

LOWER PLATTE NORTH NATURAL RESOURCES DISTRICT

NEBRASKA WATER SUSTAINABILITY FUND GRANT AWARD ANNUAL REPORT – APRIL 1, 2020 APPLICATION NO. 5201

Build Detention Sites 26a, 26b & 27 within the Wahoo Creek Basin - Project Summary

The Water Sustainability Fund (WSF) grant agreement for the Lower Platte North NRD (LPNNRD) awarded \$2,269,194 for the planning, design and construction of Wahoo Creek detention sites 26 & 27 beginning November 28, 2017. LPNNRD acquired an additional \$1.5 million of federal assistance through the Natural Resources Conservation Service (NRCS) Resource Conservation Partnership Program (RCPP). Total project costs are estimated at \$5.3 million and will include grant dollars from WSF and RCPP with \$1.5 million in local funding.

Sites 26 and 27 were identified in the *Plan/EIS* to provide regional detention of storm water and water quality benefits. The *Plan/EIS* was last updated in 1998 by LPNNRD and NRCS under the authority of the Watershed Protection and Flood Prevention Act (Public Law 83-566). The watershed plan identified seventeen floodwater retention structures within the basin to reduce rural and urban flooding, reduce sedimentation and scour, stabilize stream channels, enhance fish and wildlife habitat, enhance water quality, improve economic conditions, and provide recreational opportunities.

PROJECT PROGRESS APRIL 2, 2019 THROUGH MARCH 31ST 2020:

In the year since the last report LPNNRD hired Olsson Engineering to do Geotechnical, Final Design, and oversee construction of dam sites 26a, 26b, and 27. Olsson has been diligently working on finishing the geotechnical investigation of the three sites. They are unable to work on design for the sites until the Watershed Plan is approved by NRCS. LPNNRD hoped to have the plan submitted and approved prior to January 2020, but the plan ran into an unforeseen complication. The NRCS regional office in Little Rock Arkansas questioned the economics of the plan. After much back and forth with the team at FYRA Engineering (Lead firm in plan development) the economics were accepted, and the plan was submitted for approval in January 2020. LPNNRD hopes to have the plan reviewed and accepted by June 2020 but has learned not to take anything for granted when there are multiple levels of federal oversight to get through. Once the plan is accepted Olsson is ready to move forward with the final design of the three structures. A breakdown of reports from Olsson follows:

April 2019: billings this month are for geotechnical investigation

May 2019: billings this month are for geotechnical investigation. Perform standard proctor and triaxial tests

June 2019: We are finished with all the low end testing for the dams that include densities, moistures, gradations, falling head perms, consols, unconfined compression tests and unconsolidated undrained compression tests. We have just a couple high end tests that include remolded triaxial compression tests, flex wall permeability tests, and some final pinhole dispersion tests. We will be ready to work on settlement estimates, seepage and slope stability analysis once we get confirmation on each of the dams final alignment and anticipated footprint. At this time, the only concern I am seeing is there is potentially dispersive soils at each of the project sites. The Peoria loess has been showing crumbs of 4 which may not be suitable for use in critical areas or on the shell of the dam without additional treatment. We are finalizing those determinations right now.

July 2019: follow up round of lab testing including pinholes, flexwall perms and triaxial tests

August 2019: Geotechnical has been working on fine-tuning the soil profiles for each of the dams and working on settlement calculations. Initial calculations are showing some possible excessive differential settlement at site #27 but these are initial calculations and Geotechnical is referencing the input values that go in the calculations

to those found at #26A and 26B. We have also been working on updating the boring logs for the appendix for each dam.

September 2019: We have completed our initial settlement calculations for dam #27. Due to potential differential cracking in the embankment near the existing channel, we will likely recommend the embankment be constructed in 2 stages. The location of the principal spillway will also need to consider the potential for cracking near the existing channel and will need to be set far enough away that cracks will not occur around the pipe. We have also finalized the soil profiles and properties to use during analysis for dams 26A and 26B. Within the next 2 weeks we will estimate the settlement at these dams.

October 2019: Geotechnical work continues

November 2019: We spent a majority of the time reviewing the costs to delay or split the next 8 dams and attend a meeting. In addition, we performed a consolidation test on a sample of colluvium and updated the settlement calculations to reflect the lab testings.

December 2019: Currently, we have been working on the geotechnical analysis which includes settlement, seepage, and slope stability, for dams 26A, 26B, and 27. Estimating the settlement for 26A has been our recent priority.

January 2020: We have continued to work on seepage and settlement analysis of the 3 dams. Once seepage is complete, we will transition the models we have created into slope stability.

February 2020: We have continued to progress through analysis for dams 26A and 26B and finalized most of the appendices for all 3 dams. Each dam has differential settlement issues and will need 2 stage construction. The principal spillways will need to be located outside of the staged construction zones to prevent cracks extending around the pipes. We have also been looking at seepage and uplift in the principal spillway plunge pools

March 2020: No update received from Engineer as invoices for previous month generally come in the middle of the next month.

ANTICIPATED ACTIVITIES FROM NOW UNTIL NEXT ANNUAL REPORT DUE APRIL 1, 2021:

The watershed plan should be accepted by NRCS in the next two months. Once the plan is accepted, Olsson will finish Geotechnical work on the three dams and begin the final design for each. It is hoped that design is completed and construction well underway by the time the next report is due in 2021. LPNNRD is currently seeking Federal Assistance with Dams 77 and 84 as identified in the plan. If federal funding is made available LPNNRD plans to apply for WSF and NET funding to help get these dams constructed and bring enhanced flood damage reduction to the watershed.