



March 30, 2017

Mr. Kent Zimmerman
kent.zimmerman@nebraska.gov
Nebraska Department of Natural Resources
301 Centennial Mall South
P.O. Box 94676
Lincoln, Nebraska 68509-4676

Re: **WSF 2017 Annual Report # 4126**

Dear Mr. Zimmerman,

Please find enclosed the FINAL Status Report for the Papio-Missouri River Natural Resources District (P-MRNRD) *Platte and Elkhorn River Valley Integrated Water Monitoring* project under WSF Grant Contract #4126 between the Nebraska Department of Natural Resources (NDNR) and the P-MRNRD.

Please contact me if you have any questions or comments.

Sincerely,

Paul W. Woodward, PE, CFM
Groundwater Management Engineer

Enclosures (1)

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, 2017
(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 2017:

- 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 ([LPNNRD-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.

ANTICIPATED ACTIVITIES FROM NOW UNTIL NEXT ANNUAL REPORT DUE APRIL 1, 2018:

- The P-MRNRD will continue to work with USGS over the next two years on this study. Real-time data will continue to be collected during this time and a second synoptic groundwater level survey and streamflow measurements will be completed in Spring 2017. Another activity planned during the study is to conduct streambed and bank conductance monitoring in the Elkhorn River during the fall to freeze-up period of 2017 in which permeameter measurements and variances in groundwater temperature will determine the hydraulic conductivity.

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 \$80,250 as of the end of 2016 and expects to expend an additional \$26,750 by the end of May 2017. The P-MRNRD intends to submit one Claim, on or before June 1, 2017, and will be requesting the entire grant amount of **\$64,200 from WSF (60% of \$107,250 paid by June 1, 2017, closing out WSF#4126).**

LIKELIHOOD THAT BENEFITS PROJECTED IN APPLICATION 4126 WILL BE REALIZED:

- Based on an evaluation of the results from USGS's preliminary analysis through 2016, 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 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.