water quality and quantity concerns in the local community, and more broadly with the Des Moines River Watershed Partnership. Fortunately, it is early enough in the process to incorporate measures that will bring the watershed one step closer to achieving CWMP measurable goals.

Please send response, revised PER, meeting minutes, Finding of Fact, and any Order issued by the Drainage Authority regarding this proposed improvement to the DNR when they become available. Please submit these documents or any questions about this letter to the Regional Drainage email: Region4Drainage.dnr@state.mn.us

Regards,

Tom Kresko, Acting South District Manager

CC:

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