

Memorandum

To: Papio-Missouri River Natural Resources District Programs Projects and Operations Subcommittee
From: Paul W. Woodward, PE, Groundwater Management Engineer
Date: January 31, 2022
Re: Review and Recommendation on Groundwater Monitoring Joint Funding Agreement with USGS

Since 1992, the District has implemented a groundwater quality monitoring program as a requirement of the NRD's Groundwater Management Plan through a joint funding agreement with the US Geological Survey (USGS). The previous joint funding agreement expires on March 31, 2022. The monitoring program samples and analyzes the groundwater of the four aquifer systems within the District: the Missouri River alluvium, the Platte and Elkhorn River alluvium, the Dakota Aquifer, and the Upland alluvial aquifer, on an annual rotation. This means only approximately 20 samples were collected from each of the aquifer systems once during each 4-year cycle.

Both private wells (Network Wells) and dedicated monitor sites are sampled. The District has installed and maintains clusters of dedicated monitoring wells with 2 or 3 wells screened at various depths in multiple locations across the District, see Figure 1. The current dedicated monitoring wells include 44 wells at 16 different sites. 12 of these cluster sites are within community wellhead protection areas. In order to meet NDEE recommendations for groundwater quality monitoring, the 16 monitoring well cluster sites need to be sampled at least once every other year.

This also helps meet the recommendations presented in the 2018 Groundwater Management Plan to increase monitoring in groundwater quality areas of concern. These areas of concern include the Platte River alluvium south of Springfield, the Dakota sandstone aquifers between Springfield and Gretna, Tekamah's wellhead protection area, and the Platte River alluvium in western Douglas and Sarpy Counties. In order to determine if certain areas may become Phase II Groundwater Quality Management Areas, over 50% of the samples taken within the same groundwater reservoir must exceed 50% of the maximum contaminant level for a minimum of 3 consecutive sampling events. For this reason, the attached USGS sampling plan schedule and cost summary increases monitoring and testing from 20 to 30 sample sites each year.

The existing agreement covered four years of monitoring from 2018 through 2021 for a total cost of \$691,500. The proposed Joint Funding Agreement splits P-MRNRD payments to USGS out over five fiscal years (FY 22 - FY 26) and covers monitoring during 2022 – 2025. Per the enclosed Joint Funding Agreement, the maximum cost to the District is \$622,500 and USGS is providing a higher percentage of cooperative funding, see table below:

Program	District	USGS	Total
Previous Agreement	\$582,800 (84.3%)	\$108,700 (15.7%)	\$691,500
Proposed Agreement	\$622,500 (80.3%)	\$152,400 (19.7%)	\$774,900

Management recommends that the Subcommittee recommend to the Board that the General Manager be authorized to execute the Joint Funding Agreement with USGS for the 2022-2026 Groundwater Quality Monitoring with a not to exceed amount of \$622,500, subject to changes deemed necessary by the General Manager and approval as to form by District Legal Counsel.

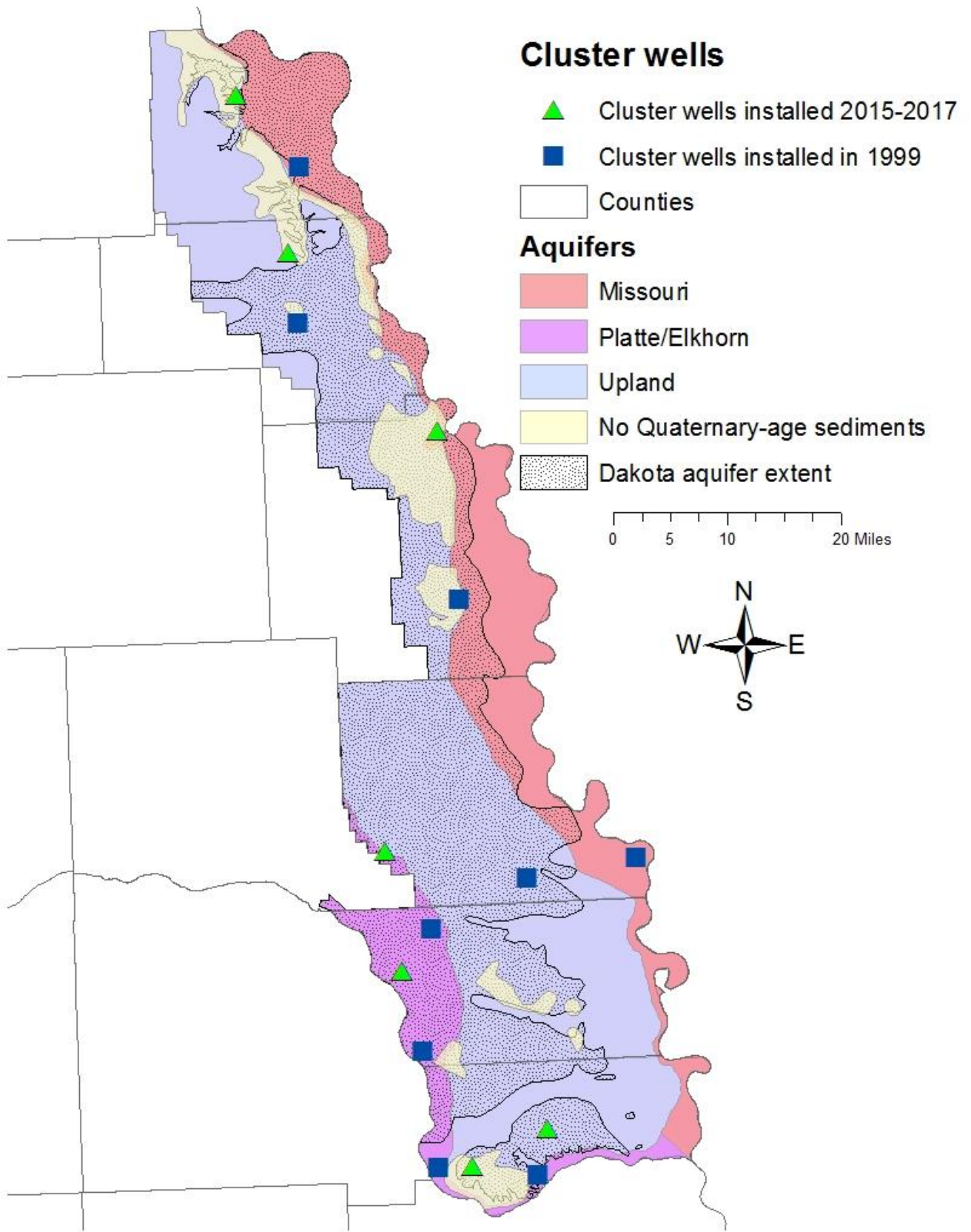


Figure 1. Location of P-MRNRD owned dedicated monitoring wells to be used as biannual network monitoring wells for NDEQ. View [Nebraska Groundwater Quality Clearinghouse](#)

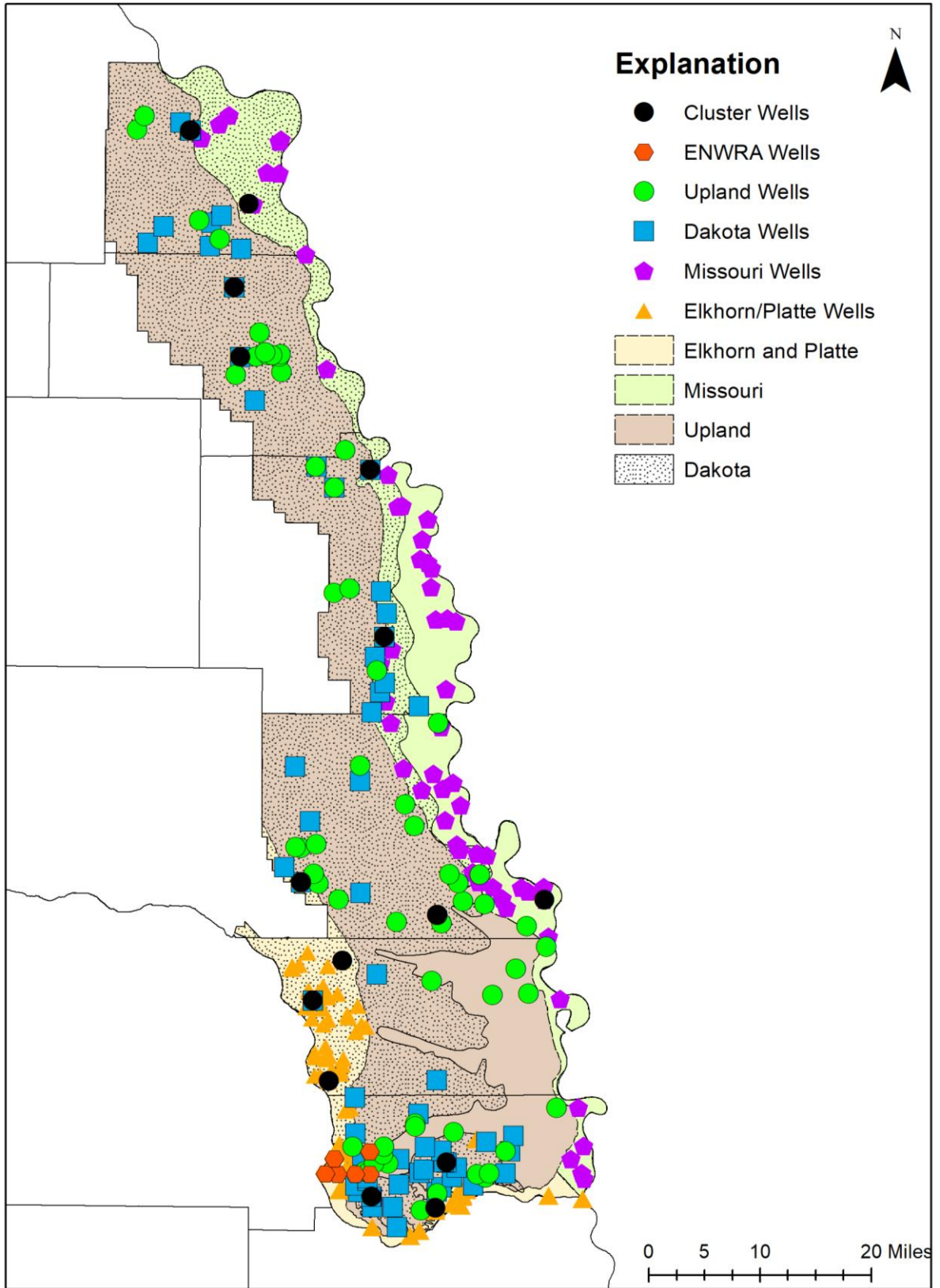


Figure 2. Previously sampled wells within the Pappo-Missouri River Natural Resources District since 1992.

Groundwater quality monitoring for the Papio-Missouri River Natural Resources District, Eastern Nebraska, 2022-2025

Mikaela Cherry, Brent Hall, Cory Kavan and Justin Krahulik, USGS NEWSC

Introduction

The U.S. Geological Survey (USGS) Nebraska Water Science Center (NEWSC), in cooperation with the Papio-Missouri River Natural Resources District (PMRNRD), has been monitoring groundwater in the PMRNRD from 1992 (Verstraeten and Ellis, 1994) to the present. The PMRNRD, in Eastern Nebraska, covers approximately 1.1 million acres and has a population of approximately 825,000 residents (fig. 1). The demand for groundwater has increased with the growing population. To meet current and future demands, municipalities are seeking to utilize all available sources of groundwater, and commercial and domestic use of the groundwater supplies are increasing.

The PMRNRD must collect groundwater quality samples to satisfy legislative or cooperative agreements with three other entities. Most of the sampling focuses on geochemical and agrichemical data collection, as a majority of the land within the district is used for agricultural purposes. However, the District also contains the plurality of the state's residents and the largest urban area of Nebraska.

The PMRNRD is tasked with protecting the natural resources within their district for the beneficial uses of the residents. The PMRNRD manages groundwater resources through their Groundwater Management Plan (GWMP) (PMRNRD, 2018). Recent USGS studies (Verstraeten and Ellis, 1995, Verstraeten and Ellis, 1999, McGuire and others, 2012) have supported the GWMP and subsequent update (Papio-Missouri River Natural Resources District, 2018). Results from these studies helped PMRNRD staff define Water Quality Phase II areas, which are areas where fertilizer application is reported because of nitrate contamination found in the groundwater (PMRNRD, 2018).

Verstraeten and Ellis (1999) identified five primary aquifers within the PMRNRD—the Elkhorn River alluvial, Missouri River alluvial, Platte River alluvial, Upland alluvial and the Dakota sandstone. All these aquifers, except the Dakota, are the surficial aquifers in the respective area (Verstraeten and Ellis, 1995). In the development of the new GWMP (PMRNRD, 2018), the Platte River alluvial and Elkhorn River alluvial have been labeled as a single aquifer, the Platte/Elkhorn alluvial aquifer (fig. 1). The alluvial aquifer systems are the primary sources of water within the district, especially with regards to municipal water supplies. Bedrock aquifers, such as Dakota Sandstone, are being utilized for domestic and agriculture use but are starting to be considered by municipalities to supplement residential, commercial, and industrial water use. The PMRNRD has installed additional monitoring wells in the bedrock aquifers to determine the suitability for expanded use of the resources.

Problem

The PMRNRD updated their GWMP to continue to focus on groundwater sampling to monitor agrichemical trends. The updated GWMP has identified two areas where groundwater quality is poor

and landowners are implementing new management techniques. Increasing monitoring in these identified areas and across the district will allow managers to respond quicker to changes in the water quality. Increased monitoring will improve the understanding on how the new management techniques are improving the groundwater quality. The PMRNRD also wants to better understand what other contaminants are in the groundwater system besides agrichemicals.

In addition to complying with their GWMP, the PMRNRD is part of the Eastern Nebraska Water Resource Assessment (ENWRA), a group of the six easternmost NRDs in Nebraska. As part of ENWRA, the PMRNRD collects groundwater quality samples at selected ENWRA-operated sites to better understand groundwater quality in glaciated regions.

Finally, the Nebraska Department of Environment and Energy (NDEE) publishes a yearly Groundwater Quality Monitoring Report under State Statute 46-1304 (Nebraska Department of Environmental Quality, 2017) and requested that all Natural Resources Districts develop a network of wells to be included in the report. This report focuses on the trends and changes in nutrient and pesticide concentrations across Nebraska. The NDEE requested the same wells be sampled on an annual or biennial basis to better analyze long-term trends across the state. The PMRNRD collects samples at 20 monitoring wells annually to be published in the report.

The USGS has been cooperating with the PMRNRD to collect the groundwater quality samples since an updated draft of the GWMP was introduced in 1992. The USGS has also collected samples for the PMRNRD to support the PMRNRD's involvement with the ENWRA group and to support the NDEE's Groundwater Quality Monitoring Report. The focus of sampling is monitoring the aquifers for geochemical changes and contamination. Contamination has focused on agrichemicals as the majority of land is utilized for crop production, but there has been an increased interest in learning more about additional anthropogenic contaminants within the groundwater systems. This project will continue to monitor the aquifers as outlined in McGuire and others (2012), with a focus on expanding the current number of samples to better understand groundwater quality variations throughout the aquifers. The results from the yearly sampling in support of the Groundwater Management Plan, the ENWRA project, and the NDEE monitoring will be released to the public through the USGS database, NWIS. These results will be summarized in a presentation to the PMRNRD Board of Directors on a yearly basis.

Objective and Scope

The purpose of the study is to continue collection of water-quality samples from the four main aquifers in the PMRNRD (fig. 1) to support the PMRNRD's various groundwater quality interests. Continued monitoring of the aquifers will allow PMRNRD to manage for the maintained quality of the aquifers for the various uses across the district. The wells within the PMRNRD can be grouped into three categories:

Network wells: previously sampled privately owned domestic, irrigation or stock wells.

Clustered monitoring wells: Multiple wells at a single location screened at differing depths of the aquifer. Owned by the PMRNRD.

ENWRA wells: monitoring wells specifically installed to support the ENWRA project.

The study would:

- Collect pesticide, nutrient, and trace metal samples at network well and clustered monitoring well locations (McGuire and others, 2012) to support the PMRNRD GWMP
 - FY2022: Missouri River alluvial aquifer
 - FY2023: Platte/Elkhorn alluvial aquifer
 - FY2024: Upland alluvial aquifer
 - FY2025: Dakota Sandstone aquifer
- Collect at least 20 samples per year at PMRNRD owned clustered monitoring wells to support State Statute 46-1304 for the DEE (the samples collected at these monitoring wells may overlap with samples collected to support the GWMP).
- Collect samples to support the ENWRA project
- Collect samples to support the DEE National Groundwater Monitoring Network 2021-2022 sampling

All GWMP and DEE sample results will be published on NWIS.

Approach

The purpose of this study is to continue monitoring groundwater quality within the PMRNRD for sampling years spanning 2022 through 2025. The majority of groundwater sampling is a continuation of efforts which began in 2008 and have been published in 2012 (McGuire and others, 2012) and in 2016 (Eastern Nebraska Water Resources Assessment, 2018). The continued monitoring for these projects supports the PMRNRD GWMP, the ENWRA long range plan (Eastern Nebraska Water Resources Assessment, 2017), and the DEE monitoring plan (Nebraska Department of Environmental Quality, 2017). The current monitoring approach will be like that of previous years, with sampling to assess major ions, trace metals, and agrichemicals (McGuire and others, 2012).

The sampling plan for the GWMP focuses on sampling one of the 4 main aquifers per year, with an expanded sampling plan for this 4-year cycle. Thirty sites will be sampled in each aquifer (previous years sampled 20 sites). The 30 sites will be drawn from previously sampled domestic, irrigation, industrial, stock, and municipal wells screened within the targeted aquifer (network wells) (fig. 1). These 30 sites also include clustered monitoring wells screened at various depths within the specified aquifer. These clustered monitoring wells are also annually reported to the DEE in support of statewide monitoring (Nebraska Department of Environmental Quality, 2017), so some cluster well samples will meet multiple objectives. A cluster well is considered one site for GWMP sample counts. Expanded sampling also includes sampling every cluster well each year, instead of biannually, leading to a collection of more than 30 samples within the targeted aquifer each year. Sampling will occur during the third and fourth quarters each federal fiscal year. Please see Appendix 1 for the monitoring well sampling breakdown to fulfill both PMRNRD GWMP and DEE Monitoring.

All wells will be sampled for schedules 101 (nutrients) and 2314 (trace metals and major ions) for analysis at the National Water Quality Laboratory (NWQL) in Denver, CO. A water sample will also be collected for an ELISA triazine analysis (Rubio and others, 1991) at the USGS NEWSC lab. Samples that show a detectable amount of triazine will be sent for further analysis under LCM44 at the USGS Organic Geochemistry Research Laboratory (OGRL). A minimum of seven samples will be randomly submitted for LCM44 analysis if the ELISA screening does not detect triazine in many samples.

The 20 ENWRA wells, grouped into 6 well clusters, will be sampled once a year, separate from the PMRNRD GWMP sampling. Samples will be collected in May. Samples will be submitted to Midwest Labs to be analyzed for major ions and nutrients only, in compliance with the ENWRA long range plan (Eastern Nebraska Water Resource Assessment, 2017).

Site selection for the first aquifer of interest will start in the beginning of the 3rd quarter of each fiscal year of sampling, 2022-2025. Well owners who had consented to previous sampling will be contacted for permission to resample their wells. If the minimum number of samples is not reached from previously sampled wells, new wells will be added into the sampling rotation. Registered domestic, irrigation and monitoring wells within the study area will be analyzed for their suitability. Wells must have a well screen of 20 feet or less to obtain a discrete sample from a section of the aquifer. The screen must be contained within one hydrogeologic unit. The well must be grouted at the surface to prevent surficial flow down the casing. A detailed well log must be available for the well. The well log, coupled with the approximated elevations of the stratigraphic units, will facilitate identifying the stratigraphic unit in which the well is screened.

ENWRA wells and clustered monitoring wells are owned by the PMRNRD and will not need special permission to sample. These wells have detailed well construction and lithologic logs.

Relevance and Benefits

This project is a long-term monitoring network that supports not only the USGS mission in monitoring groundwater quality, but also aids the PMRNRD in collecting water quality information to support their groundwater management plans.

This study will contribute to the USGS mission by assessing availability and quality of the Nation's freshwater supply (Vision component #2) (U.S. Geological Survey, 2021).

The results of this study will benefit the PMRNRD by providing water quality information on the primary aquifers within the District. This information will aid the managers in determining if the resource is suitable for domestic and irrigation usage, or if an alternate resource would need to be explored.

Products

All water-quality data collected for GWMP and DEE sampling will be published through NWIS in accordance with the project data management plan. These data will also be published through the

(LCM44), blanks and replicates are collected with the first, last, and one randomly selected intermediate samples collected.

All GWMP and DEE sampling results will be published on NWIS. All results will be checked and approved by March 31 of the following calendar year. Results will also be mailed to private well owners and supplied to the PMRNRD and the DEE for their monitoring plan.

References

Eastern Nebraska Water Resources Assessment, 2018. Eastern Nebraska Water Resources Assessment Long Range Plan, March 2018: Eastern Nebraska Water Resources Assessment, Lincoln, NE, accessed April 5, 2018 at www.enwra.org

McGuire, V.L., Ryter, D.W., and Flynn, A.S., 2012, Altitude, age, and quality of groundwater, Papio-Missouri River Natural Resources District, eastern Nebraska, 1992 to 2009: U.S. Geological Survey Scientific Investigations Report 2012–5036; 68 p.

Nebraska Department of Environmental Quality, 2017, 2017 Nebraska Groundwater Quality Monitoring Report: Department of Environmental Quality Water Quality Assessment Section Groundwater Unit, Lincoln, Nebr., accessed April 1, 2018 at https://nebraskalegislature.gov/FloorDocs/105/PDF/Agencies/Environmental_Quality_Department_of/66_20171129-105246.pdf

Papio-Missouri River Natural Resources District, 2018. Papio-Missouri River Natural Resources District Groundwater Management Plan: Papio-Missouri River Natural Resources District. Accessed April 2, 2018 at https://www.papionrd.org/wp-content/uploads/2018/01/180109-P-MRNRD-Draft-Final-Appendix-N-GW-Rules-and-Regulations-Post_Public_Hearing-rev2.pdf

Rubio, F.M., Itak, J.A., Scutellaro, A.M., Selisker, M.Y., and Herzog, D.P., 1991, Performance characteristics of a novel magnetic-particle based enzyme-linked immunosorbent assay for the quantitative analysis of atrazine and related triazines in water samples: Food and Agricultural Immunology, v. 3, no. 3-4, 13 p.

U.S. Geological Survey, variously dated, National field manual for the collection of water-quality data: U.S. Geological Survey Techniques of Water-Resources Investigations, book 9, chap. A1–A9.

U.S. Geological Survey, 2021, U.S. Geological Survey 21st-Century Science Strategy 2020–2030: U.S. Geological Survey Circular 1476, 20 p., <https://doi.org/10.3133/cir1476>.

Verstraeten, I.M., and Ellis, M.J., 1995, Reconnaissance of ground-water quality in the Papio-Missouri River Natural Resources District, eastern Nebraska, July through September 1992: U.S. Geological Survey Water-Resources Investigations Report 94–4197, 90 p., <https://pubs.usgs.gov/wri/1994/4197/report.pdf>.

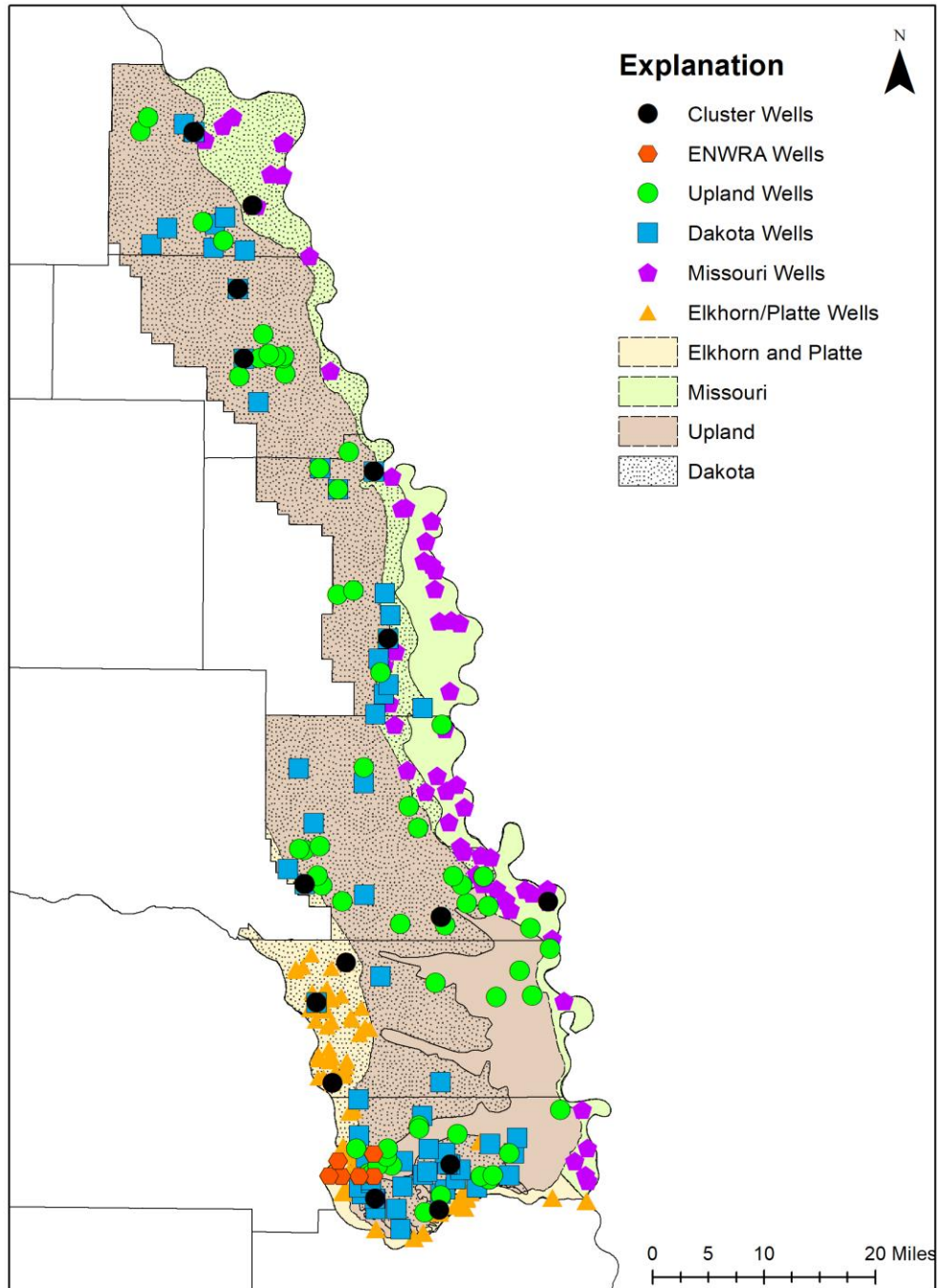


Figure 1. Previously sampled wells within the Pappo-Missouri River Natural Resources District.

Job Hazard Analysis For New Projects

- Check the numbered box(s) for all significant safety concerns this project should address.

Significant

safety concerns are commonly those that require training, purchase of safety equipment, or specialized preparation to address potentially hazardous conditions.

- Identify any unlisted safety concerns at bottom of the page.
- Provide details on the back of this page.

Proposal Number:

Project Title (Short): PMRNRD groundwater quality monitoring and CEC sampling

Project Chief or Proposal Author: Amanda Flynn

<input type="checkbox"/>	Safety Concerns
1. X	Wading, bridge, boat, or cableway measurements or sampling
2.	Working on ice covered rivers or lakes
3.	Measuring or sampling during floods
4.	Well drilling; borehole logging
5.	Electrical hazards in the work area
6.	Construction
7.X	Working in remote areas, communication, office call in procedures
8.X	Ergonomics, carpal tunnel syndrome
9.X	Field Vehicles appropriate for task?- Safety screens, equipment restraints.
10.	All terrain vehicles, snowmobiles

11.	Helicopter or fixed wing aircraft usage
12.X	Site access and traffic control
13.X	Hypothermia or heat stroke
14.X	Hantavirus, Lyme Disease, Histoplasmosis, Pfiesteria, Others?
15.X	Contaminated water with sanitary, biological, or chemical concerns
16.	Immunizations
17.X	Laboratory or mobile laboratory. Chemical hygiene plan.
18.X	Hazardous waste disposal
19.	Hazardous waste site operations
20.	Confined space
21.	Radioactivity
22.	Respiratory protection
23.	Scuba Diving
24.	Electrofishing

<p>Box no.</p>	<p>For each numbered box checked on the previous page, briefly:</p> <p>A. Describe the safety concern as it relates to this project.</p> <p>B. Describe how this safety concern will be addressed. Include training, safety equipment and other actions that will be required.</p> <p>C. Estimate costs.</p>
<p>1.</p>	<p>Park more than 15 feet off the roadway or deploy safety signs and traffic cones as outlined in the roadside-safety plan. Wear a Class III traffic control PFD/float coat or traffic control vest is working from a bridge or along roadway to increase visibility. Always wear a PFD when working on, in, or over water. When wading, wear non-slip shoes, boots, or waders, and use a wading rod for balance and to probe for submerged tripping hazards and drop-offs. Don't attempt to cross a stream if there is any doubt about your safety or the safety of others. Keep an eye upstream and always be watchful for floating debris or ice that may be moving toward you. If debris or ice makes wading unsafe, stay out of the water. If measuring from a boat, the boat operator will be MOCC certified and emergency equipment will be on-board.</p> <p>Estimated cost: \$0.</p>
<p>7.</p>	<p>USGS hydrologists or technicians will visit the sites to sample the wells. The sites are remote, and permission will be secured by the NRD in which the wells lies if needed. Additionally, the hydrologist will be required to visit NRDs cooperating with the project to present updates and results. These trips may require an overnight stay when remote work could be conducted. The hydrologist or technician will be required to alert supervisors as to when they plan on going to the field site or office, the approximate time they plan to spend at the site, and when they return from the site. If an overnight trip is required, the employee must check in with the supervisor at least once a day. All employees should have access to a serviceable cell phone and/or laptop. If there is no cell phone coverage than alternate communications should be provided to ensure field personnel can summon aid or be located.</p> <p>Cost: \$0.</p>
<p>8.</p>	<p>USGS hydrologists and other staff assisting in the project will spend a great deal of time working on computers to collect and analyze data and write the report. The employees will be sitting for long periods of time, causing strain on backs and legs, and repetitive typing can cause stresses in hands and wrists. Working at a computer for long periods of time can strain the eyes. Employees must have access to adjustable work chairs, keyboards and mouse. Workstations should be set up properly to minimize stresses on the body. Ergonomic exercises have been presented to staff. Personnel are encouraged to use those exercises and take periodic breaks from their work stations</p>

	during intensive office sessions. Movement away from the computer to stand and walk will be encouraged after periods of sitting. Cost: \$250
9.	USGS Employees will need to travel away from the office to visit the field sites or other NRD offices. The only equipment with the employee would be a computer and miscellaneous field supplies, or handouts for the NRD. All employees will have taken all training required to operate a motor vehicle for the USGS (defensive driving training) and will have current driving credentials. All equipment will be properly stowed and secured in the back of the vehicle. Cost: \$0. All vehicles have the required safety features and equipment.
12.	<p>Site access should be gained at public locations if possible. Every effort will be made to identify owners of private land and gain written permission for access to that private land if access is beneficial to meeting the goals of the project. Proper site access will include consideration of safe and secure parking of vehicles left unattended during field work.</p> <p>If traffic control required (working along the road/shoulder: approved traffic control vests or high visibility clothing will be worn. A traffic control plan will be developed and implemented. Vehicles and equipment will use warning lights and equipment (advance warning signage and cones) as required by the traffic control plan.</p> <p>Estimated cost: \$0.</p>
13.	<p>When conducting field work in cold-weather conditions, precautions against cold-related injuries will be taken. If there is a potential for full-body immersion, float coats and pants are available in the WSC to safeguard against hypothermia. Protect skin from exposure to cold temperatures that could cause frost bite.</p> <p>When conducting field work in warm-weather conditions, precautions against heat-related injuries must be taken. An ample supply of water for each worker will be carried each day in the field. Breaks in the shade will be taken when daytime air temperatures warrant. Employees should be acclimated to warm temperature prior to spending long hours in warm-weather conditions. When appropriate, work schedules may be adjusted to enable personnel to perform field work during early morning or evening hours – during lower daytime temperatures.</p> <p>Estimated cost: \$0.</p>
14.	To protect against rodent borne diseases, work site gaging stations should be kept clean and free of rodent droppings. Never sweep or vacuum excreta. When cleaning a work site, put on lab-grade gloves and an N-95 respiratory mask. Spray the area to be cleaned with a 10 percent chlorine bleach solution, wait one hour, and then wipe up

	<p>the droppings with paper towels. The dirty towels should be double bagged and placed in the trash.</p> <p>Deer ticks, brown ticks, and mosquitoes may be present. Deer ticks may transmit Lyme’s disease to humans by attachment to the human body. Much of the State is considered to hold at least a medium risk for the contraction of Lyme’s disease. Brown ticks can transmit a variety of diseases to humans by attachment to the human body. Mosquitoes are known to spread West Nile virus in the State. Personal insect repellent that contains DEET is an effective deterrent/repellent for ticks and mosquitoes and will be supplied to field personnel. The use of Gear Spray containing permethrin is recommended to deter ticks and mosquitoes. Long pants may be tucked into boot-tops for a more efficient barrier to ticks. Field personnel should check themselves for ticks at the end of the work day (when returning to the hotel/home).</p> <p>Estimated cost: \$0.</p>
15.	<p>Alcohol-based waterless hand-sanitizer will be provided to workers so they can clean their hands after contact with environmental samples or stream water. In the event of accidental full-body immersion, a thorough shower and clean clothes are recommended as soon as possible.</p> <p>Estimated costs: \$0.</p>
17.	<p>Samples will be processed in the NEWSC mobile laboratory. The laboratory will be outfitted with MSDS for all chemicals and a copy of the Chemical Hygiene Plan will be present. SOPs will also be kept in the lab for the specific lab process. A first-aid kit, emergency eyewash bottle, and a fire extinguisher will be on-board. Staff will be trained on use of items within the lab truck and proper storage of items within the lab truck. All items will be properly secured.</p> <p>Estimated cost: \$0</p>
18.	<p>Methanol may need to be used in the field for cleaning purposes. Methanol will be properly disposed of and stored in the lab truck. When using methanol, work in an area away from all possible ignition sources. Methanol will be used in a well ventilated area. Secure all supplies and equipment before moving mobile lab. Keep door between lab and truck cab closed while driving.</p> <p>Estimated cost: \$0</p>

Discussed job hazard analysis (JHA) with Center		
Collateral Duty Safety Officer	Yes	No

and/or copy of JHA given to

Collateral Duty Safety Officer

Yes

No

Water Center Director:

Date:

Appendix 1.

Sampling plan for monitoring well clusters to fulfill PMRNRD GWMP and DEE monitoring. Each year 30 network wells will be sampled to target a specific aquifer, in addition to sampling all 44 cluster wells.

- a. 2022: Missouri River wells
 - i. 44 Cluster wells (2 clusters in target aquifer)
 - ii. 28 Network wells
- b. 2023: Platte/Elkhorn wells
 - i. 44 Cluster wells (4 clusters in target aquifer)
 - ii. 26 Network wells
- c. 2024: Upland wells
 - i. 44 Cluster wells (2 clusters in target aquifer)
 - ii. 28 Network wells
- d. 2025: Dakota wells
 - i. 44 Cluster wells (8 clusters in target aquifer)
 - ii. 22 Network wells



United States Department of the Interior

U.S. GEOLOGICAL SURVEY
Water Resources Discipline
Nebraska Water Science Center
5231 South 19th Street
Lincoln, NE 68512-1271

January 26, 2022

John Winkler
Papio-Missouri River Natural Resources District
8901 South 154th Street
Omaha, NE 68138

Dear Mr. Winkler:

Enclosed are two copies of Joint Funding Agreement No. 22NRJFA00340 for four years of work in groundwater quality sampling, analysis and reporting. As shown on the enclosed summary of proposed funding, the total amount of the agreement is \$774,900 or \$152,400 for the U.S. Geological Survey and \$622,500 for the Papio-Missouri River Natural Resources District. Please sign the agreement and return by email to aflynn@usgs.gov. Work cannot be started until we receive the signed agreement.

Work performed with funds from this agreement will be conducted on a fixed-price basis under the authority of statute 43 USC 36C. Billings will be rendered quarterly. The results of all work under this agreement will be available for publication by the U.S. Geological Survey.

Please contact Brent Hall at 402-328-4121 if you have any questions concerning this agreement.

Sincerely,

Steven M. Peterson, Director
USGS Nebraska Water Science Center

3 Enclosures

USGS DUNS No. 949286512

Form 9-1366
(May 2018)

U.S. Department of the Interior
U.S. Geological Survey
Joint Funding Agreement
FOR
Water Resource Investigations

Customer #: 600000134
Agreement #: 22NRJFA00340
Project #: NR00GS1
TIN #: 47-0542469

Fixed Cost Agreement YES[X] NO[]

THIS AGREEMENT is entered into as of January 25, 2022, by the U.S. GEOLOGICAL SURVEY, Nebraska Water Science Center, UNITED STATES DEPARTMENT OF THE INTERIOR, party of the first part, and the PAPIO-MISSOURI RIVER NATURAL RESOURCES DISTRICT party of the second part.

1. The parties hereto agree that subject to the availability of appropriations and in accordance with their respective authorities there shall be maintained in cooperation **the groundwater quality sampling, analysis and reporting for the Papio-Missouri River Natural Resources District**, herein called the program. The USGS legal authority is 43 USC 36C; 43 USC 50, and 43 USC 50b.

2. The following amounts shall be contributed to cover all of the cost of the necessary field and analytical work directly related to this program. 2(b) include In-Kind-Services in the amount of \$0.00

- (a) \$152,400 by the party of the first part during the period April 1, 2022 to June 30, 2026
- (b) \$622,500 by the party of the second part during the period April 1, 2022 to June 30, 2026
- (c) Contributions are provided by the party of the first part through other USGS regional or national programs, in the amount of: \$0

Description of the USGS regional/national program:

- (d) Additional or reduced amounts by each party during the above period or succeeding periods as may be determined by mutual agreement and set forth in an exchange of letters between the parties.
- (e) The performance period may be changed by mutual agreement and set forth in an exchange of letters between the parties.

3. The costs of this program may be paid by either party in conformity with the laws and regulations respectively governing each party.

4. The field and analytical work pertaining to this program shall be under the direction of or subject to periodic review by an authorized representative of the party of the first part.

5. The areas to be included in the program shall be determined by mutual agreement between the parties hereto or their authorized representatives. The methods employed in the field and office shall be those adopted by the party of the first part to insure the required standards of accuracy subject to modification by mutual agreement.

6. During the course of this program, all field and analytical work of either party pertaining to this program shall be open to the inspection of the other party, and if the work is not being carried on in a mutually satisfactory manner, either party may terminate this agreement upon 60 days written notice to the other party.

7. The original records resulting from this program will be deposited in the office of origin of those records. Upon request, copies of the original records will be provided to the office of the other party.

8. The maps, records or reports resulting from this program shall be made available to the public as promptly as possible. The maps, records or reports normally will be published by the party of the first part. However, the party of the second part reserves the right to publish the results of this program, and if already published by the party of the first part shall, upon request, be furnished by the party of the first part, at cost, impressions suitable for purposes of reproduction similar to that for which the original copy was prepared. The maps, records or reports published by either party shall contain a statement of the cooperative relations between the parties. The Parties acknowledge that scientific information and data developed as a result of the Scope of Work (SOW) are subject to applicable USGS review, approval, and release requirements, which are available on the USGS Fundamental Science Practices website <https://www.usgs.gov/about/organization/science-support/science-quality-and-integrity/fundamental-science-practices>

U.S. Department of the Interior
U.S. Geological Survey
Joint Funding Agreement
FOR

Customer #: 600000134
Agreement #: 22NRJFA00340
Project #: NR00GS1
TIN #: 47-0542469

Water Resource Investigations

9. Billing for this agreement will be rendered quarterly. Invoices not paid within 60 days from the billing date will bear Interest, Penalties, and Administrative cost at the annual rate pursuant the Debt Collection Act of 1982, (codified at 31 U.S.C. § 3717) established by the U.S. Treasury.

USGS Technical Point of Contact

Name: Brent Hall
Hydrologist
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U.S. Geological Survey
United States
Department of Interior

Papio-Missouri River Natural Resources District

Signature

Signatures

By _____ Date: _____
Name: Steven M. Peterson, Director
Title: Director

By _____ Date: _____
Name:
Title:

By _____ Date: _____
Name:
Title:

By _____ Date: _____
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