

Memorandum

To: Papio-Missouri River Natural Resources District Programs Projects and Operations Subcommittee
From: Paul W. Woodward, PE, Groundwater Management Engineer
Date: May 1, 2017
Re: Review and Recommendation on the ENWRA Interlocal Agreement Amendment #5 and Cooperative Agreement with UNL-CSD for completing geologic testholes in the Missouri River valley

The District has been a partner of the Eastern Nebraska Water Resources Assessment (ENWRA) project for 10 years. During this time, the original Interlocal Agreement has been amended four different times to either better define the scope of work undertaken by ENWRA and its coordinator or extend the project timeframe. The annual contribution required from the P-MRNRD has never been increased as part of these amendments and remains \$30,000. The proposed Amendment #5 is no different in that it only extends the term of the agreement and workings of ENWRA from June 30, 2017 to June 30, 2022.

Staff recommends that the subcommittee recommend to the Board of Directors that the General Manager be authorized to execute Amendment #5 to the Eastern Nebraska Water Resources Assessment Interlocal Cooperative Agreement with five other Natural Resources Districts to extend the term of the Agreement to 2022, subject to changes deemed necessary by the General Manager and approval as to form by District Legal Counsel.

The ENWRA long-range plan identifies future objectives and projects to be collectively completed through ENWRA in each of the NRDs. One such project area in the P-MRNRD is to map the upper alluvial and tributary aquifers between the uplands and the Missouri River. In order to complete this task using AEM survey methods in 2019 or 2020, there must be enough existing geologic testhole information to interpret the resistivity measurements and literally "ground truth" the results. After doing some research, there are currently no UNL-CSD geologic testholes within the Missouri River valley between Blair and Jackson, NE. This was discussed with Katie Cameron, ENWRA Coordinator, and UNL-CSD drillers and they have prepared a work plan and Cooperative Agreement with the P-MRNRD to drill and log the testholes, see attached.

Eighteen new testholes are being proposed as shown on attached Figure 1. The labor cost for the licensed geologist is covered via ENWRA dues as Katie Cameron will be completing the logs. The total drilling depth for all the holes is 4,000 feet and CSD is able to provide all the equipment, drill crew labor and travel costs for approximately \$19.50 per foot. The work would be completed over a 3 fiscal year period for a total cost to the P-MRNRD of \$78,100.

Also, based on ENWRA budgets over the coming fiscal years, there may be funding to support each NRD with one or two testholes in each District. It is anticipated that this might be able to reimburse the P-MRNRD up to \$9,000 over the three year period.

Staff recommends that the subcommittee recommend to the Board of Directors that the General Manager be authorized to execute a Cooperative Agreement with the University of Nebraska Lincoln Conservation and Survey Division to complete geologic testholes in the Missouri River valley for a cost to the District not to exceed \$78,100, subject to changes deemed necessary by the General Manager and approval as to form by District Legal Counsel.

INTERLOCAL COOPERATIVE AGREEMENT

BETWEEN THE

**LEWIS & CLARK NATURAL RESOURCES DISTRICT
LOWER ELKHORN NATURAL RESOURCES DISTRICT
LOWER PLATTE NORTH NATURAL RESOURCES DISTRICT
LOWER PLATTE SOUTH NATURAL RESOURCES DISTRICT
NEMAHA NATURAL RESOURCES DISTRICT and
PAPIO-MISSOURI RIVER NATURAL RESOURCES DISTRICT**

AMENDMENT #5

THIS AMENDMENT #5 is made and entered into by and between the above natural resources districts this ____ day of _____, 2017. The natural resources districts are hereinafter referred to collectively as the Districts. This Amendment supplements the original agreement effective as of January 18, 2007, and Amendments #1, #2, #3 and #4 effective as of December 10, 2012.

Modification #1: Article III, Section 3.02, original agreement, as modified in Amendment #1,

Modification #1 and Amendment #4, Modification #1:

The “Exhibit A” Cooperative Agreement references related to the coordinator position shall refer to the updated Cooperative Agreement for the July 1, 2017 - June 30, 2020 term, attached hereto.

Modification #2: Article V, Section 5.02-5.03, original agreement, as modified in Amendment #1,

Modification #3 and Amendment #3, Modification #2:

These sections shall be changed to read:

The Districts shall contribute funding for the project for the entire term of the agreement which now terminates on June 30, 2022, unless further extended by mutual agreement of all Districts. The Districts agree that finding for the FY 2018 through FY 2022 will be as follows:

	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
LCNRD	\$7,000	\$7,000	\$7,000	\$7,000	\$7,000
NNRD	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000
PMRNRD	\$30,000	\$30,000	\$30,000	\$30,000	\$30,000
LENRD	\$30,000	\$30,000	\$30,000	\$30,000	\$30,000
LPSNRD	\$30,000	\$30,000	\$30,000	\$30,000	\$30,000
LPNNRD	\$30,000	\$30,000	\$30,000	\$30,000	\$30,000
Total	\$147,000	\$147,000	\$147,000	\$147,000	\$147,000

LEWIS AND CLARK NATURAL RESOURCES DISTRICT

BY: _____

DATE: _____

LOWER ELKHORN NATURAL RESOURCES DISTRICT

BY: _____

DATE: _____

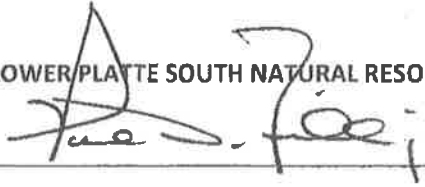
LOWER PLATTE NORTH NATURAL RESOURCES DISTRICT

BY: _____

DATE: _____

LOWER PLATTE SOUTH NATURAL RESOURCES DISTRICT

BY:



DATE: APRIL 19, 2017

NEMAHA NATURAL RESOURCES DISTRICT

BY: _____

DATE: _____

PAPIO-MISSOURI RIVER NATURAL RESOURCES DISTRICT

BY: _____

DATE: _____

COOPERATIVE AGREEMENT
between the
PAPIO-MISSOURI RIVER NATURAL RESOURCES DISTRICT
and
THE BOARD OF REGENTS OF THE UNIVERSITY OF NEBRASKA ON BEHALF OF
THE UNIVERSITY OF NEBRASKA-LINCOLN THROUGH ITS
CONSERVATION AND SURVEY DIVISION,
SCHOOL OF NATURAL RESOURCES

THIS AGREEMENT, is entered into the _____ day of _____, 2017, by the Papio-Missouri River Natural Resources District (hereinafter referred to as the P-MRNRD) and the Conservation and Survey Division, School of Natural Resources of the University of Nebraska-Lincoln (hereinafter referred to as the CSD).

The P-MRNRD and the CSD, in accord with their ongoing program responsibilities, desire to participate in a CSD test-hole drilling and monitoring well installation program to (1) Provide test-hole drilling equipment, supplies and expertise for obtaining subsurface geologic and hydrogeologic information within the P-MRNRD boundaries; (2) Provide bore-hole geophysical logging equipment, supplies and expertise for obtaining measurements of physical, chemical and electrical properties within test-holes drilled at each site; (3) Provide well designs and administration services of the contract associated with the installation of monitoring wells (if applicable); and (4) Provide on-site training for P-MRNRD staff during the well construction phase (if applicable).

THEREFORE, IT IS MUTUALLY AGREED THAT:

- (1) **COOPERATION:** The P-MRNRD and the CSD desire to cooperate and collaborate to accomplish the study objectives mutually agreed upon.
- (2) **PERIOD:** This agreement shall begin upon approval by P-MRNRD and will continue for a period of three (3) years.
- (3) **STATEMENT OF WORK:** Certain portions of the study require a significant level of technical expertise and interpretation from the CSD. These include elements as listed in the attached proposal, herein referred to as Attachment #1.
- (4) **P-MRNRD CONTRIBUTIONS:** As hereinafter limited, the P-MRNRD shall contribute such of its funds, facilities, equipment, materials and personnel as it deems suitable and appropriate to accomplish the objectives of the study. The P-MRNRD shall provide funds to the CSD to support costs directly related to test-hole drilling and geophysical logging expenditures. The three year costs include CSD logging services for 15 to 20 test-hole/monitoring well locations and will not exceed the amount of seventy eight thousand one hundred dollars (\$78,100). A breakdown of estimated costs is included in Attachment #1.
- (5) **CSD CONTRIBUTION:** The CSD shall utilize funds provided by the P-MRNRD and such of its own funds for facilities, equipment, materials and personnel as it deems suitable to conduct the investigation and analysis called for in this Agreement. Hydrogeological

expertise will be contributed to the project for sampling, logging, and well designs.

- (6) **PRINCIPAL INVESTIVATORS:** Matt Marxsen, lead driller of CSD shall be the principal investigator for the project (50%). Kathleen Cameron, Eastern Nebraska Water Resources Assessment (ENWRA) Coordinator/CSD Hydrogeologist and Susan Lackey CSD Hydrogeologist will be the co-principal investigators for the project (25% each).
- (7) **PUBLICATION:** Both parties shall have the right to announce and publish the results, facts, or conclusions of cooperative work under the terms of the Agreement, provided such announcement or publication shall expressly recognize the cooperation of the other party and provided such publication shall not indicate approval of the results, facts or conclusions by the other party. It is recognized that the CSD is obligated to maintain public access to data obtained in this study.
- (8) **LIABILITY:** Each party agrees that it will be responsible for its own acts and the results thereof and shall not be responsible for the acts of the other parties and the results thereof. Each party therefore agrees that it will assume all risk and liability to itself, its agents or employees, for any injury to persons or property resulting in any manner from the conduct of its own operations, and the operations of its agents or employees, under this Agreement, and for any loss, cost, damage, or expense resulting at any time from any and all causes due to any act or acts, negligence, or the failure to exercise proper precaution of or by itself or its own agents or its own employees while occupying or visiting the premises under and pursuant to this Agreement.
- (9) Attachment #1 is hereby incorporated in and made a part of this Agreement the same as if it had been specified herein verbatim.

PAPIO-MISSOURI RIVER
NATURAL RESOURCES DISTRICT

By _____

Date _____

CONSERVATION & SURVEY DIVISION
OF THE UNIVERSITY OF NEBRASKA

By _____

Date _____

THE BOARD OF REGENTS OF THE
UNIVERSITY OF NEBRASKA, UNL

By _____

Date _____

ATTACHMENT #1

Test-hole Drilling, Sampling, and Logging Program for the Papio-Missouri River Natural Resources District

The Papio-Missouri River Natural Resources District (P-MRNRD) has a complex assemblage of aquifers which supply most of the water used for irrigation and drinking. The P-MRNRD has future plans to drill test-holes, record down-hole data, and construct monitoring wells to establish baseline information about groundwater quality, quantity, and aquifer composition.

Conservation and Survey Division (CSD) scientists will perform preliminary hydrogeologic analyses to determine the most appropriate drilling sites. These will be reviewed with the P-MRNRD staff that will be responsible for obtaining landowner permission for site access for test-hole drilling and monitoring well installation (if applicable).

CSD will drill or will hire a licensed water well contractor to drill the test-holes. The P-MRNRD will provide staff on-site during drilling to interact with the public and assist the geologist as needed. At the time of drilling, samples will be collected by CSD geologists to adequately represent the types of material encountered during the drilling operation. These samples will be described both in the field and in the laboratory to determine the lithologic composition and stratigraphic nomenclature of the test-hole. Once the interpretation phase is complete, the samples will be placed in CSD's test-hole repository future use and the information obtained will be entered into the statewide test-hole database maintained by the CSD.

At the completion of drilling operation for each test-hole, a geophysical log suite will be obtained using CSD's equipment and personnel. Measurements will include natural gamma, single-point resistance, spontaneous potential, 16- and 64-inch normal resistivity, lateral resistivity, fluid resistivity and fluid temperature. The geophysical log suite will aid in the interpretation of lithology and, in some instances, provide information on hydraulic properties of various units encountered within the test-hole. CSD scientists will utilize the test-hole logs to design the monitoring wells and define pumping and water level monitoring equipment specifications (if applicable). An additional CSD contribution to the project will be assisting the P-MRNRD to obtain accurate well completion logs for each monitoring well.

Budget

Year	Budget Category	Estimated Quantity	Cost
One (FY18) South Group	Equipment (Test-hole Drilling and Geophysical Logging)	800 feet	\$6,200.00
	Labor (Drill Crew)		\$3,200.00
	Expenses (Crew and Geologists Travel)		\$4,800.00
	10% F&A (Office of Sponsored Programs)		\$1,420.00
	Subtotal		\$15,620.00

Year	Budget Category	Estimated Quantity	Cost
Two (FY19) Central Group	Equipment (Test-hole Drilling and Geophysical Logging)	1,600 feet	\$12,400.00
	Labor (Drill Crew)		\$6,400.00
	Expenses (Crew and Geologists Travel)		\$9,600.00
	10% F&A (Office of Sponsored Programs)		\$2,840.00
	Subtotal		\$31,240.00

Year	Budget Category	Estimated Quantity	Cost
Three (FY20) North Group	Equipment (Test-hole Drilling and Geophysical Logging)	1,600 feet	\$12,400.00
	Labor (Drill Crew)		\$6,400.00
	Expenses (Crew and Geologists Travel)		\$9,600.00
	10% F&A (Office of Sponsored Programs)		\$2,840.00
	Subtotal		\$31,240.00

Note: CSD equipment, crew labor and personnel travel costs will be invoiced according to the actual quantities accomplished at current CSD rates (estimated around \$19.50/foot on these Dakota Missouri-River bottom holes with the F&A). **Invoice amounts will not exceed \$78,100.**

