

WSF 2017 Annual Report # 4126

PROJECT: *P-MRNRD Platte and Elkhorn River Valley Integrated Water Monitoring*–WSF Application #4126 (awarded April 2016)

DATE: APRIL 1, 2018
(FIRST ANNUAL REPORT DUE ON OR BEFORE APRIL 1, 2017)

See Application 4126 Section D #2 For Project Scope Summary and Timeline

PROJECT PROGRESS APRIL 2016 TO APRIL 2018:

- The P-MRNRD Platte and Elkhorn River Valley Integrated Monitoring Project is an active research study being conducted by USGS. The project consists of continuous groundwater level monitoring along an approximate cross section shown in the attached Figure 1 between the Platte River streamflow gage near Leshara and the Elkhorn River streamflow gage near Waterloo. Prior to the end of June 2016, USGS deployed and installed continuous groundwater level recorders and transmitters in four groundwater wells along this cross section. An existing groundwater level recorder was already active near the Waterloo streamflow gage. These five well sites have been recording real-time data since the beginning of July 2016 on USGS website ([LPNMRD-80](#), [Leshara](#), [MUD-15](#), [Valley-15](#), and [Waterloo](#)). Additionally, a synoptic water level survey was conducted for the entire study area, also shown in Figure 1, at the beginning of November 2016 to create a 5 foot groundwater level contour map. At the same time, field streamflow measurements were taken at approximately 10 tributary locations or locations within the Elkhorn River. A second synoptic water level survey was conducted for the study area during August of 2017 and similar streamflow measurements were recorded. Data collection for a streambed and bank conductance study occurred at two sites in the Elkhorn River during the summer of 2017.

ANTICIPATED ACTIVITIES FROM NOW UNTIL NEXT ANNUAL REPORT DUE APRIL 1, 2019:

- The P-MRNRD will continue to work with USGS over the next year on this study. Real-time data will continue to be collected during this time. Data collected for the streambed and bank conductance study in the Elkhorn River will be processed and analyzed. A complete report will be drafted and undergo USGS's rigorous QA/QC process. The final report should be delivered by the end of 2018.

ANTICIPATED CASH FLOW FOR REMAINDER OF THE PROJECT:

- The P-MRNRD has a Joint Funding Agreement with USGS for a total amount of \$253,500 of which the P-MRNRD would pay \$175,500 to USGS. P-MRNRD has paid USGS \$141,250 as of the end of 2017 and expects to expend the remaining \$34,250 by the end of May 2017. The P-MRNRD submitted one Claim, before June 1, 2017, for the amount of \$31,950 and will be requesting a second claim prior to June 1, 2018.

LIKELIHOOD THAT BENEFITS PROJECTED IN APPLICATION 4126 WILL BE REALIZED:

- Based on an evaluation of the results from USGS's preliminary analysis through 2017, the project is on target for achieving the benefits as described in the application. Initial findings are already showing that the Platte River is a losing reach to the alluvial aquifer along Douglas County and the groundwater contours decline from west to east toward the Elkhorn River. Groundwater levels recorded right next to the streamflow gages show that elevations in the Platte River are almost constantly greater than the groundwater level at Leshara signifying water moving from the river into the aquifer. While the groundwater level and gage at Waterloo are nearly constantly the opposite with the groundwater elevation higher than that of the river even during most high water events. The one time streamflow measurements show a fairly dramatic increase in streamflow in the Elkhorn River. For example, the stretch between Waterloo and Q Street in Douglas County has no apparent surface water tributary flows, but in early November had nearly 100 cfs more streamflow at the downstream location. It is anticipated that conclusions from the streambed and bank conductance analysis will help quantify seepage rates into the Elkhorn River at two different aquifer thickness locations.