

## **Drainage Work Group Meeting Notes**

**September 10, 2015**

12:30 – 3:30 p.m.

Minnesota Farm Bureau Building, Eagan, MN

### **Attendance**

Jennifer Berquam, AMC; Greg Knopff, Senate Analyst; Ron Ringquist, MVA; Craig Austinson, Blue Earth Co.; Mark Morreim, MNLICA; Winston Beiser, Freeborn Co.; Larry Kuseske, MAWD; Alan Perish, MFU, MVA; Michelle Ulrich, CCWD; Kody Thurnau, MCEA; Mark Ten Eyck, MCEA; Kurt Deter, Rinke-Noonan; Dan Larson, MRCC; Todd Miller, MRCC; Rob Sip, MDA; Ray Bohn, MAWD; Ron Harnack, RRWMB; Jerome Deal, MAWD; Dan Wilkens, RRWMB; Chuck Fritz, IWI; Wayne Anderson, MPCA; Greg Eggers, MDNR; Mark Zabel, MASWCD; Andrea Henderson, MnDOT; Laura Nehl-Trueman, MnDOT; Al Kean, BWSR

### **Handouts prior to or during meeting**

1. DWG – Meeting Logistics and Agenda for 9-10-15
2. DWG – Meeting Notes for 8-13-15
3. BWSR FY16 CWF Multipurpose Drainage Management Grant Program RFP – Final Revised 9-3-15

### **Introductions and agenda overview**

All in attendance introduced themselves. Al Kean provided extra copies and an overview of the agenda, noting that the DWG Public Waters and Drainage Subgroup did not meet on 9-9-15 as planned, so that agenda item will be dropped. Jim Sehl, DNR, called off the meeting, because information that DNR is working on was not yet ready. No additions to the agenda were offered.

### **Approval of 8-13-15 meeting notes**

Extra copies of the meeting notes were distributed and corrections or additions requested. No corrections or additions were identified.

### **BWSR CWF Multipurpose Drainage Management Grant Program RFP – Revised 9-3-15**

Al K. noted that on 9-1-15 BWSR had an internal dry run of the program webinar conducted on 9-8-15 and had identified a few minor revisions that should be made to improve the RFP. Those revisions were made via strikethrough and addition of text in red and the RFP republished on 9-3-15. The revised version is on the BWSR website. A concern was expressed regarding the maximum payment rate for storage and treatment wetland restoration easements being limited to the RIM rates, because this could prevent a watershed district or other LGU from paying more to acquire an easement on a high priority site. Al K. noted that the RIM rates are well known and reviewed annually, and the state CWF grant is up to 75%. He also indicated that this concern and the RFP could be reevaluated for the FY17 Multipurpose Drainage Management Program.

### **Otter Tail County GIS assistance for drainage system viewing data**

George Meyer, GIS Lead Developer for Otter Tail County, provided a presentation and answered questions about GIS information developed by the county and used by viewers to substantially streamline viewers' time in the field for redetermination of benefits and damages for Chapter 103E drainage systems. The county plans to systematically redetermine all of the drainage systems it administers. ArcGIS is the key software used for this work. Key data layers utilized by the county GIS staff include county digital parcel data, aerial photography, LiDAR digital elevation models (DEMs), catchment boundaries, USDA digital soils data and hydrologic soil group categories (A, B, C, D; generally

less to more runoff), National Land Cover Database, and ditch alignments digitized by county GIS staff. Drainage benefit classes (A, B, C, D; generally more to less benefit) typically are about opposite of hydrologic soil groups. It was noted that soils maps are not always accurate at the field scale. Tile drainage systems can be difficult to locate when historic records are lacking. The GIS products are put in a field notebook for viewers to verify or revise based on review and field work and are used by the viewers to help define drainage system benefits. Discussions included questions about the methods used by GIS staff and how well this approach is working. George indicated that the approach is working pretty well and experience has led to faster work by GIS staff and viewers.

### **Terrain Analysis and applications, and potential for runoff-based drainage assessment**

Chuck Fritz, Director, International Water Institute (IWI), provided a presentation about various GIS and terrain analysis methods and tools that have been developed by and in cooperation with the Red River Basin IWI, the Red River Watershed Management Board, and Houston Engineering, Inc. The basis for these methods and tools is the LiDAR-derived digital elevation models (DEMs) and ArcGIS software. The Red River Basin led the way in acquiring LiDAR data statewide in Minnesota. Raster-based GIS methods use 3- or 5-meter cells derived from the DEMs. Most terrain analysis requires “hydrologic conditioning” of the LiDAR data to “burn” flow paths through roads and other “digital dams” in the DEMs to accurately reflect how water moves across the earth’s surface. There is a need for a statewide standard for hydro-conditioning. Culvert and bridge inventories are not necessary for hydro-conditioning and approximate hydrologic analyses, but are used for more detailed hydraulic analyses. Other digital data layers used include USDA digital soils data and hydrologic soil group categories, National Land Cover Database, and USGS regression equations for estimating peak flows by frequency on small streams and rivers in North Dakota and Minnesota.

Intermediate products include flow direction grids and flow accumulation grids, stream and ditch networks, runoff curve number for individual cells, and curve number grids. Other products/outputs that can be done include catchment/drainage area at any point on the derived flow path networks, estimated peak flows by frequency for catchments, time of concentration for catchments, depression analysis, Stream Power Index analyses, and drained wetland basin analyses. It was noted and discussed that the hydrologic analyses are not to a level of detail that directly models the effects of culverts and bridges at road crossings.

Chuck provided a brief overview of the Prioritized, Targeted and Measurable Application (PTMApp), which has been developed based on terrain analysis methods to help prioritize subwatersheds for water quality practices, target practice locations within a watershed at the field scale, and measure relative and cumulative effects on water quality improvements. Several example applications in the Root River watershed were presented.

There was discussion during the presentation about how these methods and tools might be used to help develop an option for runoff contribution based assessment of drainage system costs and benefits for redetermination of benefits and damages. It was noted early in the presentation and further discussed near the end that defining relative runoff contributions at the field scale with terrain analysis methods is quite workable, while economic benefit analysis is more challenging. The effect of pattern tile on surface and subsurface runoff contributions is another consideration that was briefly discussed.

### **Next Meeting**

Thursday, October 8, 2015, 12:30 – 3:30 p.m. at the Association of Minnesota Counties building in St. Paul, MN.