

**Water Sustainability Fund**

Application for Funding

Section A.

**ADMINISTRATIVE**

**PROJECT NAME:** West Papillion Creek Regional Detention Basin WP-4

**SPONSOR'S PRIMARY CONTACT INFORMATION (Not Consultant's)**

Sponsor Business Name: Papio-Missouri River Natural Resources District (P-MRNRD)

Sponsor Contact's Name: John Winkler, General Manager

Sponsor Contact's Address: 8901 S. 154<sup>th</sup> Street, Omaha, NE 68138

Sponsor Contact's Phone: 402-444-6222

Sponsor Contact's Email: jwinkler@papionrd.org

1. **Funding** amount requested from the Water Sustainability Fund:

**Grant** amount requested. \$ 7,660,000

- If requesting less than 60% cost share, what %? N/A

**If a loan is requested** amount requested. \$ N/A

- How many years repayment period? N/A
- Supply a complete year-by-year repayment schedule. N/A

2. **Neb. Rev. Stat. § 2-1507 (2)**

Are you applying for a **combined sewer overflow project**? YES  NO

**If yes:**

- Do you have a Long Term Control Plan that is currently approved by the Nebraska Department of Environmental Quality? YES  NO
- Attach a copy to your application. Click here to enter text.
- What is the population served by your project? Click here to enter text.
- Provide a demonstration of need. Click here to enter text.
- **Do not complete the remainder of the application.**

3. **Permits Required/Obtained** Attach a copy of each that has been obtained. For those needed, but not yet obtained (box “NO” checked), 1.) State when you will apply for the permit, 2.) When you anticipate receiving the permit, and 3.) Your estimated cost to obtain the permit.

(N/A = Not applicable/not asking for cost share to obtain)  
 (Yes = See attached)  
 (No = Might need, don’t have & are asking for 60% cost share to obtain)

G&P - T&E consultation (required)	N/A <input type="checkbox"/>	Obtained: YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>
DNR Surface Water Right	N/A <input type="checkbox"/>	Obtained: YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>
USACE (e.g., 404/other Permit)	N/A <input type="checkbox"/>	Obtained: YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>
FEMA (CLOMR)	N/A <input checked="" type="checkbox"/>	Obtained: YES <input type="checkbox"/>	NO <input type="checkbox"/>
Local Zoning/Construction	N/A <input type="checkbox"/>	Obtained: YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>
Cultural Resources Evaluation	N/A <input type="checkbox"/>	Obtained: YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>
Other (provide explanation below)	N/A <input type="checkbox"/>	Obtained: YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>

WP-4 is currently in the final design and permitting phase and all efforts to obtain the required permits for this site are in progress. Several permits require final plans and specifications before a permit application can be made.

Specifically, a US Army Corps of Engineers (USACE) 404 permit, which includes a Nebraska Department of Environment and Energy (NDEE) 401 Certification, a G&P T&E consultation, and a cultural resources evaluation is in progress. The Section 404 permit application (NWO-2017-01041-WEH) was issued for public notice by the USACE Omaha Regulatory Office on February 25, 2021. An Individual Permit (IP) is pending. A 401 Water Quality Certification was provided by NDEE on April 22, 2021.

Other required permits for the project include a National Pollutant Discharge Elimination System (NPDES) general permit administered by the City of Gretna and NDEE; a Nebraska Department of Natural Resources (NeDNR) application for a “Permit to Impound Water” and “Application for Approval of Plans for Dams”; a construction permit from NDEE for sanitary sewer improvements; Sarpy County right-of-way occupancy permit; and a Sarpy County building demolition permit. The Water Sustainability Fund (WSF) monies will be used to cost share the necessary development and implementation of the permits.

Table 1: Estimated Future Permit Costs and Dates

Permit	Cost	Permit Submittal Date	Permit Approval Date
USACE Section 404 Permit	\$9,300	May 2020	April 2021
NGPC T&E Consultation	Included with USACE Section 404 permit		
NDEE Section 401 Water Quality Certificate			
NDNR permit to impound water	\$15,000	February 2022	
NDNR permit for approval for dams	Included with NDNR permit to impound water	February 2022	
NDEE NPDES and City of Gretna stormwater permit	\$10,500	February 2022	
NDEE sanitary sewer construction permit	\$1,800	February 2022	
Sarpy County ROW Occupancy Permit	\$400	February 2022	
Permits Total	\$37,000		

4. **Partnerships**

List each Partner / Co-sponsor, attach documentation of agreement:

The WP-4 project and associated improvements (Project) brings together several agency partners that have jurisdiction within the project area. The Papio-Missouri River NRD (P-MRNRD), the Papillion Creek Watershed Partnership (PCWP), the City of Gretna, Sarpy County, and the Nebraska Game and Parks Commission (NGPC) are all stakeholders in the project. Sarpy County and the NGPC are funding partners and the NGPC will also participate in the design of the in-lake fisheries and recreational facilities. Sarpy County and the City of Gretna oversee key infrastructure, including sewer lines and county roads, which will be influenced by the project. Finally, the P-MRNRD and the PCWP members work together to provide planning, administration, and cost-share funding for the Project.

### Papio-Missouri River NRD (P-MRNRD)

Nebraska's Natural Resources Districts, including the Papio-Missouri River Natural Resource District, were created by the Nebraska Legislature in 1972 and began serving the people of the state by managing and protecting Nebraska's natural resources. The P-MRNRD's boundary includes all of Sarpy, Douglas, Washington, and Dakota counties and the eastern halves of Burt and Thurston Dakota counties. The P-MRNRD serves the largest population area of the 23 state NRDs. P-MRNRD has taxing authority and has the funding capacity to meet cost-share dollars.

### Papillion Creek Watershed Partnership (PCWP)

P-MRNRD is the administrative agent for the Papillion Creek Watershed Partnership (PCWP). This partnership was formed in 2001 to address water quantity and water quality in the Papillion Creek Watershed. Members of the partnership include the Papio-Missouri River Natural Resource District, the cities of Gretna, Omaha, Bellevue, Ralston, Papillion, LaVista, Boys Town, and Sarpy County. In its 2019 Updated Watershed Plan, the PCWP identified WP-4 as a program project for implementation in FY 2020 to FY 2024. PCWP members collect a watershed development fee on new development to cover approximately one-third of the estimated costs of the structural portion of the watershed management plan.

### City of Gretna

WP-4 is located in the unincorporated area of Sarpy County (County) and within the extra-territorial jurisdictional (1-mile) boundary of the City of Gretna (City). As a result of the project, a City sanitary sewer lift station and associated network piping will be abandoned and a new City lift station and network piping constructed.

Upon completion of the project, the project site will be transferred to the City of Gretna for ownership and maintenance. P-MRNRD will retain a permanent easement along the dam footprint for O&M activities. The city of Gretna fully supports the Project and is a funding partner for sanitary sewer improvements.

### Sarpy County

Schram Road is a major east/west roadway in Sarpy County. There is a ¼ mile gap between 204<sup>th</sup> Street and approximately 210<sup>th</sup> Street in which the road does not currently exist but will be constructed in the future. A portion of the future roadway will be graded as part of this project, from 204<sup>th</sup> Street to the right abutment of the North Water Quality Basin. The segment between 204<sup>th</sup> Street and the recreation access area will be surfaced with gravel until the full Schram Road connection is constructed in the future. Sarpy County fully supports the project and is a funding partner for the roadway enhancements.

### Nebraska Game and Parks Commission (NGPC)

NGPC administers the Federal Sport Fish Restoration Program and Motorboat Access Program in Nebraska which provides cost-share for fishery projects, boating access, and aquatic education. During the development of the preliminary design, several meetings were held with NGPC staff to discuss in-lake enhancements such as off-shore

breakwaters, rock shoals, and excavating the pool area to provide variable water depths for fishing. Off-lake enhancements include angler access and a public access area with vehicle and boat parking, a boat ramp and a dock, a picnic shelter, and toilets. During final design, NGPC will continue to be involved in the design of the fishery enhancements and public access features. NGPC is a funding partner for in-lake fisheries and recreation features.

**5. Other Sources of Funding**

Identify the costs of the entire project, what costs each other source of funding will be applied to, and whether each of these other sources of funding is confirmed. If not, please identify those entities and list the date when confirmation is expected. Explain how you will implement the project if these sources are not obtained.

Based on preliminary design estimates, the total Project cost is estimated to be \$12.6 million. An application for funding from the U.S. Fish and Wildlife Service’s Sportfish Restoration Fund is underway. This application will be for fish habitat construction and angler access within the reservoir created by WP-4. The fund is administered locally by the NGPC and coordination on the design of these enhancements with the NGPC has been on-going.

If the other funding partners are unable to secure necessary funds, P-MRNRD ~~may delay the construction of the Project and~~ use its General Fund to complete the Project.

Table 2: Project Cost and Funding Source Breakdown

	Cost Estimate	40% Local Cost Share					WSF Grant Request (60%)
		NGPC Share	Gretna Share	Sarpy County Share	P-MRNRD Share	Total Local Cost Share	
<b>Engineering Design Services</b>	\$634,000		\$10,000	\$68,000	\$176,000	\$254,000	\$380,000
<b>Permitting</b>	\$37,000				\$15,000	\$15,000	\$22,000
<b>Other Professional Services (Administrative, Legal, Fiscal)</b>	\$1,149,000				\$459,000	\$459,000	\$689,000
<b>Land Acquisition</b>	\$3,357,000				\$1,343,000	\$1,343,000	\$2,014,000
<b>Engineering Construction Services</b>	\$828,000			\$54,000	\$277,000	\$331,000	\$497,000
<b>Construction</b>	\$6,913,000	\$150,000	\$100,000	\$500,000	\$2,105,000	\$2,705,000	\$4,058,000
<b>Totals</b>	\$12,918,000	\$150,000	\$110,000	\$622,000	\$4,375,000	\$5,107,000	\$7,660,000

## 6. **Overview**

In 1,000 words *or less*, provide a brief description of your project including the nature/purpose of the project and its objectives. Do not exceed one page!

P-MRNRD, in partnership with the City of Gretna, Sarpy County, and NGPC, is leading the construction of a regional flood control and water quality detention basin on Wehrspann Creek and within the West Papillion Creek sub-watershed. This basin, known as WP-4, was initially discussed within the Papio Creek Watershed Management Plan (PCWMP) (HDR 2009). The Papillion Creek Watershed Partnership (PCWP) has been working on improved stormwater and floodplain management by implementing projects identified in the PCWMP since 2001. Specifically, PCWP members consist of the cities of Bellevue, Bennington, Boys Town, Gretna, La Vista, Omaha, Papillion, and Ralston; Sarpy County; and the P-MRNRD. The Papillion Creek Watershed covers 402 square miles of Nebraska's most populated region which extends from Washington County southward through Douglas and Sarpy counties.

The West Papillion Creek sub-watershed has a drainage area of 135 square miles and while currently moderately populated, is experiencing rapid development. Consequently, because of the conversion of agricultural lands to developed spaces, major storm events pose a significant flooding threat. The PCWP, led by P-MRNRD, seeks to implement appropriate surface runoff control measures to keep pace with development by reducing peak flows and improving water quality. In 2009, the PCWMP described a strategy to construct a combination of regional detention basins, water quality basins, and Low Impact Development (LID) strategies throughout the watershed. Highlighted improvements implemented as of July 2021 include:

- A proactive, flood protection strategy with 'regional detention', which empowers communities to plan for flood protection by preserving land for centralized stormwater facilities. When using this strategy, construction of flood protection structures may occur prior to full build-out of the watershed area.
- A total of five of 12 potential water quality basins have been constructed. The construction of Zorinsky Basin No. 2 was completed in the spring of 2021.
- A total of six of the original 14 regional detention basins have been constructed. The construction of WP-6 and WP-7 were completed in the summer of 2021. WP-1 is slated to begin construction in the fall of 2021 or early 2022.

As projects in the PCWMP are implemented, every 5 years a re-prioritization of the remaining projects is defined. WP-4 was designated as a program project for FY 2020 to FY 2024 because of impending development and the opportunity to reduce the potential for flood damage in the Forest Run subdivision which is located immediately downstream of the project.

Once constructed, WP-4 will contribute to collective flood control by protecting homes and businesses along Wehrspann Creek. Furthermore, WP-4 is located upstream of Wehrspann Lake and its associated upstream sediment basin, a federally designed and constructed flood control project by USACE. The Project will also provide additional benefits of water quality improvement including streambank stabilization and recreation. Highlights of the WP-4 project include:

- The earthen dam will consist of a primary spillway outlet pipe designed to control the permanent pool elevation in the reservoir. The crest of the auxiliary spillway is designed to provide flood storage and reduce the risk of flooding for storm events up to the 500-year storm.
- WP-4 will be managed as a fishery and provide non-motorized boating access; thereby, provide fishing, boating, and kayaking opportunities.
- Conducted during the preliminary design phase, a stream assessment found that the stream channel reaches are degraded, are deeply incised, and are disconnected from the floodplain. Future flows, regulated by the dam's outlet pipe, will create grade stability and prevent continued erosion.
- The reservoir will create both deep and shallow aquatic habitats and improvements to the riparian and buffer zones surrounding the water creating a diverse fishery.
- Trails, boat ramps, picnic facilities, and angler access points constructed as part of the WP-4 project will improve the available recreation opportunities in a growing urban area.
- Upon completion, the City of Gretna will be responsible for maintaining the recreational features, while P-MRNRD will be responsible for the operation and maintenance of the dam and associated appurtenances.

## 7. **Project Tasks and Timeline**

Identify what activities will be conducted to complete the project, and the anticipated completion date.

- What activities (Tasks) are to be completed.
- An estimate of each Tasks expenditures/cost per year.
- Activities in years 4 through project completion under a single column.

Table 3 outlines the project tasks, approximate timeline, and relevant expenditures. The information is provided in terms of cost per year, with costs that have occurred pre-2020 defined as "Year 0." In summary, the project is expected to cost approximately \$12,918,000; approximately \$1,793,000 has already been expended and expenditures are expected to be equally divided over a 3-year period.

Table 3: Anticipated Tasks and Schedule

Tasks	Year 0\$ (pre-2020)	Base Cost Estimate	Year 1\$ (2021)	Year 2\$ (2022)	Year 3\$ (2023)	Total \$ Amt.
Engineering Design & Bidding	\$509,000	\$634,000	\$317,000	\$317,000		\$634,000
Permitting	\$110,000	\$37,000	\$19,000	\$18,000		\$37,000
Other Professional Services (Administrative, Legal, Fiscal)	\$163,000	\$1,149,000	\$341,000	\$416,000	\$392,000	\$1,149,000
Land Acquisition	\$1,011,000	\$3,357,000	\$3,357,000			\$3,357,000
Engineering Construction Services		\$828,000		\$414,000	\$414,000	\$828,000
Construction		\$6,913,000		\$3,405,000	\$3,508,000	\$6,913,000
Totals	\$1,793,000	\$12,918,000	\$4,034,000	\$4,570,000	\$4,314,000	\$12,918,000

8. **IMP**

Do you have an **Integrated Management Plan** in place, or have you initiated one?

YES

NO

Sponsor is not an NRD



Section B.

DNR DIRECTOR'S FINDINGS

**Prove Engineering & Technical Feasibility**

(Applicant must demonstrate compliance with Title 261, CH 2 - 004)

1. Does your project include physical construction (defined as moving dirt, directing water, physically constructing something, or installing equipment)?  
YES  NO

If you answered "YES" you must answer all questions in section 1.A.

If you answer "NO" you must answer all questions in section 1.B.

If "YES", it is considered mostly structural, so answer the following:

- 1.A.1 Insert a feasibility report to comply with Title 261, Chapter 2, including engineering and technical data;

As the Papillion Creek Watershed becomes more developed, there is an urgency to identify major features and land acquisition needs for 6 proposed regional detention sites before the sites become unavailable due to development. In 2017, WP-4 was one of the six damsite projects identified for preliminary design and the preparation of a Section 404 permit application. A feasibility study and preliminary design was completed March 2018 and a WP-4 60% Design Report (HDR/JEO 2018) is provided as Attachment A. Hereafter, this report will be referred to as the WP-4 DR. WP-4 DR describes the preliminary design of the WP-4 flood damage reduction structure and associated improvements located on Wehrspann Creek, as initially identified in the 2009 Papillion Creek Watershed Management Plan (PCWMP).

- 1.A.2 Describe the plan of development (004.01 A);

WP-4 is one of 14 flood control structures originally identified in the PCWMP to provide regional detention of stormwater during flood events and water quality improvements. The PCWMP, developed to reduce flood risk, addresses land extending from the upper reaches of Washington County in the north, south to the confluence with the Missouri River in Sarpy County, and across Douglas County. The PCWMP was developed to document an implementation prioritization system based on reducing flood risk, mitigating increased runoff volumes from future development, and addressing water quality concerns. The 2019 Update of the PCWMP identified WP-4 as a program project for implementation during FY 2020 to FY 2024.

WP-4, located within Sarpy County and the extraterritorial jurisdiction (ETJ) of the City of Gretna, was initially identified in the PCWMP and there is currently a sense of urgency associated with this project as urbanization is occurring within the drainage basin. In the 2019 update to the PCWMP, WP-4 was identified as one of three structures

for implementation in FY 2020 to FY 2024 by the PCWP. Furthermore, as land is developed, fewer viable areas are available for flood protection and those areas which are available become increasingly expensive as land prices rise. Residents within the drainage area will see flood and recreation benefits when the project is implemented along with development.

1.A.3 Include a description of all field investigations made to substantiate the feasibility report (004.01 B);

The design of WP-4 has included several rounds of field investigations led by P-MRNRD's design team consisting of HDR and JEO Consulting Group, Inc. (HDR/JEO).

Geotechnical Analysis

Subsurface geotechnical field investigations provided information about the stratigraphy of the soils where permanent dam features would be constructed for the Project. Specifically, a preliminary geotechnical investigation was conducted in June 2017 and January 2018. The investigation consisted of a total of 22 exploratory test borings and 2 Cone Penetrometer Test (CPT) soundings. These borings and CPTs were completed for the proposed earthen Main dam embankment and auxiliary spillway with the exception of 1 boring that was completed for a box culvert to be constructed for the North Water Quality Water Quality Basin. Laboratory testing provided information on the characteristics of the soil including strength of the materials, consolidation properties, and suitability for use as borrow material. Field and laboratory data was used to perform preliminary seepage, stability, and settlement analyses for the WP-4 dam. A preliminary geotechnical design report documented the findings of the investigation and presented preliminary recommendations for design and construction.

Site Analysis

The HDR/JEO team completed several site visits to confirm utility locations and to coordinate aspects of design and construction related to the dam elements including improvements to Schram Road and the relocation of the sanitary sewer.

Topographic Survey

To provide better design information, a detailed topographic survey was conducted in June 2017 in the area of the proposed dam embankment and auxiliary spillway footprint. This data was supplemented with existing LiDAR data and combined to create a topographic surface used for preliminary design. Benchmarks were established throughout the Project site. Additional topographic survey will be required for final design and throughout the construction process.

Wetland Delineation and Stream Assessment

In preparation of the Section 404 individual permit application, a wetland delineation and a stream assessment were completed by HDR in the summer of 2017. The wetland delineation identified the location of jurisdictional water bodies on the project site. This information was used during preliminary design to determine project impacts and develop design alternatives to avoid, minimize, or mitigate potential impacts. The stream

assessment documented the current channel and floodplain conditions and evaluated how the Project may impact future channel conditions utilizing USACE stream assessment guidance and tools.

It was found that the unavoidable impacts require 0.44 acres of wetland mitigation and 350 linear feet of stream mitigation which can be mitigated on-site. The net gain in aquatic function alleviates the need for stream channel mitigation as a result of the inundation; however, the stream channel lost as a result of the embankments requires mitigation by creating native buffers upstream along Wehrspann Creek. The wetland delineation and stream assessment are documented in the following reports:

- Wetland Delineation Report – Retention Basin WP-4, Gretna, NE (HDR 2017)
- Stream Assessment for Retention WP-4 Basin, Gretna, NE (HDR 2017)

As of June 2021, the Section 404 Individual Permit had completed public review and was being written by the Omaha USACE Regulatory Office. The permit is anticipated to be in hand by the end of 2021.

**1.A.4 Provide maps, drawings, charts, tables, etc., used as a basis for the feasibility report (004.01 C);**

A variety of maps, drawings, tables, and charts are provided as Attachment A. Figure 1 shows the Papillion Creek Watershed and the relative location of WP-4 to other flood control structures in the watershed. WP-4 is located near the western edge of the Papillion Creek Watershed in Sarpy County.

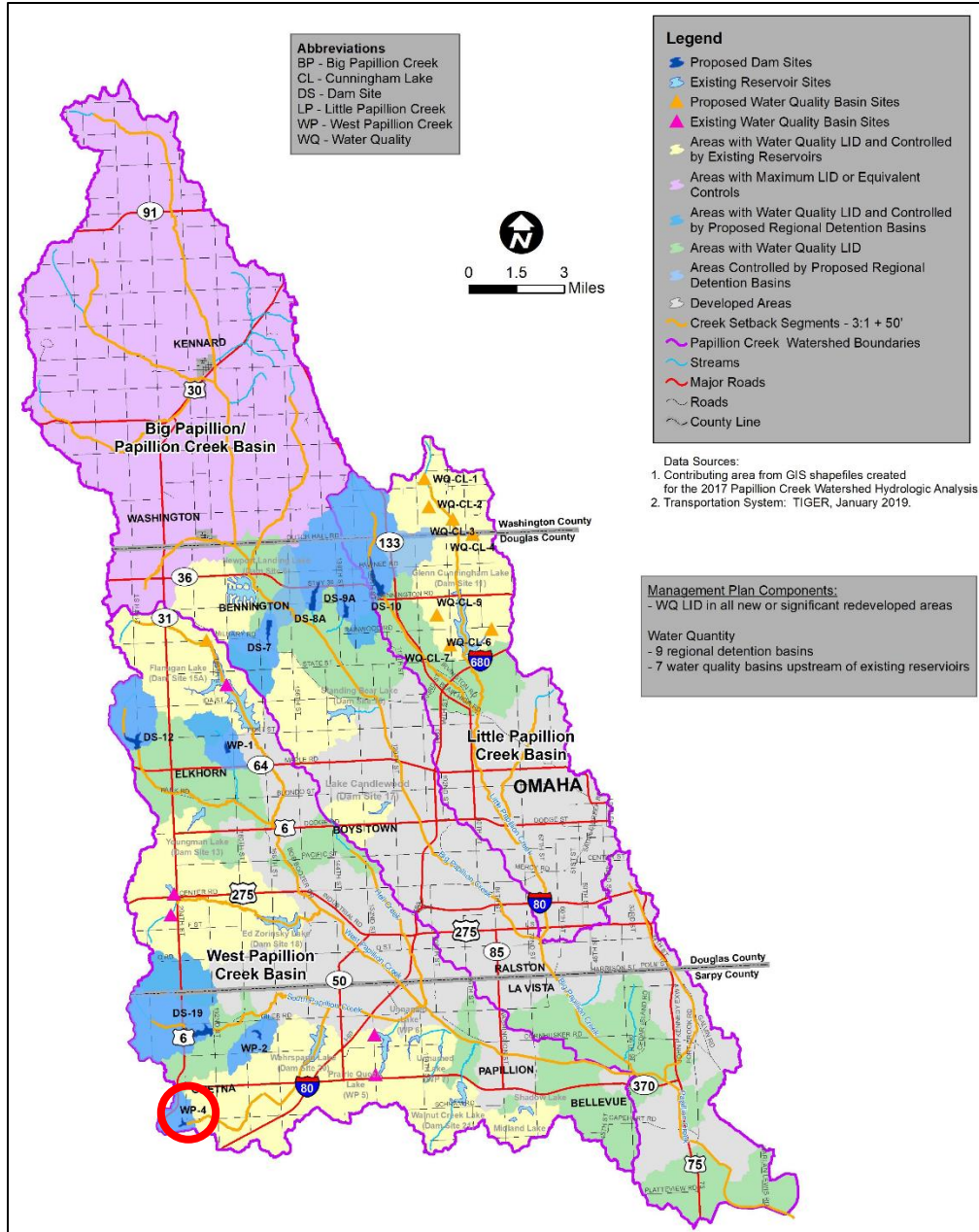


Figure 1: Papillion Creek Watershed and Watershed Management Plan Elements

WP-4 is located west of 204<sup>th</sup> Street, south of Schram Road, and north of Lakeview SID as illustrated in Figure 2. Figure 2 shows the major Project elements including the dam structure, recreational features, fishery enhancements, and sanitary sewer improvements.

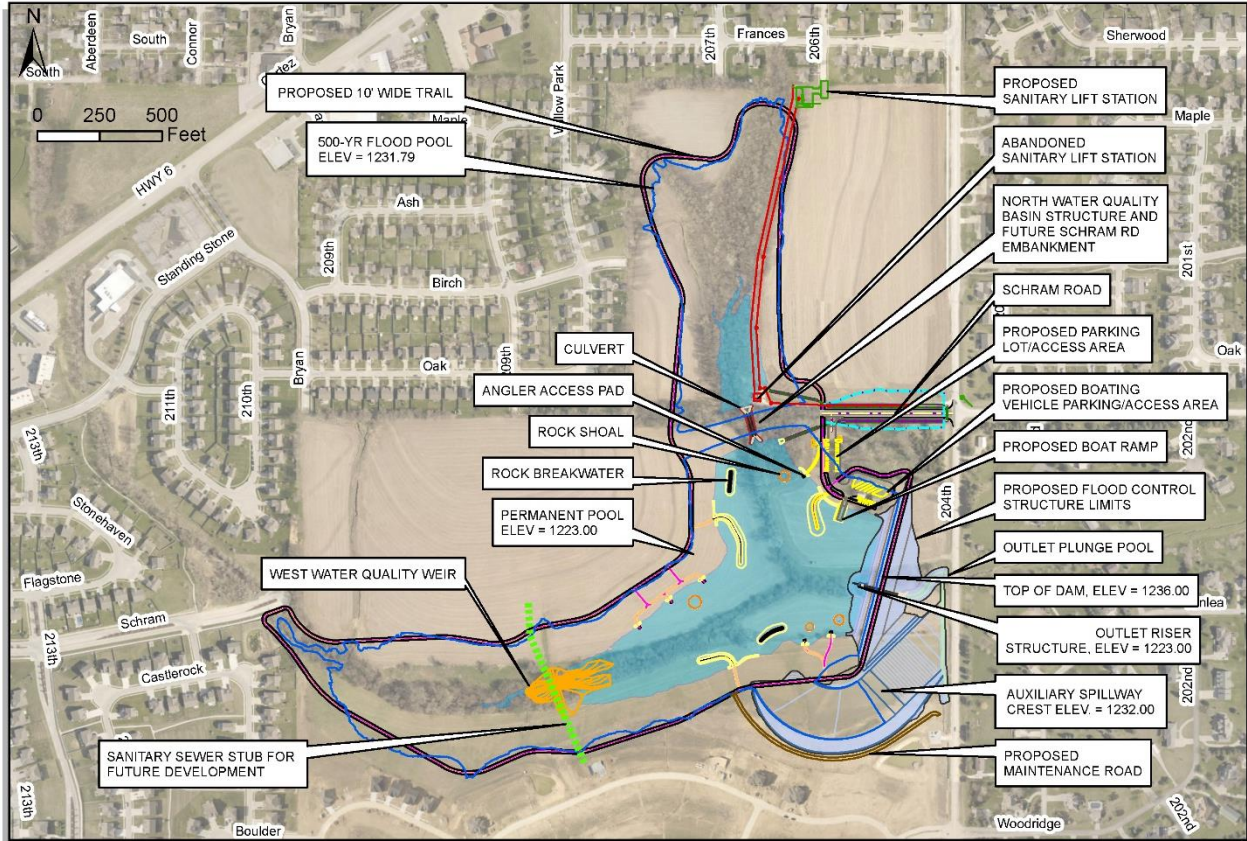


Figure 2: WP-4 Preliminary Design and Project Area

Table 4 is a stage-storage discharge table which illustrates how the WP-4 reservoir is proposed to operate and provide flood control (HDR/JEO 2018). When runoff enters the reservoir, water will be stored until the water level reaches the principal spillway crest (EL 1223). Water will then flow through the principal spillway pipe and runoff will continue to be stored. If water levels increase to a 500-year event, water will continue to flow through the principal spillway and water will also begin to flow through the auxiliary spillway (EL 1232). The controlled release through the spillways controls the volume of water sent downstream. There is approximately 263 AF of flood storage between the principal spillway crest and auxiliary spillway crest.

The conservation or normal pool defined at the create of the principal spillway (EL 1223) creates a total surface water area of 15.4 acres. The spillway sizes and elevations were determined through using industry recognized dam design criteria and design procedures. As shown in Table 4, the principal spillway crest and permanent pool are set at elevation 1223.0, the auxiliary spillway crest is set at elevation 1232.0 and the top of dam is set at elevation 1236.0.

Table 4: WP-4 Preliminary Design Stage-Storage Discharge

Stage	Surface Area (ac)	Accumulated Storage Volume (ac-ft)	Principal Spillway Outflow (cfs)	Auxiliary Spillway Outflow (cfs)	Notes
<b>1223.0</b>	<b>15.40</b>	<b>66.2</b>	<b>0</b>		<b>Principal Spillway Crest</b>
1224.0	18.18	83.0	75		
1225.0	19.96	102.1	210		
1226.0	23.47	123.8	218		
1227.0	26.45	148.8	226		
1228.0	29.92	177.0	234		
1229.0	33.55	208.7	242		
1230.0	37.47	244.2	250		
1231.0	42.40	284.2	257		
<b>1232.0</b>	<b>47.08</b>	<b>328.9</b>	<b>264</b>	<b>0</b>	<b>Auxiliary Spillway Crest</b>
1233.0	52.52	378.7	271	58	
1234.0	56.14	433.0	277	587	
1235.0	59.36	490.8	284	1712	
<b>1236.0</b>	<b>62.56</b>	<b>551.7</b>	<b>296</b>	<b>3120</b>	<b>Top of Dam</b>

1.A.5 Describe any necessary water and/or land rights including pertinent water supply and water quality information (004.01 D);

According to the NDNR’s water surface interactive map, the only water rights along Wehrspann Creek are storage permits for the downstream Wehrspann Lake Sediment Basin (A-17800) and Wehrspann Lake (A-16141). There are no concerns with obtaining a storage permit for WP-4.

The dam and associated appurtenances fall under the jurisdiction of NeDNR’s Dam Safety Division. Prior to completion, construction plans and specifications for a high hazard dam will be submitted to NDNR for review and P-MRNRD will apply for a water storage permit. An Emergency Action Plan with a breach inundation map and evacuation plan will be required for a high hazard dam and will be developed as part of this Project.

Land rights will be required for the construction, operation, and maintenance of this site. The P-MRNRD owns 20.3 acres, or 25 percent, of the total 81.3 acre project area and is currently in discussions with the property owner of the remaining 61 acres. P-MRNRD intends to acquire the land by fee-title from the willing property owner. Several flowage easements will also be needed in the upper portions of the pool area and no problems are anticipated to secure the easements. Figure 3 illustrates parcel ownership within the project area.

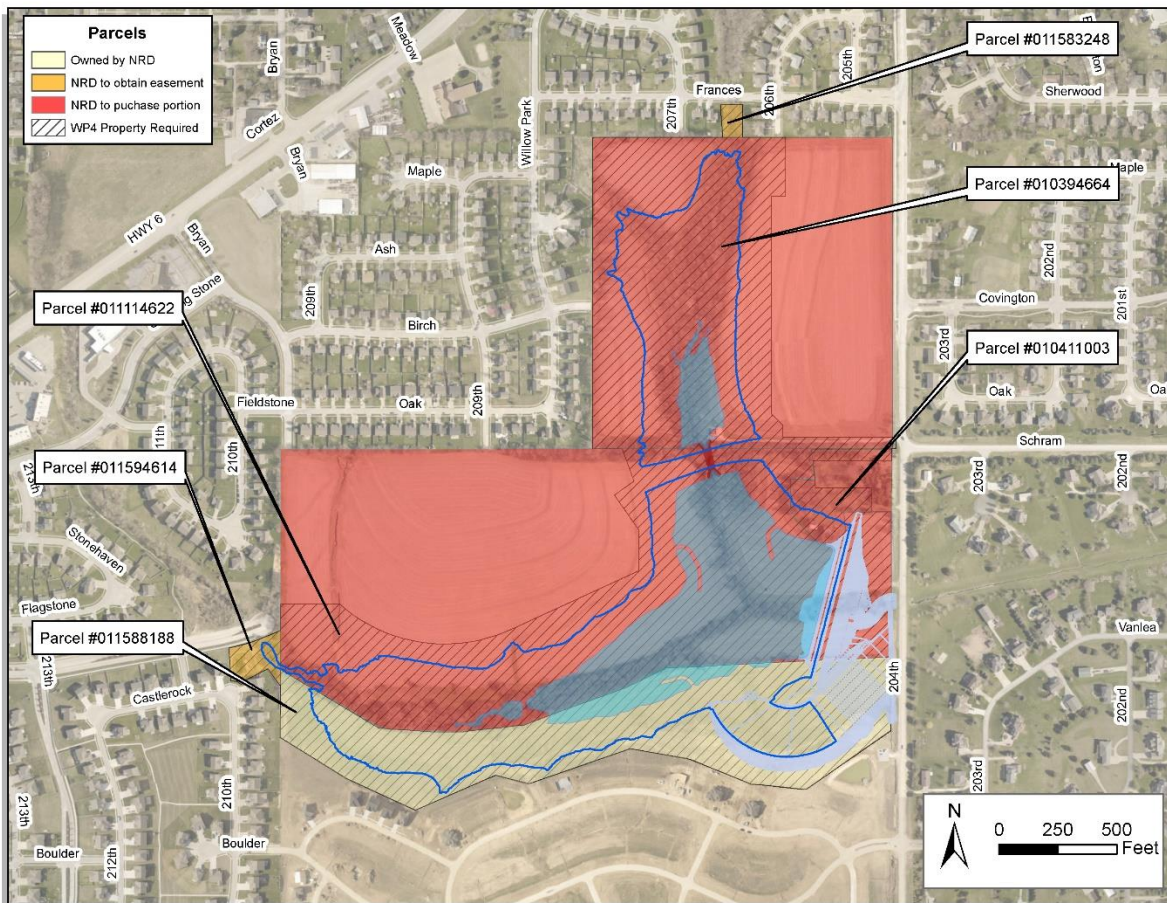


Figure 3: Land Acquisition and Parcel Ownership

1.A.6 Discuss each component of the final plan (004.01 E);

Upon completion, the WP-4 site will provide:

- Flood Reduction WP-4 will create a 15.4-acre permanent pool (EL 1223) with a storage volume of 66.2 AF. There is approximately 263 AF of flood storage between the principal spillway crest and auxiliary spillway crest. For a 500-year event, the peak discharge will be reduced from 1224 cfs to 237 cfs.
- Water Quality Enhancements – North Water Quality Basin is segmented from the main reservoir by the proposed Schram Road extension, while the West Water Quality Basin, separated by a smaller berm on the main channel, will capture sediment and other pollutants before runoff enters the main reservoir. Sediment will be periodically removed from the water quality basins. These water quality basins will improve the longevity of the flood reduction benefits and improve water quality of the main reservoir.

- Public Access Area – includes a public access area located near the north abutment of the dam and accessible from an improved Schram Road. This will include a parking lot, boat ramp, kayak boat ramp, picnic shelter, latrine, water, and solar lighting. The reservoir will be limited to non-motorized watercraft.
- Fishery Enhancements – included with the public access and recreation improvements, the aquatic habitat enhancements are currently being coordinated with the NGPC. The NGPC Fisheries Division Staff participated in the preliminary design process by providing input regarding angler access nodes and breakwaters, reservoir bottom grading, underwater shoals and habitat structures, and recommended water depths.
- Trail – A 10-foot wide, 1.8-mile concrete surface trail will be constructed around the perimeter of the lake. Future connections to Gretna’s trail and sidewalk system will not be part of this Project.
- Sanitary Sewer – An existing sanitary sewer lift station and associated gravity sewers and force mains will be abandoned and relocated as part of this project. Additionally, a sanitary sewer stub will be installed through the west water quality basin to connect future development into the Lakeview Subdivision’s infrastructure.
- Future Schram Road Accommodation – The area slated for the future Schram Road ultimate profile will be graded from 204<sup>th</sup> Street to the right abutment of the north water quality basin. This will allow for seamless construction of Schram Road without the need to modify or affect the reservoir when the County and City construct the full Schram Road connection.

**1.A.7 When applicable include the geologic investigation required for the project (004.01 E 1);**

A geotechnical investigation and geotechnical design were conducted for preliminary design in 2018. Field investigation and laboratory testing were performed to characterize the subsurface conditions and provide physical property of the soils for analysis. Preliminary design was conducted to analyze seepage, settlement, seismic and stability in accordance with industry dam safety practices. The geotechnical report can be found in the feasibility and preliminary design report, Attachment A - WP-4 DR (HDR/JEO 2018).

**1.A.8 When applicable include the hydrologic data investigation required for the project (004.01 E 2);**

Hydrology information developed in the 2017 Papillion Creek Hydrologic Analysis (FYRA, 2017) was used in the design and evaluation of WP-4. The Papillion Creek Hydrologic Analysis looked at three separate rainfall distributions: 12-hr Local, 24-hr Hybrid, and 72-hr General. The objective of evaluating various rainfall distribution is to design for the rainfall distribution that produces the greatest runoff. Rainfall depths were gathered from NOAA Atlas 14 Point Precipitation Estimates for standard storm intervals. Rainfall depths used to define the Probable Maximum Precipitation (PMP) event were taken from the “Site-Specific Probable Maximum Precipitation (PMP) Study for Nebraska”. The Stability Design Hydrograph (SDH) and Freeboard Hydrograph (FBH)



rainfalls were determined using NRCS TR-60 criteria for a High Hazard structure (HDR/JEO 2018). The preliminary design phase showed that the 12-hr Local Storm distribution is to be used to set the auxiliary spillway crest and the 6-hr NRCS distribution is to be used to set the top of dam elevation. Table 5 below summarizes the design storms that were modeled and were used to hydraulically size the site in accordance with NDNR dam design criteria.

Table 5 Design Storm Information

Permanent Pool Elevation = 1223 ft			
		Elevation (ft)	Rainfall (in)
12-hr Local Storm	100 YR Peak	1229.31	6.63
	500 YR Peak	1231.79	8.93
	PMP/FBH Peak	1235.41	22.5
24-hr Hybrid Storm	100 YR Peak	1226.45	7.06
	500 YR Peak	1228.89	9.45
	PMP/FBH Peak	1234.51	24.0
5-PT 24-hr	PMP/FBH Peak	1235.19	24.0
6-hr NRCS	SDH Peak	1233.06	9.8
6-hr NRCS	FBH Peak	1235.62	20.5

- 1.A.9 When applicable include the criteria for final design including, but not limited to, soil mechanics, hydraulic, hydrologic, structural, embankments and foundation criteria (004.01 E 3).

Soil Mechanics

Laboratory testing was and will be conducted in accordance with ASTM criteria.

Hydrologic and Hydraulics

Hydrologic and hydraulic design was developed according to NRCS TR-60 criteria and the NRCS SITES model software. The SDH and FBH were used in the auxiliary spillway design and to set the top of dam elevation.

NRCS TR-60 criteria require the auxiliary spillway exit channel to be stable during the passage of a short duration event, modeled with the SDH. Furthermore, the auxiliary spillway also must not breach during the FBH event. A NRCS 6-hr storm duration was used for the short duration storm, and both the 6-hr NRCS and 12-hr Local Distributions were used for the FBH event.

Soils information from the Geotechnical Report was entered into the SITES model to perform a stability and integrity analysis on the auxiliary spillway. An NRCS developed spreadsheet was used to evaluate stability and the results show no anticipated erosion during the SDH event.

The integrity analyses showed that headcut caused during the FBH event would breach the structure if no additional measures were taken. Over-excavating and recompacting the top three (3) feet of material in the auxiliary spillway provided a design that would not breach the structure during passage of the 12-hr Local Distribution FBH event. See Appendix C, within the 60% Design Report, for further information on the auxiliary spillway integrity analysis.

#### Structural

Structural components will be designed in accordance with NRCS criteria as well as Nebraska Department of Transportation and other industry standards.

#### Embankments

Embankments were designed in accordance with NRCS criteria and industry standards.

#### Foundations

Foundations will be designed in accordance with NRCS criteria and industry standards.

If “NO”, it is considered mostly non-structural, so answer the following:

- 1.B.1 Insert data necessary to establish technical feasibility (004.02); N/A
- 1.B.2 Discuss the plan of development (004.02 A); N/A
- 1.B.3 Describe field or research investigations utilized to substantiate the project conception (004.02 B); N/A
- 1.B.4 Describe any necessary water and/or land rights (004.02 C); N/A
- 1.B.5 Discuss the anticipated effects, if any, of the project upon the development and/or operation of existing or envisioned structural measures including a brief description of any such measure (004.02 D). N/A

### **Prove Economic Feasibility**

(Applicant must demonstrate compliance with Title 261, CH 2 - 005)

- 2. Provide evidence that there are no known means of accomplishing the same purpose or purposes more economically, by describing the next best alternative.

Other structural alternatives to flood control, such as levees and channel widening, would require removal of existing structures, significant land acquisition, and extremely high construction costs. The P-MRNRD proactively planned WP-4 and construction does not

require demolition of existing residential or commercial property. The site has remained in agricultural use in anticipation of the construction of the reservoir. Non-structural alternatives, such as property buyout, did not meet the project’s purpose.

3. Document all sources and report all **costs** and **benefit data** using current data, (commodity prices, recreation benefit prices, and wildlife prices as prescribed by the Director) using both dollar values and other units of measurement when appropriate (environmental, social, cultural, data improvement, etc.). The period of analysis for economic feasibility studies is the project life, up to fifty (50) years; *or*, with prior approval of the Director up to one hundred (100) years, (Title 261, CH 2 - 005).

Pursuant to the WSF grant guidelines described in Title 261 – Rules Governing the Administration of the Water Sustainability Fund, primary tangible benefits were evaluated for comparison to the costs of the WP-4 project. Benefits considered in this analysis include flood damage reduction, recreation, and ecosystem services. The period used for the economic feasibility analysis was 50 years pursuant to the guidelines. The structure is estimated to have a project life of 100 years and provide flood protection for up to a 500-year flood event.

- 3.A Describe any relevant cost information including, but not limited to the engineering and inspection costs, capital construction costs, annual operation and maintenance costs, and replacement costs. Cost information shall also include the estimated construction period as well as the estimated project life (005.01).

Costs

A summary of the investment costs to complete WP-4 are provided in Table 6. The costs include engineering and design, permitting, land acquisition, construction services, and construction. The total investment cost in (2021 \$’s) with no inflation is approximately \$11.8 million dollars.

Table 6: WP-4 Investment Costs

<b>Tasks</b>	<b>Base Cost Estimate (2021 \$’s)</b>
Engineering Design & Bidding	\$634,000
Permitting	\$37,000
Other Professional Services (Administrative, Legal, Fiscal)	\$1,149,000
Land Acquisition	\$3,357,000
Engineering Construction Services	\$828,000
Construction	\$6,913,000
<b>Totals</b>	<b>\$12,918,000</b>
Average Annual Construction Costs (50 years, 4.04 % discount factor)	\$505,000
Annual Operations and Maintenance	\$20,000
<b>Total Average Annual Costs</b>	<b>\$525,000</b>

Investment costs will occur over 2 years or roughly \$6.5 million per year. Once completed, annual Operations and Maintenance (O&M) costs will be approximately \$20,000 per year. Total costs have been converted to average annual costs using a 50-year period of analysis and 4.04% discount factor based on the bond rate published from the NeDNR. Thus, the total estimated average annual cost for WP-4 is \$525,000.

- 3.B Only primary tangible benefits may be counted in providing the monetary benefit information and shall be displayed by year for the project life. In a multi-purpose project, estimate benefits for each purpose, by year, for the life of the project. Describe intangible or secondary benefits (if any) separately. In a case where there is no generally accepted method for calculation of primary tangible benefits describe how the project will increase water sustainability, in a way that justifies economic feasibility of the project such that the finding can be approved by the Director and the Commission (005.02).

Benefits

Pursuant to the WSF grant guidelines, primary tangible benefits were evaluated for comparison to the costs of the WP-4 project. Benefits considered in this analysis include flood damage reduction, recreation, and ecosystem services.

WP-4 will reduce damage to nine buildings on five residential properties immediately downstream of the basin and contribute to the collective effort to reduce the threat of flooding throughout the watershed. The total average annual flood damage reduction benefits are \$1.3 million (2021 dollars).

WP-4 will also provide environmental benefits by providing open space and riparian habitat. FEMA’s BCA toolkit provides monetary values for evaluating the primary tangible benefits from ecosystem services provided by these areas. Table 7 below illustrates the key inputs for the ecosystem services benefits estimates. In summary, the 47.9 acres of created habitat will provide \$1.2 Million in average annual benefit.

Table 7: Ecosystem Service Inputs

Input/Assumption	Units	Value	Source
Project Area (Acres)	Acres	47.9	JEO
Open Space (Acres)	Acres	26.9	JEO
Value of Open Space	\$/Acre/Year	\$8,308	FEMA BCA Toolkit
Riparian Habitat (Acres)	Acres	21	JEO
Percent Riparian Habitat	\$/Acre/Year	\$39,545	FEMA BCA Toolkit

Finally, recreation benefits were evaluated using an estimate of visitation and the monetary value of recreation as stipulated by Title 256: Regulations Governing the Administration of the Resources Development Fund. The base recreation value is \$8.33 per visitor per day (2014 dollars). This unit value was updated to March 2021 dollars using the Consumer Price Index (CPI) for evaluating the benefits of the WP-4 project. The adjusted value is \$9.43 per visitor per day.

Annual visitation was estimated by scaling the number of visitors from the Willow Creek State Recreation Area by acres of the normal pool.<sup>1</sup> The estimated annual visitation is 2,900 visitors per year. When combined with the unit value of visitation, the average annual value of recreation is \$26,000.

The total benefits are summarized below in Table 8. The average annual value of primary tangible benefits from WP-4 are \$2.5 Million per year.

Table 8: Summary of Total Benefits for WP-4 (2021 dollars)

Tasks	Average Annual \$'s
Flood Damage Reduction	\$1,273,000
Ecosystem Services	\$1,175,000
Recreation	\$26,000
<b>Total Benefits</b>	<b>\$2,474,000</b>

The computed benefit-cost ratio from the total annual costs and benefits shown above is \$4.72 per \$1 invested in the project over a 50-year project life for WP-4, or 4.72:1.

- 3.C Present all cost and benefit data in a table to indicate the annual cash flow for the life of the project (005.03).

Table 9 below presents the cash flow of discounted tangible benefits and project costs over the 50-year project life. The end of the table shows the total present value costs and benefits and the conversion to annual values. Construction is expected to take 2 years. The discounted capital costs occur in the first 2 years. Following the 2 years of construction, operations and maintenance costs and annual benefits accrue for the next 48 years.

Table 9: Project Cash Flow - Discounted Costs, Benefits, and Net Present Value

Project Year	Present Value Project Cost			Present Value Project Benefits				Total Net Present Value
	Capital Cost	Annual O&M	Total Costs	Flood damage reduction	Ecosystem services	Recreation	Total Benefits	
0	\$5,885,000	\$0	\$5,885,000	\$0	\$0	\$0	\$0	-\$5,885,000
1	\$5,656,000	\$0	\$5,656,000	\$0	\$0	\$0	\$0	-\$11,541,000
2	\$0	\$18,000	\$18,000	\$1,240,000	\$1,144,000	\$25,000	\$2,409,000	-\$9,150,000
3	\$0	\$18,000	\$18,000	\$1,192,000	\$1,100,000	\$24,000	\$2,316,000	-\$6,852,000
4	\$0	\$17,000	\$17,000	\$1,145,000	\$1,057,000	\$23,000	\$2,225,000	-\$4,644,000
5	\$0	\$16,000	\$16,000	\$1,101,000	\$1,016,000	\$22,000	\$2,139,000	-\$2,521,000
6	\$0	\$16,000	\$16,000	\$1,058,000	\$976,000	\$21,000	\$2,055,000	-\$482,000
7	\$0	\$15,000	\$15,000	\$1,017,000	\$938,000	\$20,000	\$1,975,000	\$1,478,000

<sup>1</sup> Source: Thompson, E. and Herian, M. "The Economic and Property Value Impact of the Willow Creek State Recreational Area," February 2020, prepared for JEO and Lower Elkhorn Natural Resources District.

Project Year	Present Value Project Cost			Present Value Project Benefits				Total Net Present Value
	Capital Cost	Annual O&M	Total Costs	Flood damage reduction	Ecosystem services	Recreation	Total Benefits	
8	\$0	\$15,000	\$15,000	\$978,000	\$902,000	\$20,000	\$1,900,000	\$3,363,000
9	\$0	\$14,000	\$14,000	\$940,000	\$867,000	\$19,000	\$1,826,000	\$5,175,000
10	\$0	\$13,000	\$13,000	\$903,000	\$833,000	\$18,000	\$1,754,000	\$6,916,000
11	\$0	\$13,000	\$13,000	\$868,000	\$801,000	\$17,000	\$1,686,000	\$8,589,000
12	\$0	\$12,000	\$12,000	\$834,000	\$770,000	\$17,000	\$1,621,000	\$10,198,000
13	\$0	\$12,000	\$12,000	\$802,000	\$740,000	\$16,000	\$1,558,000	\$11,744,000
14	\$0	\$11,000	\$11,000	\$771,000	\$711,000	\$15,000	\$1,497,000	\$13,230,000
15	\$0	\$11,000	\$11,000	\$741,000	\$684,000	\$15,000	\$1,440,000	\$14,659,000
16	\$0	\$11,000	\$11,000	\$712,000	\$657,000	\$14,000	\$1,383,000	\$16,031,000
17	\$0	\$10,000	\$10,000	\$684,000	\$632,000	\$14,000	\$1,330,000	\$17,351,000
18	\$0	\$10,000	\$10,000	\$658,000	\$607,000	\$13,000	\$1,278,000	\$18,619,000
19	\$0	\$9,000	\$9,000	\$632,000	\$583,000	\$13,000	\$1,228,000	\$19,838,000
20	\$0	\$9,000	\$9,000	\$608,000	\$561,000	\$12,000	\$1,181,000	\$21,010,000
21	\$0	\$9,000	\$9,000	\$584,000	\$539,000	\$12,000	\$1,135,000	\$22,136,000
22	\$0	\$8,000	\$8,000	\$561,000	\$518,000	\$11,000	\$1,090,000	\$23,218,000
23	\$0	\$8,000	\$8,000	\$540,000	\$498,000	\$11,000	\$1,049,000	\$24,259,000
24	\$0	\$8,000	\$8,000	\$519,000	\$479,000	\$10,000	\$1,008,000	\$25,259,000
25	\$0	\$7,000	\$7,000	\$499,000	\$460,000	\$10,000	\$969,000	\$26,221,000
26	\$0	\$7,000	\$7,000	\$479,000	\$442,000	\$10,000	\$931,000	\$27,145,000
27	\$0	\$7,000	\$7,000	\$461,000	\$425,000	\$9,000	\$895,000	\$28,033,000
28	\$0	\$7,000	\$7,000	\$443,000	\$408,000	\$9,000	\$860,000	\$28,886,000
29	\$0	\$6,000	\$6,000	\$426,000	\$393,000	\$9,000	\$828,000	\$29,708,000
30	\$0	\$6,000	\$6,000	\$409,000	\$377,000	\$8,000	\$794,000	\$30,496,000
31	\$0	\$6,000	\$6,000	\$393,000	\$363,000	\$8,000	\$764,000	\$31,254,000
32	\$0	\$6,000	\$6,000	\$378,000	\$349,000	\$8,000	\$735,000	\$31,983,000
33	\$0	\$5,000	\$5,000	\$363,000	\$335,000	\$7,000	\$705,000	\$32,683,000
34	\$0	\$5,000	\$5,000	\$349,000	\$322,000	\$7,000	\$678,000	\$33,356,000
35	\$0	\$5,000	\$5,000	\$336,000	\$310,000	\$7,000	\$653,000	\$34,004,000
36	\$0	\$5,000	\$5,000	\$323,000	\$298,000	\$6,000	\$627,000	\$34,626,000
37	\$0	\$5,000	\$5,000	\$310,000	\$286,000	\$6,000	\$602,000	\$35,223,000
38	\$0	\$4,000	\$4,000	\$298,000	\$275,000	\$6,000	\$579,000	\$35,798,000
39	\$0	\$4,000	\$4,000	\$286,000	\$264,000	\$6,000	\$556,000	\$36,350,000
40	\$0	\$4,000	\$4,000	\$275,000	\$254,000	\$6,000	\$535,000	\$36,881,000
41	\$0	\$4,000	\$4,000	\$265,000	\$244,000	\$5,000	\$514,000	\$37,391,000
42	\$0	\$4,000	\$4,000	\$254,000	\$235,000	\$5,000	\$494,000	\$37,881,000
43	\$0	\$4,000	\$4,000	\$244,000	\$226,000	\$5,000	\$475,000	\$38,352,000
44	\$0	\$4,000	\$4,000	\$235,000	\$217,000	\$5,000	\$457,000	\$38,805,000
45	\$0	\$3,000	\$3,000	\$226,000	\$208,000	\$5,000	\$439,000	\$39,241,000
46	\$0	\$3,000	\$3,000	\$217,000	\$200,000	\$4,000	\$421,000	\$39,659,000
47	\$0	\$3,000	\$3,000	\$209,000	\$192,000	\$4,000	\$405,000	\$40,061,000

Project Year	Present Value Project Cost			Present Value Project Benefits				Total Net Present Value
	Capital Cost	Annual O&M	Total Costs	Flood damage reduction	Ecosystem services	Recreation	Total Benefits	
48	\$0	\$3,000	\$3,000	\$201,000	\$185,000	\$4,000	\$390,000	\$40,448,000
49	\$0	\$3,000	\$3,000	\$193,000	\$178,000	\$4,000	\$375,000	\$40,820,000
Total	\$11,541,000	\$403,000	\$11,944,000	\$27,160,000	\$25,059,000	\$545,000	\$52,764,000	\$40,820,000
Annualized	\$541,000	\$19,000	\$560,000	\$1,273,000	\$1,175,000	\$26,000	\$2,474,000	\$1,914,000

- 3.D In the case of projects for which there is no generally accepted method for calculation of primary tangible benefits and if the project will increase water sustainability, demonstrate the economic feasibility of such proposal by such method as the Director and the Commission deem appropriate (005.04). (For example, show costs of and describe the next best alternative.)

Not applicable. As noted above primary tangible benefits have been documented and presented along with the project performance metrics.

**Prove Financial Feasibility**

(Applicant must demonstrate compliance with Title 261, CH 2 - 006)

4. Provide evidence that sufficient funds are available to complete the proposal.

P-MRNRD’s Board of Directors approved the implementation plan for the Papillion Creek Watershed, including this project, on May 19, 2019, and the Board committed to funding the local share of this project. The Board also approved the submission of this application on July 8, 2021. Construction is anticipated to begin in Fiscal Year 2022 and these funds will be available for the duration of the project. Letters of support and financial assistance are provided in Attachment B – Letters of Support. P-MRNRD has confirmed that funding is available in their respective budgets for the 2021 calendar year.

5. Provide evidence that sufficient annual revenue is available to repay the reimbursable costs and to cover OM&R (operate, maintain, and replace).

Papio-Missouri River Natural Resources District (P-MRNRD)

The P-MRNRD has estimated the 2021-2022 property tax request at 0.035846 cents per \$100 of valuation. This request indicates \$28,072,189 will be available from property taxes, contributing towards a total operating budget of \$83,837,482.

City of Gretna

The City of Gretna is contributing \$29,900 of the project total towards design of transportation and sanitary sewer elements. The City Parks and Recreation Department will be solely responsible for the annual Operation and Maintenance of the recreation area and will cover all expenses as part of its operating budget. O&M costs are estimated to be \$20,000 per year.

Sarpy County

Sarpy is contributing \$500,000 of the project total for construction of an embankment across the north water quality basin to support the future Schram Road expansion. Future Schram Road construction will be a separate project.

6. If a loan is involved, provide sufficient documentation to prove that the loan can be repaid during the repayment life of the proposal.

N/A

7. Describe how the plan of development minimizes impacts on the natural environment (i.e. timing vs nesting/migration, etc.).

Numerous design alternatives for the WP-4 project were screened in the PCWMP and were refined in the Section 404 permitting process to avoid significant environmental impacts. As of June 2021, the Individual Permit (IP) process is near completion and the impacts are considered relatively small. The USACE IP process ensures that the Least Environmentally Damaging Practicable Alternative (LEDPA) is selected, in compliance with the Clean Water Act Section 404(b)(1).

Stream assessments of waterways within the project area were conducted according to the methods and procedures outlined in the USACE Nebraska Stream Condition Assessment Procedure (NeSCAP). The procedure involved reviewing available published resources and conducting field assessments to evaluate the physical and biological attributes of the reach of Wehrspann Creek impacted by the project. The studies found that downstream Wehrspann Creek channel reaches degrade moving downstream because they become deeply incised and then are disconnected from the floodplain. The streambanks are also heavily eroded and appear to be frequently disturbed (HDR/JEO 2018).

The same assessment methodology was applied to future (post-project) conditions to determine how the project could impact stream health and function. This analysis found that the project will cause a net increase in the stream functionality of Wehrspann Creek within the project area. Specifically, there will be an overall increase in habitat stability and improvements to riparian buffer communities and decreases in erosion will increase aquatic functions. The reservoirs will create both deep and shallow open water habitat, inundated wetlands, and emergent wetland/mesic tallgrass prairie transition zones. Tree and shrub dominated areas may also develop with the buffer zone by natural colonization or may be promoted with plantings in designated areas.

8. Explain how you are qualified, responsible and legally capable of carrying out the project for which you are seeking funds.

The P-MRNRD has authority under Neb. Rev. Stat. 2-3229 for erosion prevention and control, soil conservation, and management of water supplies for beneficial uses. Neb. Rev. Stat. 2-3230 and 2-3232 allows the NRDs to develop facilities, works, studies, and complete demonstration projects that further the purposes of the District.



9. Explain how your project considers plans and programs of the state and resources development plans of the political subdivisions of the state.

As previously described, the construction of WP-4 is part of the PCWMP, a collaborative effort to reduce flood threats from the Papillion Creek and its tributaries by nine entities, that was created in 2009. P-MRNRD and PCWP have been actively leading implementation of the PCWMP since 2009. Construction of WP-4 contributes to the shared goal of NeDNR and P-MRNRD to reduce flood threats.

Also listed in the Annual Report are the Statewide activities describe Water Sustainability Fund goals. This project fits multiple goals stated in the document:

- Contribute to multiple water supply management goals including flood control, reducing threats to property damage, agricultural uses, municipal and industrial uses, recreational benefits, wildlife habitat, conservation, and preservation of water resources.

The benefits of this project and how it achieves these goals are described in detail below:

#### Flood Control

The primary purposes of this dam site are flood control and water quality improvements as identified in the PCWMP. The reservoir will attenuate flood flows through a 48” diameter principal spillway pipe, storing flood flows in the reservoir. They are designed to maximize flood reduction benefits in a rapidly developing watershed. Over 20 existing structures and actively developing areas will be protected immediately downstream by WP-4 as seen in Figure 4.

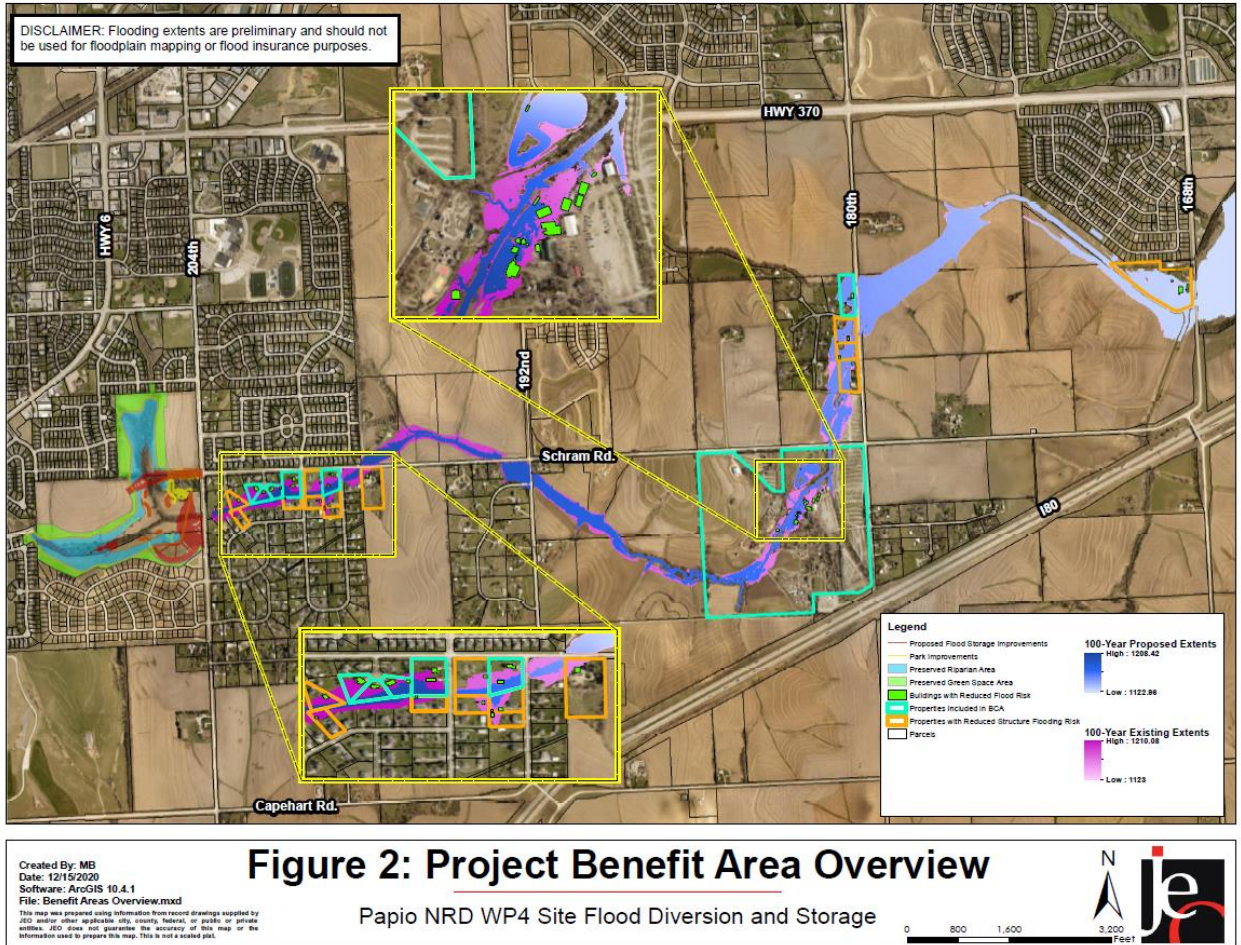


Figure 4: Project Benefit Area

Recreation

The proposed project components provide numerous recreational opportunities, wildlife habitat, and water resource conservation and preservation benefits including an increase of 26.0 riparian acres (JEO 2018). Reservoirs create multiple recreational opportunities near Nebraska’s largest population base including fishing, boating, canoeing, wildlife viewing, hiking, and picnicking. While all existing flood control reservoir day use facilities provide a diversity of public use amenities, it is appropriate for WP-4 to provide similar uses as provided at our P-MRNRD constructed damsites. Primary programmed uses for WP-4 focus on the recreation trail use, picnicking, fishing, kayak ramp and boat ramp water access.

Water Quality

Water quality basins upstream of the reservoir can have a major impact on reservoir sustainability and consequently, the WP-4 project will contribute to the overall health of the watershed. The primary function of a water quality basin is to trap sediment upstream of a reservoir and prevent transport of this material into the main water body. This concentrates material into a smaller, more manageable location and prevents reduction of the water volume in the reservoir, which is beneficial to maintaining water quality and

planned lake depths. Pollutant load reductions can be expected, specifically those such as phosphorus because of its affinity to adhere to sediment particles that will settle out.

A few additions will be incorporated into the basin design to improve the basin’s function. Additional earthwork grading that increases storage capacity, the creation of wetlands and increasing the surface area will collectively improve the basin’s performance.

Wildlife Habitat

The reservoir will create diverse deep and shallow aquatic habitats for a variety of aquatic organisms and birds and will be managed as a fishery in cooperation with NGPC. The ecosystem services benefits were established in 2021 as part of a benefit-cost analysis (Attachment C) created for a potential FEMA grant and is shown in Figure 5.

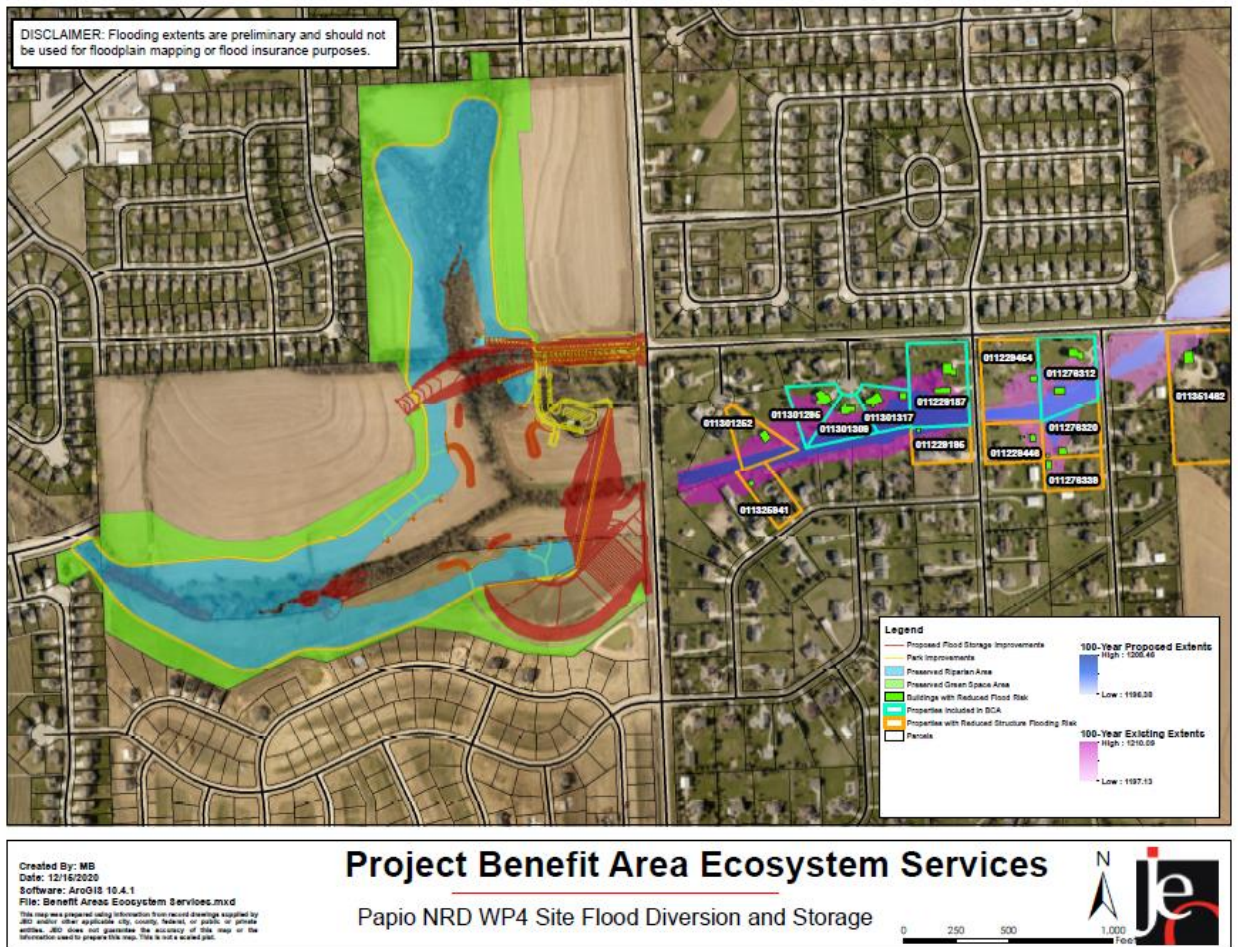


Figure 5: Ecosystem Services Benefits

10. Are land rights necessary to complete your project? YES  NO

If yes:

10.A Provide a complete listing of all lands involved in the project.

Site WP-4 will encompass an estimated 81.3 acres, as shown in Table 10. The P-MRNRD does not currently own all this property but have already initiated communication with the landowners regarding the land acquisition process. The proactive planning principles implemented as part of the PCWMP allowed for the reservation of open space to build retention ponds such as WP-4. All landowners are aware of the project and at this time are anticipated to be willing sellers to this project and the planned developments surrounding the project.

Table 10: WP-4 Land Rights Acquisitions

Parcel ID	Current Owner	Total Project Area (acres)	Unit Cost	Cost	Status
011114622 & 010394664	TMG 1, LLC	58.16	\$55,000	\$3,198,800.00	To be purchased
010411003	Kindbeiter	1.80	\$55,000	\$99,000.00	To be purchased
011588188	Papio NRD	20.27	\$0,000	\$0	Owned by NRD
011583248	SID 250	0.29	\$55,000	\$15,950.00	NRD to obtain easement
011594614	Oakwood Homes of NE, LLC	0.78	\$55,000	\$42,900.00	NRD to obtain easement
<b>Total</b>		<b>81.3</b>		<b>\$3,356,650</b>	

10.B Attach proof of ownership for each easements, rights-of-way and fee title currently held.

Proof of ownership for parcel ID 011588188, owned by P-MRNRD, is provided in Attachment D – Supplementation Information. As previously mentioned, the P-MRNRD remains engaged with current property owners to purchase or obtain easements for the other property.

10.C Provide assurance that you can hold or can acquire title to all lands not currently held.

P-MRNRD regularly works through property acquisition to construct projects. They are currently in discussions with four landowners for acquisition or easements. All landowners are anticipating the sale and to date have not indicated unwillingness to sell. P-MRNRD has the authority to use eminent domain, if necessary, to ensure the Project is completed as planned.

11. Identify how you possess all necessary authority to undertake or participate in the project.

Nebraska Revised Statute, Chapter 2, 3203, describes the primary objectives of NRDs, including to “provide effective coordination, planning, development and general management of areas which have related resources problems.” This project falls directly in line with the roles and responsibilities of the P-MRNRD. The P-MRNRD will obtain all necessary permits and land rights to complete the project to obtain the authority needed to perform work on their own property. Furthermore, the NRDs have taxing authority.

12. Identify the probable consequences (environmental and ecological) that may result if the project is or is not completed.

Once completed, the Project will considerably improve the environmental and ecological functions within the drainage basin because of the permanent pool and surrounding riparian area. Additionally, water quality basins immediately upstream of the reservoir will improve the reservoir’s long-term sustainability. The primary function of a water quality basin is to trap sediment upstream of the reservoir and prevent transport of this material into the main body. Like reservoirs, the water quality basins can also attenuate water, providing additional die off time for bacteria. Any increase in surface area provided by the water quality basin provides more ultraviolet light exposure that kills bacteria.

Numerous design alternatives were screened in the PCWMP but were later refined in the Section 404 permitting process to avoid, minimize, and mitigate environmental impacts. The Section 404 permitting process for WP-4 is under USACE review and a permit is anticipated in late 2021.

A few additions have been incorporated into the basin design to improve the basin’s function. Additional earthwork grading that increases storage capacity and the creation of wetlands and increasing the surface area will collectively improve the basin’s performance.

The project will significantly improve stream health and function. Specifically, there will be an overall increase in stream habitat stability, improvements to riparian buffer communities and decreases in erosion will increase aquatic functions. Riparian wetlands may also develop within the buffer zone by natural colonization or promoted with plantings in designated areas.

Should the project not be completed, the land and stream would become urbanized and continue to deteriorate as runoff from development increases. As development is inevitable, constructing the WP-4 project allows development to occur in a sustainable manner by simultaneously providing aquatic habitats, improving stream health, and providing healthful recreational opportunities for residents within the watershed.



## Section C.

### NRC SCORING

In the NRC's scoring process, points will be given to each project in ranking the projects, with the total number of points determining the final project ranking list.

The following 15 criteria constitute the items for which points will be assigned. Point assignments will be 0, 2, 4, or 6 for items 1 through 8; and 0, 1, 2, or 3 for items 9 through 15. Two additional points will be awarded to projects which address issues determined by the NRC to be the result of a federal mandate.

#### Notes:

- The responses to one criterion *will not* be considered in the scoring of other criteria. Repeat references as needed to support documentation in each criterion as appropriate. The 15 categories are specified by statute and will be used to create scoring matrixes which will ultimately determine which projects receive funding.
- There is a total of 69 possible points, plus two bonus points. The potential number of points awarded for each criteria are noted above. Once points are assigned, they will be added to determine a final score. The scores will determine ranking.
- The Commission recommends providing the requested information and the requests are not intended to limit the information an applicant may provide. An applicant should include additional information that is believed will assist the Commission in understanding a proposal so that it can be awarded the points to which it is entitled.

Complete any of the following (15) criteria which apply to your project. Your response will be reviewed and scored by the NRC. Place an N/A (not applicable) in any that do not apply, an N/A will automatically be placed in any response fields left blank.

1. Remediates or mitigates threats to drinking water;
  - Describe the specific threats to drinking water the project will address.
  - Identify whose drinking water, how many people are affected, how will project remediate or mitigate.
  - Provide a history of issues and tried solutions.
  - Provide detail regarding long-range impacts if issues are not resolved.

The embankment of a stormwater detention structure provides grade control and stabilizes the stream thereby reducing threats to infrastructure including stormwater pipes, drinking water lines, and sanitary sewer lines. Grade control provides grade stabilization and reduces stream bank erosion. For example, Figure 6 illustrates the threats to infrastructure and property caused by a lack of grade control. Severe streambank erosion is common in urbanizing areas where the streambed becomes

unstable and head cutting migrates upstream unless grade control and/or streambank stabilization projects are proactively planned before or during the urban development process. Constructing WP-4 will not require relocating existing drinking water infrastructure, nor is it anticipated to pose a problem when constructing drinking water infrastructure as the area develops.



Figure 6: Severe Stream Degradation, Erosion, and a Failed Sanitary Sewer in Omaha

Improving the health of the watershed and providing a natural area to trap sediments, nutrients, and bacteria are other benefits of detention structures. While no area specific issues have been documented, developed areas do see increases in impermeable surfaces and runoff will often carry automotive oils and fluids which will pollute streams. If not removed, these pollutants can accumulate and damage both aquatic life and the overall health of riparian areas. Because WP-4 will be located in an urban area, pollutants will be trapped and not transferred downstream.

2. Meets the goals and objectives of an approved integrated management plan or ground water management plan;
  - Identify the specific plan that is being referenced including date, who issued it and whether it is an IMP or GW management plan.
  - Provide the history of work completed to achieve the goals of this plan.
  - List which goals and objectives of the management plan the project provides benefits for and how the project provides those benefits.

P-MRNRD's first Integrated Management Plan (IMP) was developed in 2014 and jointly adopted by the P-MRNRD and the Nebraska Department of Natural Resources (NDNR). This project supports Goal #1 – "Develop and implement water use policies and practices



that contribute to the protection of existing surface and groundwater uses while allowing for future water development.” WP-4 is a development of an existing water resource that will protect downstream water and groundwater uses. The reservoir will naturally recharge groundwater and contribute to a steady baseflow downstream.

WP-4 is part of the 2009 PCWMP issued by the Papillion Creek Watershed Partnership. The PCWMP was most recently revised in 2019. WP-4 supports P-MRNRD four of the watershed management policies outlined in the PCWMP:

- 1) Improve water quality from all contributing sources,
- 2) Reduce stormwater peak discharge during development and after full build-out land use conditions,
- 3) Preserve, restore, and conserve landscapes for recreational opportunities and pollutant reduction and
- 4) Provide erosion and sediment control through storing sediment.

In the 2019 update of the PCWMP, WP-4 was scheduled for construction for the FY 2020 to FY 2024 provided funding is available. WP-4 will continue to improve water quality within the drainage basin by creating a reservoir that will serve as a regional detention basin providing flood control for several developments. Because the dam will collect water regionally, this will enable the remaining 20% of the watershed to be developed and the increased runoff to be regulated and treated. The reservoir will also provide recreational activities with a pedestrian trail circling the reservoir pool and a public access area with parking and water access. Areas surrounding the reservoir will be preserved as greenspace and not subject to development. Finally, the water quality basins and main dam will trap sediment and prevent the sediment from being transported downstream.

3. Contributes to water sustainability goals by increasing aquifer recharge, reducing aquifer depletion, or increasing streamflow;

List the following information that is applicable:

- The location, area and amount of recharge;
- The location, area and amount that aquifer depletion will be reduced;
- The reach, amount and timing of increased streamflow. Describe how the project will meet these objectives and what the source of the water is;
- Provide a detailed listing of cross basin benefits, if any.

Construction of WP-4 will create a 15.4-acre permanent pool and become part of the hydrologic process of the watershed and local water cycle, capturing and storing surface water that will naturally recharge the local aquifer. Water stored in the aquifer can be discharged back into a stream or pumped by private or municipal wells in the area.

The reservoir will also increase streamflow by slowly releasing a steady stream of water rather than pulses of runoff after a heavy rain. The source of water is from Wehrspann

Creek, a tributary to South Papillion Creek, which flows into Wehrspann Lake several miles downstream.

By storing water and releasing it slowly, the risk of flood damage to downstream properties is reduced. Furthermore, because development increases streamflow volumes and flood volumes to above their pre-development levels, controlling streamflow using a dam and reservoir will help maintain streamflow rates closer to its natural fluctuations. Even as surrounding land is developed, riparian habitats can be maintained and enhanced. By increasing groundwater infiltration, regulating streamflow, and reducing the risk of flood damage, constructing WP-4 can help meet the water sustainability goals of Eastern Nebraska.

4. Contributes to multiple water supply goals, including, but not limited to, flood control, agricultural use, municipal and industrial uses, recreational benefits, wildlife habitat, conservation of water resources, and preservation of water resources;
  - List the goals the project provides benefits.
  - Describe how the project will provide these benefits
  - Provide a long range forecast of the expected benefits this project could have versus continuing on current path.

Construction of WP-4 was part of the 2009 PCWMP which was created to reduce the threat of flooding from the Papillion Creek and its tributaries, such as Wehrspann Creek. P-MRNRD has been actively leading implementation of the PCWM Plan and completed construction of WP-6 and WP-7 in the summer of 2021 and will begin construction of WP-1 in the fall of 2021 or early 2022. WP-4 achieves goals of flood control, recreation benefits, wildlife habitat, water quality, conservation of water resources, and preservation of water resources.

In the NDNR's Annual Report and Plan of Work for the Nebraska State Water Planning and Review Process (hereafter referred to as the Annual Report) (NDNR 2020), the Statewide activities describe Water Sustainability Fund goals. This project fits multiple goals stated in the document and also listed in the question above. The benefits of this project and how it achieves these goals are described in detail below:

#### Flood Control

Since its formation in 2001, the PCWP has been working on improved stormwater and floodplain management. The watershed covers 402 square miles of Nebraska's most densely populated area extending from Washington County southward through Douglas and Sarpy counties. PCWP members consist of the cities of Bellevue, Bennington, Boys Town, Gretna, La Vista, Omaha, Papillion, and Ralston; Sarpy County; and P-MRNRD.

Major storm events pose a significant flooding threat because agricultural lands have been converted to developed spaces. The PCWP seeks to implement appropriate surface runoff control measures to not only keep pace with such growth, but to also reduce peak

flows and to improve water quality. The 2009 PCWMP provided a strategy to construct a combination of regional detention basins, water quality basins and Low Impact Development (LID) strategies.

In 2009, a total of 12 proposed water quality basins have been defined upstream of regional detention basins (9 sites upstream of existing regional detention sites and 3 sites upstream of potential regional detention basins). As of the summer of 2021, five water quality basins, ZB-1, ZB-2, two located upstream of WP-5, and one located upstream of DS 15A, have been constructed.

In 2009, a suite of 15 regional detention basins were screened for relative performance effectiveness and implementation priority/scheduling. Fourteen sites were approved, and another site was determined not viable, so only 13 sites remain in the plan. Regional detention has the advantage of addressing stormwater management on a regional basis rather than at a centralized or specific site. This allows for larger structures to be managed more effectively and provides greater benefits to a region. These regional detention basins provide the greatest flood damage reduction when constructed prior or in conjunction with development. As of the summer of 2021, four detention basins, DS 15A, WP-5, WP-6, and WP-7 have been constructed. WP-6 and WP-7, which completed construction in 2021, were previously funded by WSF. Construction on WP-1 is anticipated to be completed in 2023.

WP-4 is one of the originally planned 15 structures that, once constructed, will contribute to collective flood control benefits throughout the watershed by protecting homes, businesses, industries, and providing additional benefits of water quality improvement, streambank stabilization, and recreational opportunities. A status of the full build-out conditions as of April 2019 are shown in Figure 1.

The location of WP-4, in relation to other structures in the area, is shown in Figure 7

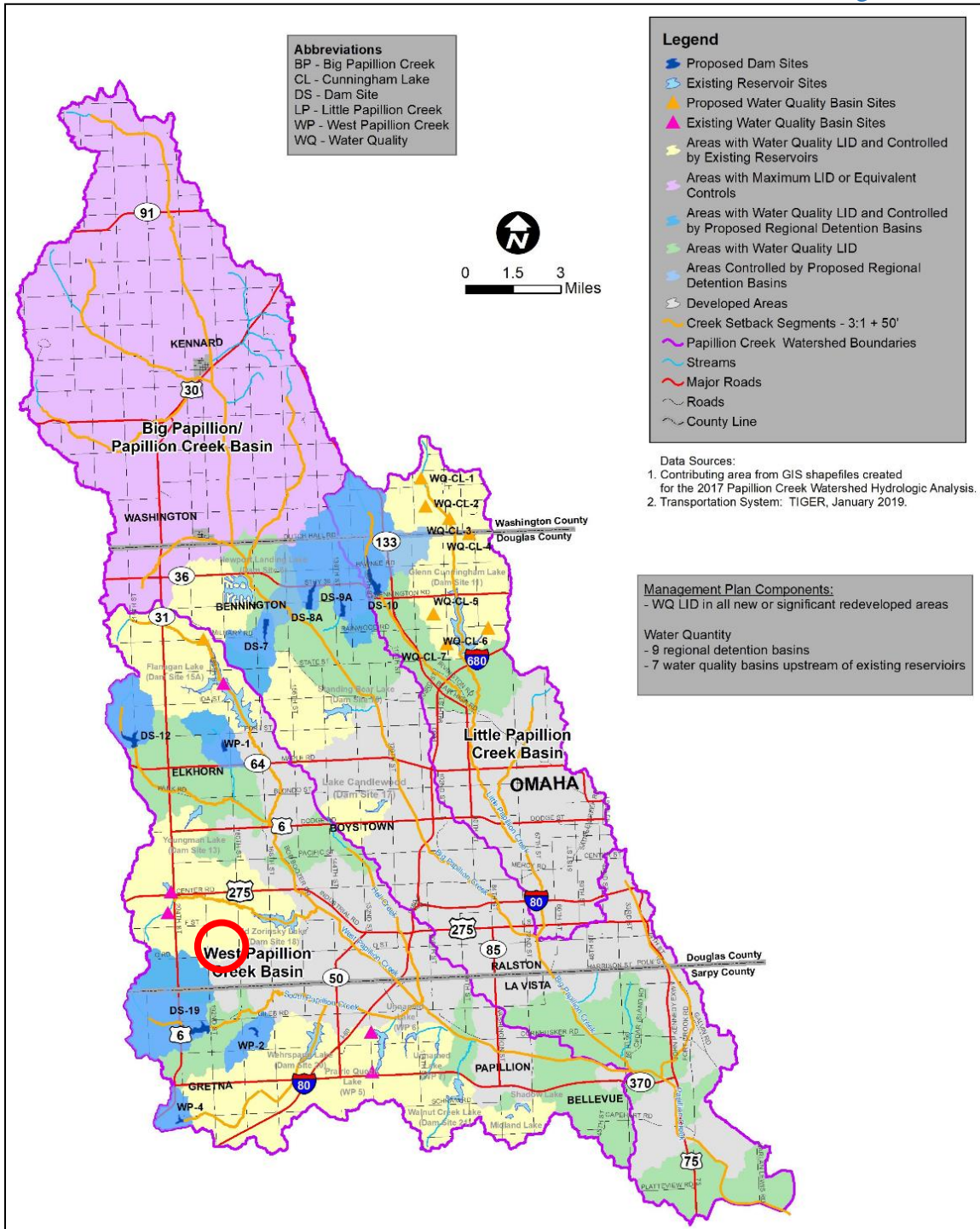


Figure 7: Papillion Creek Watershed and Watershed Management Plan Elements

Figure 8 shows how over 20 existing structures and actively developing areas located immediately downstream of WP-4 will be protected by the project. Specifically, the reservoir will attenuate flood flows by releasing water downstream through a 48”

diameter principal spillway pipe and storing flood flows in the reservoir. In this way, the WP-4 project and similar projects already under construction, are designed to maximize flood reduction benefits in a rapidly developing watershed.

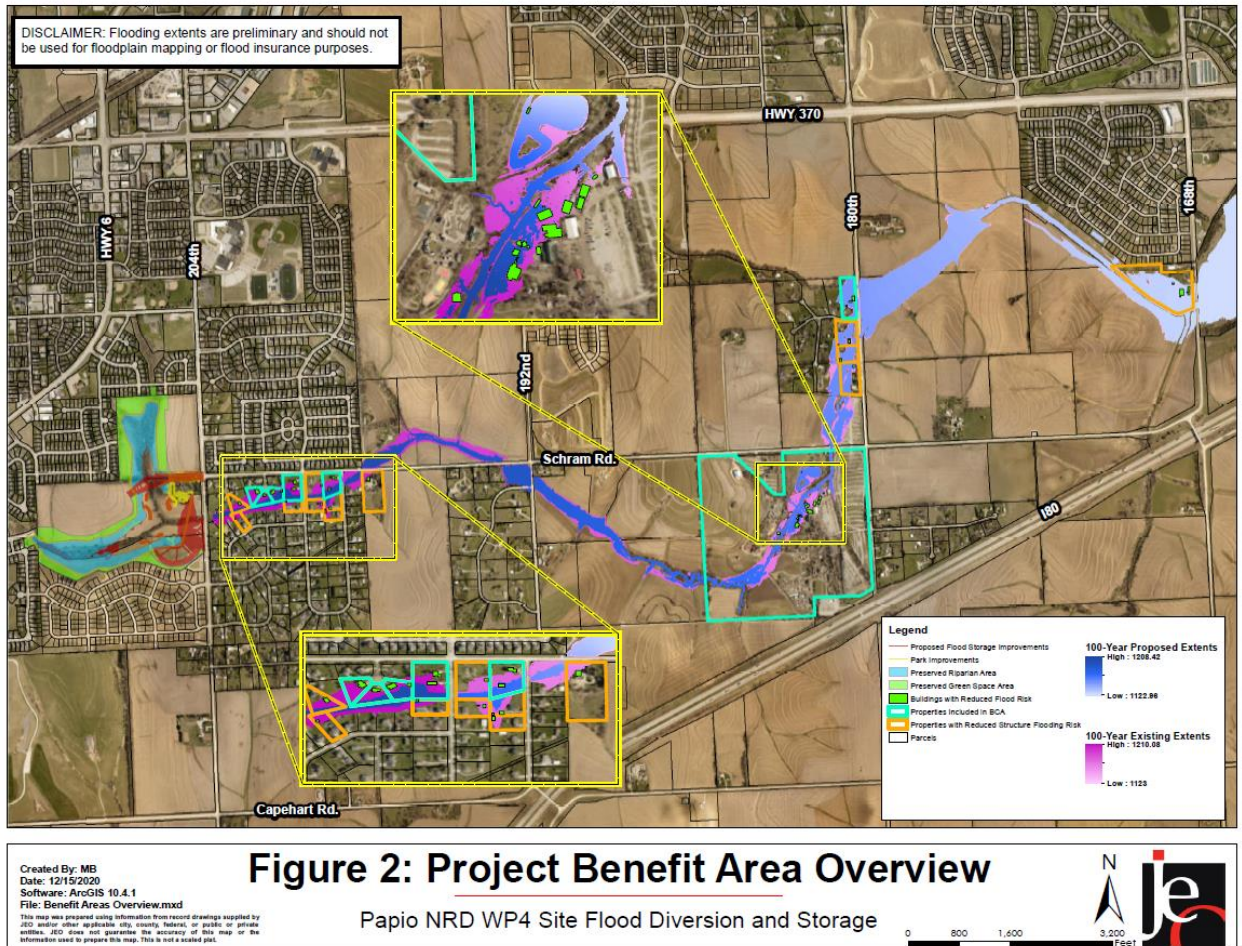


Figure 8: WP-4 Project Benefit Area along Wehrspann Creek

### Recreation

The proposed project components provide numerous recreational opportunities, wildlife habitats, and water resource conservation and preservation benefits including an increase of 26 acres of riparian habitat (JEO 2018). Reservoirs, such as the one created by the WP-4 project, create multiple recreational opportunities near Nebraska’s largest population base including fishing, boating, canoeing, wildlife viewing, hiking, and picnicking. Some of the constructed flood control reservoir day use facilities provide a diversity of public use amenities and because WP-4 will be located in an urban area, it is appropriate for WP-4 to provide similar uses. Primary programmed uses for WP-4 focus upon hiking/bicycling trail use, picnicking, shoreline fishing, and boat ramp water access.

### Water Quality

Water quality basins upstream of the reservoir, such as the two included in this project, will have a positive impact on reservoir sustainability. The primary function of a water quality basin is to trap sediment upstream of the reservoir and prevent transport of this material into the main body. This concentrates the material into a smaller, more manageable location and prevents reduction of the water volume in the reservoir, which is beneficial to maintaining water quality and planned lake depths. Pollutant load reductions can be expected, specifically pollutants such as phosphorus which has the affinity to adhere to sediment particles that will settle out and then can be removed from the basins.

A few additions have been incorporated into the design to improve the detention basin's function. Additional earthwork grading in the pool area will increase storage capacity and provide variation in depths to support a viable fishery, the creation of wetlands along the reservoir shoreline, and increasing the reservoir's surface area will collectively improve the basin's performance.

### Wildlife Habitat

The reservoir will create both deep and shallow aquatic habitats for a variety of aquatic organisms and birds and will be managed as a fishery in cooperation with NGPC. The ecosystem services benefits were established in 2021 as part of a benefit-cost analysis and are shown in Figure 9

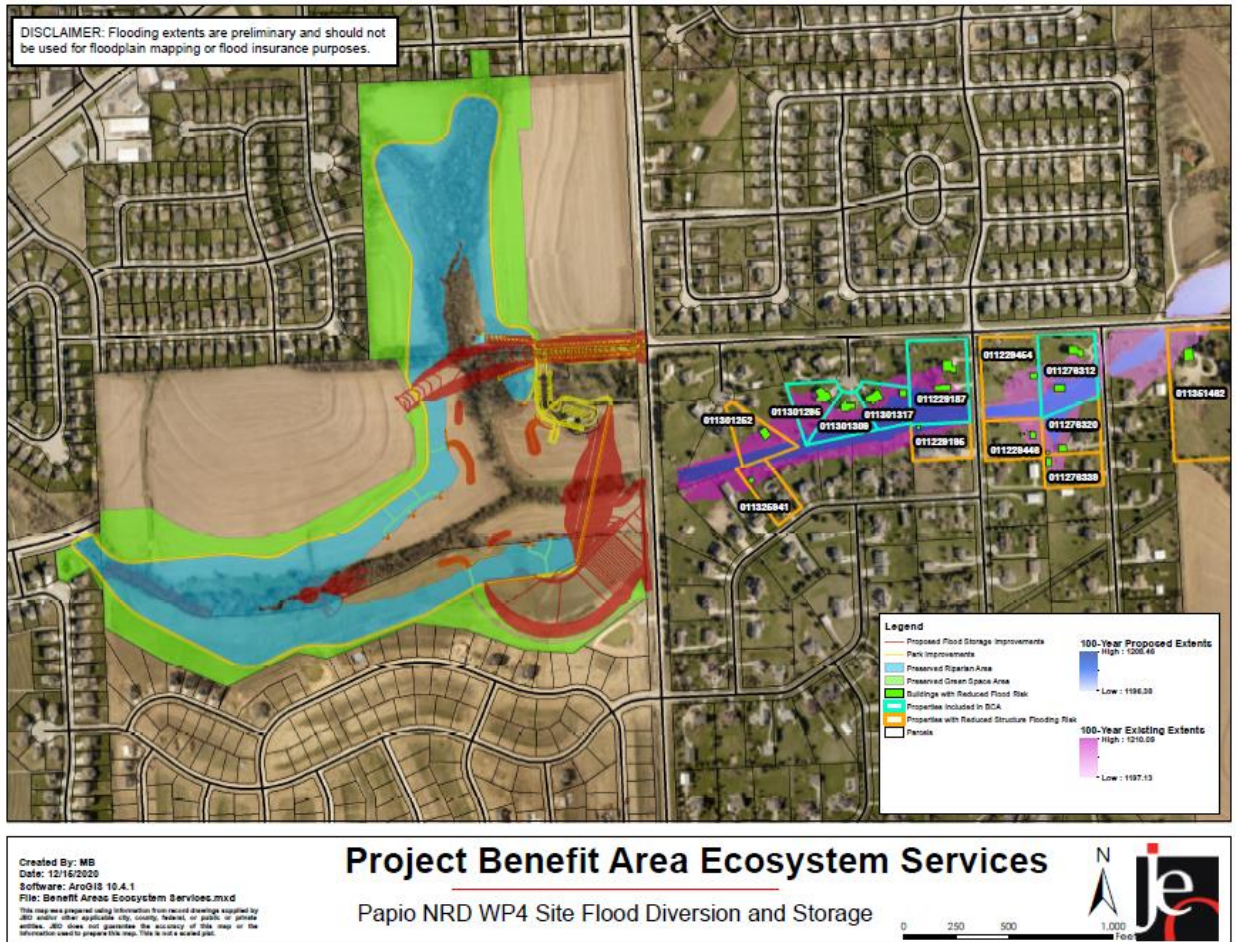


Figure 9: WP-4 Ecosystem Services Benefits

5. Maximizes the beneficial use of Nebraska’s water resources for the benefit of the state’s residents;
  - Describe how the project will maximize the increased beneficial use of Nebraska’s water resources.
  - Describe the beneficial uses that will be reduced, if any.
  - Describe how the project provides a beneficial impact to the state's residents.

WP-4 is one of the originally planned 15 structures that, once constructed, will provide collective flood control benefits throughout the watershed. These structures will protect homes, businesses, industries, and provide the additional benefits of water quality improvement, streambank stabilization, and recreational opportunities within Nebraska’s most populous area. The dam project will also preserve 26.9-acres of riparian area and 21-acres of additional open-greenspace will be created in addition to the creation of a new fishery. There will be a 10-foot wide pedestrian trail 1.8 miles in length, an access area with parking for vehicles and boat trailers, and potable water, picnic shelter and toilets. This multi-purpose structure will increase the beneficial use of Wehrspann Creek by create a permanent pool and adding recreational beneficial use. This area will become

an attraction for recreationalists and improve the economy for the local area by bringing people to the area.

6. Is cost-effective;

- List the estimated construction costs, O/M costs, land and water acquisition costs, alternative options, value of benefits gained.
- Compare these costs to other methods of achieving the same benefits.
- List the costs of the project.
- Describe how it is a cost effective project or alternative.

Pursuant to the WSF grant guidelines, primary tangible benefits were evaluated for comparison to the costs of the WP-4 project. Benefits considered in this analysis include flood damage reduction, recreation, and ecosystem services. As described in Section B, Question 2, WP-4 is cost effective returning a Benefit to Cost Ratio of 4.72:1. The project benefits include flood damage reduction (\$1,273,000), ecosystem services (\$1,175,000), and recreation (\$26,000).

The project total average annual cost of \$524,000 will be offset by its benefits. The resulting total project annual net benefit (annual benefit minus annual cost) is \$1,950,000.

Non-structural alternatives, such as property acquisition and removal, did not meet the project’s purpose, reinforcing the need for the WP-4 project. Costs for WP-4 are based on the 60% feasibility and design report in Attachment A and a breakdown of costs are shown in Table 11. Other structural alternatives to flood control, such as levees channel widening, would require removing existing property. PWCP and P-MRNRD proactively planned WP-4 to ensure its construction would not require demolition of existing property. The site has remained open in anticipation of WP-4’s construction for several years.

Table 11: Cost Breakdown

	Cost Estimate	40% Local Cost Share					WSF Grant Request (60%)
		NGPC Share	Gretna Share	Sarpy County Share	P-MRNRD Share	Total Local Cost Share	
<b>Engineering Design Services</b>	\$634,000		\$10,000	\$68,000	\$176,000	\$254,000	\$380,000
<b>Permitting</b>	\$37,000				\$15,000	\$15,000	\$22,000
<b>Other Professional Services (Administrative, Legal, Fiscal, etc.)</b>	\$1,149,000				\$459,000	\$459,000	\$689,000
<b>Land Acquisition</b>	\$3,357,000				\$1,343,000	\$1,343,000	\$2,014,000



<b>Engineering Construction Services</b>	\$828,000			\$54,000	\$277,000	\$331,000	\$497,000
<b>Construction</b>	\$6,913,000	\$150,000	\$100,000	\$500,000	\$2,105,000	\$2,705,000	\$4,058,000
<b>Totals</b>	\$12,918,000	\$150,000	\$110,000	\$622,000	\$4,375,000	\$5,107,000	\$7,660,000

7. Helps the state meet its obligations under interstate compacts, decrees, or other state contracts or agreements or federal law;
  - Identify the interstate compact, decree, state contract or agreement or federal law.
  - Describe how the project will help the state meet its obligations under compacts, decrees, state contracts or agreements or federal law.
  - Describe current deficiencies and document how the project will reduce deficiencies.

The WP-4 project will impound Wehrspann Creek, which is not currently listed on the Section 303(d) list of impaired waters established by NDEE. However, WP-4 is part of a series of dams and water quality basins that aids in reducing E. coli loadings and the Total Maximum Daily Load (TMDL) within the Papillion Creek Watershed. Specifically, Little Papillion Creek, Cole Creek, Big Papillion Creek, West Papillion Creek, and many of its tributaries are listed as impaired and improving the health of Wehrspann Creek contributes to the overall health of the Watershed.

Detaining water held in the reservoir by the WP-4 dam reduces E. coli load by increasing the water's detention time and the amount of time the surface area of sediment particles is exposed to the sunlight. Because of the increased exposure to UV rays and the additional time the particles are detained, more bacteria die off before the water is discharged through the dam's outlet works and transported downstream into Wehrspann Lake.

8. Reduces threats to property damage or protects critical infrastructure that consists of the physical assets, systems, and networks vital to the state or the United States such that their incapacitation would have a debilitating effect on public security or public health and safety;
  - Identify the property that the project is intended to reduce threats to.
  - Describe and quantify reductions in threats to critical infrastructure provided by the project and how the infrastructure is vital to Nebraska or the United States.
  - Identify the potential value of cost savings resulting from completion of the project.
  - Describe the benefits for public security, public health and safety.

The PCWMP (HDR 2009) recognized the need for proactive stormwater management by identifying areas for detention structures and water quality basin before urban development occurs. Projects that provide regional detention and water quality benefits, such as the WP-4 project, enable water resources to be managed and treated locally, reducing a region's reliance on state resources for flood damages, recovery, and response.

Furthermore, proactive regional projects such as this one preempts flooding problems brought about by impending development. Essentially, these projects work on a local scale, empowering communities to locally manage water resources, receive the recreational and aquatic habitat benefits by such management, and provide water quality benefits for communities located downstream. In this way, the WP-4 project provides immediate local benefits, reduces the local community’s reliance on state resources, and helps maintain the overall water sustainability of Eastern Nebraska.

Constructing the WP-4 project reduces the threat of property damage to properties located immediately downstream of the project. Specifically, five residential properties have been identified that will have the threat of structural flooding removed. In addition to these five properties, constructing the dam reduces flooding on an additional 20 properties, including Vala’s Pumpkin Patch which is a valuable local commercial destination. These properties are shown on Figure 10. Additionally, the stabilization of Wehrspann Creek will reduce bank erosion, provide 26.9-acres of riparian habitat and preserve 21-acres of additional greenspace. A new fishery and pedestrian trail will also be constructed. This project will improve the recreational opportunities for the residents. These flood damage reduction benefits will be obtained because the reservoir will attenuate flood flows through a 48” diameter principal spillway pipe.

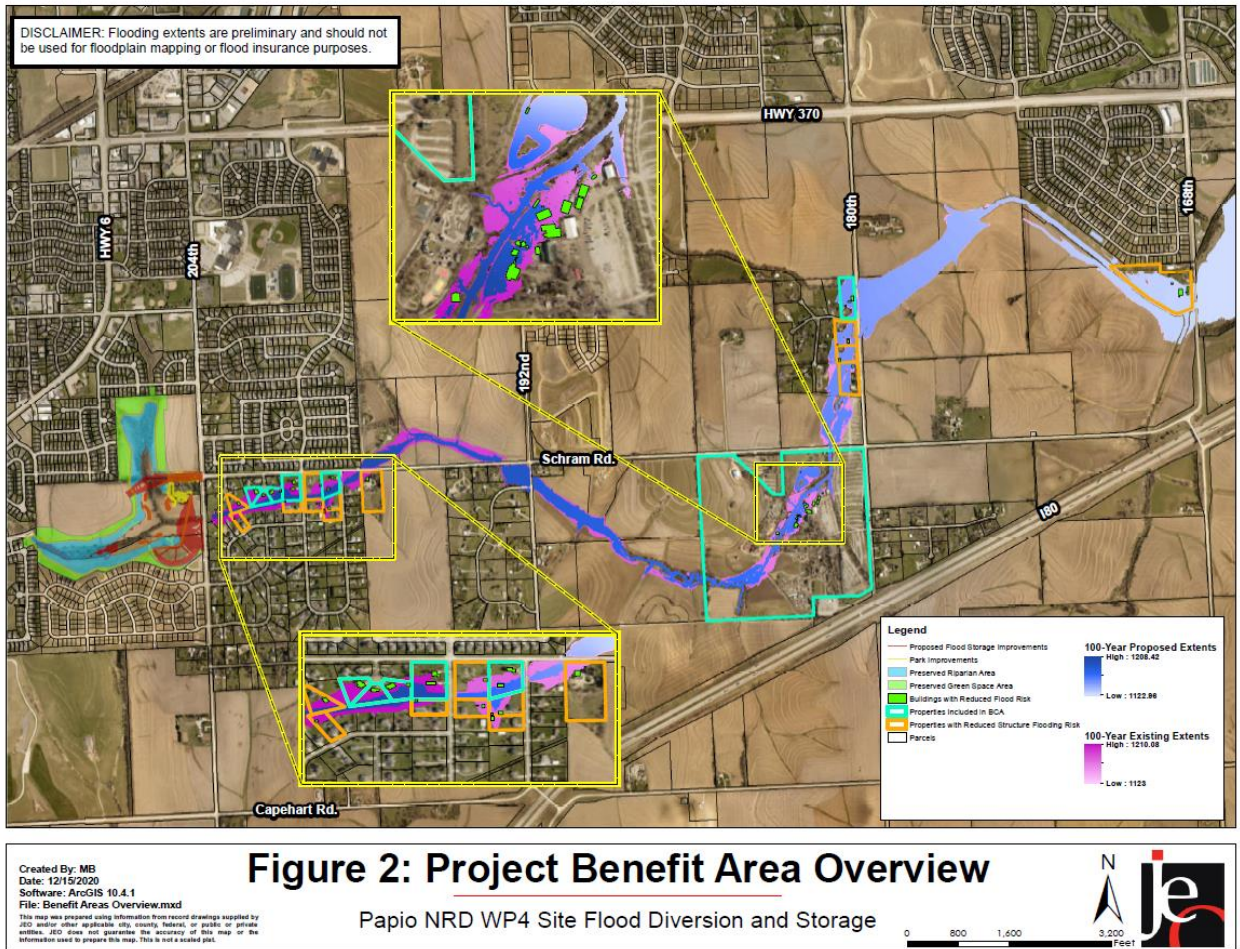


Figure 10: WP-4 Project Benefit Area

Eliminating and reducing threats to property damage benefits Nebraskans by improving the stability, safety, and security of Nebraskan communities. For this project, the community in question is Gretna, NE. The project has been designed to maximize these benefits.

9. Improves water quality;

- Describe what quality issue(s) is/are to be improved.
- Describe and quantify how the project improves water quality, what is the target area, what is the population or acreage receiving benefits, what is the usage of the water: residential, industrial, agriculture or recreational.
- Describe other possible solutions to remedy this issue.
- Describe the history of the water quality issue including previous attempts to remedy the problem and the results obtained.

WP-4's primary function is to regulate stream flow, but it will also function as a water quality basin, providing immediate benefits to downstream residential areas, agricultural areas, future developments and to Wehrspann Lake. In general, water quality basins improve downstream water quality because they trap sediment within the reservoir and prevent this sediment from being transported downstream. Because pollutants such as phosphorus and E. coli often stick to sediment particles, preventing the transport of sediment also reduces the transport of pollutants. In addition, exposure to UV rays kills bacteria and as sediment particles accumulate in the reservoir created by WP-4, the sunlight will kill harmful bacteria before the water is released downstream.

Although the footprint of the dam and reservoir are outside the current corporate limits of the city of Gretna, the land adjacent to the Project site draining into Wehrspann Creek is inside the corporate limits. As the City of Gretna has grown in population and agricultural lands are converted to urban land uses, more impervious areas have been developed and more impervious areas are expected to be developed. As a streamflow regulator, WP-4 will help maintain regular and natural streamflow that has been changed by increased development. Generally, the volume of runoff, or the volume of water that reaches streams and other water bodies because it does not soak into the ground, increases as development increases. These increased volumes can cause flooding within developed regions; consequently, reservoirs created by dams can help maintain regular streamflow rates and subsequently improve riparian habitats. Stream assessment studies completed by JEO and HDR in 2019 indicate that regular stream flow will improve the health of the stream by allowing channel banks to stop eroding and creating dependable aquatic habitat.

The local water quality benefits created as a result of WP-4 translates to better water quality downstream. In this way, both the human and aquatic communities located east of Gretna along Wehrspann Creek will receive the water quality benefits provided by the WP-4 project.

10. Has utilized all available funding resources of the local jurisdiction to support the program, project, or activity;

- Identify the local jurisdiction that supports the project.
- List current property tax levy, valuations, or other sources of revenue for the sponsoring entity.
- List other funding sources for the project.

The project's main sponsor is the P-MRNRD and the project is also supported by the City of Gretna, Sarpy County, and the NGPC to complete design and construction. Letters of support are provided in Attachment B. The P-MRNRD commonly leads large scale projects and is fully capable of implementing the proposed project. In general, the project is a product of the PCWP, consisting of a total of nine local governments that have contributed local resources to implement the PCWM Plan recognizing the need for proactive stormwater management.

To expedite the process, P-MRNRD paid for preliminary design through 60%, permitting, and has already purchased approximately 20 acres of the 81 acres needed for the project. This is a total pre-project contribution of \$1,793,000. The USACE 404 Individual Permit is already through the public notification process and is anticipated to be in hand before the end of 2021.

The P-MRNRD currently taxes at a levy rate of \$0.035846 per \$100 of valuation to obtain a property tax income of approximately \$28-million. This tax is part of a nearly \$85 million annual operating budget.

11. Has a local jurisdiction with plans in place that support sustainable water use;

- List the local jurisdiction and identify specific plans being referenced that are in place to support sustainable water use.
- Provide the history of work completed to achieve the goals of these plans.
- List which goals and objectives this project will provide benefits for and how this project supports or contributes to those plans.
- Describe and quantify how the project supports sustainable water use, what is the target area, what is the population or acreage receiving benefits, what is the usage of the water: residential, industrial, agriculture or recreational.
- List all stakeholders involved in project.
- Identify who benefits from this project.

The P-MRNRD is the local jurisdiction primarily responsible for construction of WP-4. The plan being implemented is the 2009 PCWMP issued by the Papillion Creek Watershed Partnership. The PCWP is a group of nine jurisdictions working on managing stormwater, peak flow reduction, pollution control, floodplain management, landscape

preservation, and erosion and sediment control. The PCWMP was most recently revised in 2019.

WP-4 helps the PCWP meet four of the policies outlined in the plan: 1) improve water quality from all contributing sources, 2) reduce stormwater peak discharge during development and after full build-out land use conditions, 3) preserve, restore, and conserve landscapes for recreational opportunities and pollutant reduction and 4) provide erosion and sediment control through storing sediment.

P-MRNRD's first Integrated Management Plan (IMP) was developed in 2014 and jointly adopted by the P-MRNRD and the Nebraska Department of Natural Resources (NeDNR). This project supports Goal #1 - Develop and implement water use policies and practices that contribute to the protection of existing surface and groundwater uses while allowing for future water development. WP-4 is a development of an existing water resource that will protect downstream water and groundwater uses. The reservoir will naturally recharge groundwater and provide a steady baseflow downstream.

In the 2019 update of the PCWMP, WP-4 was scheduled for construction between FY 2020 and FY 2024 provided funding is available. WP-4 will continue to improve water quality within the watershed by creating a reservoir that will serve as a regional detention basin. Regional detention has the advantage of addressing stormwater management on a regional basis rather than at a centralized or specific site. This allows for larger structures to be managed more effectively and provide greater benefits to a region. Because the dam will collect water regionally, this will enable the remaining 20% of the watershed to be developed and the increased runoff to be regulated and treated. The reservoir will also provide recreational activities because a trail and parking lot access will be constructed near the reservoir. Areas surrounding the reservoir will be preserved as greenspace and not subject to development. Finally, the dam will trap sediment within the reservoir and prevent the sediment from being transferred downstream.

Residents, businesses, and visitors to the general Omaha metropolitan area benefit from implementation of the PCWMP mainly due to flood risk reduction and recreation opportunities for a growing urban landscape. The P-MRNRD, the local jurisdiction responsible for the project, has overseen construction of WP-5 (Prairie Queen Reservoir) and Dam Site 15 (Flanagan Lake), two water quality facilities, and are currently working on construction at WP-6, WP-7, and soon to be WP-1. These projects plus several other proposed dam sites combined provide the collective flood risk reduction and recreation benefits planned by the PCWP since 2009. Work completed to date includes design up to 60%, submittal and review of the USACE 404 Individual Permit, and purchase of 20 acres of property, a total pre-project investment of \$1,793,000. The USACE 404 Individual Permit is already through the public notification process and is anticipated to be in hand by the end of 2021.

## 12. Addresses a statewide problem or issue;

- List the issues or problems addressed by the project and why they should be considered statewide.
- Describe how the project will address each issue and/or problem.
- Describe the total number of people and/or total number of acres that would receive benefits.
- Identify the benefit, to the state, this project would provide.

Flooding impacts, especially illustrated by the floods of 2019 witnessed in many locations in Nebraska, are a significant statewide issue. This project will reduce the flooding threat within the state's greatest population density and therefore help alleviate future local, state, and federal resources potentially needed after a major flood for response and recovery. The Nebraska State Hazard Mitigation Plan, updated in 2021, has goals based around themes including: prevention, property protection, public education and awareness, natural resource protection, and structural projects. The WP-4 project meets four of these key themes.

- **Prevention** – planning in 2009 secured open space to allow for construction of multiple flood retention structures. P-MRNRD is moving to build WP-4 before the opportunity available is interrupted by development or other unforeseen complications.
- **Public Education and Awareness** – through the work completed by the PCWP the public and property owners have been continuously educated on the goals to reduce flooding and improve water quality. WP-4 will include signage furthering this message and acknowledging the NRC as a funding source.
- **Natural Resources Protection** – stream stabilization will reduce threats to infrastructure and increase the natural amenities within an urbanized area, allowing a connection of people to nature.
- **Structural Projects** – this project meets this theme directly by building structures to reduce the impacts of a hazard, including dams.

As previously described, WP-4 is part of a system of small detention basins that once constructed will reduce flooding threats in Nebraska's most populous area, or approximately 750,000 residents. The PCWMP structures are designed to work together to protect homes, businesses, industries, and provide the additional benefits of water quality improvement, streambank stabilization, and recreational opportunities. These projects will provide hazard mitigation in a proactive manner reducing future damages and protecting public health and safety.

The Papillion Creek Watershed area is developing quickly with approximately 80% of the land developed and the remaining 20% is expected to be developed by the year 2050. Consequently, the project's flood reduction benefits help meet Nebraska's Water Sustainability Fund's sustainability goals. The land used for the project will not be available for development and will be used as riparian habitat and recreation area. The project will benefit the area by trapping flood flows and releasing water at a slower rate; thereby reducing peak flood volumes and elevations. The project will benefit the state by reducing the area's reliance on the state for flood control, prevention, and recovery.

13. Contributes to the state's ability to leverage state dollars with local or federal government partners or other partners to maximize the use of its resources;

- List other funding sources or other partners, and the amount each will contribute, in a funding matrix.
- Describe how each source of funding is made available if the project is funded.
- Provide a copy or evidence of each commitment, for each separate source, of match dollars and funding partners.
- Describe how you will proceed if other funding sources do not come through.

The NRDs bring local expertise and experience to the partnership with State resources. P-MRNRD has a responsibility to its constituency to provide guidance on comprehensive natural resources management projects with specific authority, by Nebraska state statute (Neb. Rev. State. Sec. 2-3203), which provides taxing authority, eminent domain ability, and outlines management duties specific to flood control, soil erosion, irrigation runoff, and groundwater quantity and quality. As a local government, the NRDs can leverage local resources with state and federal resources, creating a collaborative funding partnership that enables large-scale projects, such as WP-4, to become a reality. There are four funding partners identified for this project thus far including the P-MRNRD, City of Gretna, Sarpy County, and NPGC. The NRC would become the fifth and most critical funding partner, allowing the project to proceed to construction in 2022.

On the local level, both Sarpy County and the City of Gretna are assisting in the transportation and utility infrastructure surrounding the projects. Sarpy County is contributing \$500,000 towards the embankment over the North Water Quality Basin. This will allow the future Schram Road extension (part of a separate project) to be built without interruption to the reservoir and its amenities.

The City of Gretna will be responsible for taking over the long-term maintenance of the park area (the P-MRNRD remains responsible for the dam and its appurtenances) estimated at \$20,000 per year.

The NGPC is anticipated to contribute Federal Sports Fish Restoration Program and/or Motorboat Access Program funding for elements such as deepening the reservoir to maintain a fishery, angler access, offshore breakwater, and public access area.

Lastly, synergies were identified by P-MRNRD and developers of the Lakeview subdivision to optimize grading between the subdivision and future dam site near the proposed auxiliary spillway. This, in addition to accounting for future development and infrastructure expansions with the rest of the project site will lead to a well-planned area that should provide cost savings for future growth.

These partnerships at all levels maximizes the P-MRNRD's investment and benefit to their constituents while meeting the State's goals of flood risk reduction and providing opportunities to connect people to nature. If NGPC, Sarpy, or Gretna are unable to fulfill

its funding obligation, P-MRNRD will allocate budget from its General Fund to complete the project elements. The cost-share schedule is provided in Table 12

Table 12: Cost Share Breakdown for the WP-4 Project

	Cost Estimate	40% Local Cost Share					WSF Grant Request (60%)
		NGPC Share	Gretna Share	Sarpy County Share	P-MRNRD Share	Total Local Cost Share	
<b>Engineering Design Services</b>	\$634,000		\$10,000	\$68,000	\$176,000	\$254,000	\$380,000
<b>Permitting</b>	\$37,000				\$15,000	\$15,000	\$22,000
<b>Other Professional Services (Administrative, Legal, Fiscal, etc.)</b>	\$1,149,000				\$459,000	\$459,000	\$689,000
<b>Land Acquisition</b>	\$3,357,000				\$1,343,000	\$1,343,000	\$2,014,000
<b>Engineering Construction Services</b>	\$828,000			\$54,000	\$277,000	\$331,000	\$497,000
<b>Construction</b>	\$6,913,000	\$150,000	\$100,000	\$500,000	\$2,105,000	\$2,705,000	\$4,058,000
<b>Totals</b>	\$12,918,000	\$150,000	\$110,000	\$622,000	\$4,375,000	\$5,107,000	\$7,660,000

14. Contributes to watershed health and function;

- Describe how the project will contribute to watershed health and function in detail and list all of the watersheds affected.

This project will have a direct benefit Wehrspann Creek watershed locally and provide indirect downstream benefits to the Papillion Creek watershed. The project will also benefit Wehrspann Lake, a 250-acre lake and a 940-acre recreation area located five miles downstream. Wehrspann Lake was federally constructed by USACE in the 1980's and the recreation area is managed by P-MRNRD. Some of the general improvements in watershed health and function include:

- **Nutrient cycling and erosion/sedimentation control** - Providing a natural area to trap sediments, nutrients, and bacteria is another benefit of retention structures. Developed areas do see increases in impermeable area and runoff will often carry automotive oils and fluids, bacteria, and sediments which can pollute streams. If not filtered, these pollutants can accumulate and damage both aquatic life and the overall health of riparian areas. Because WP-4 will be located in an urban area, pollutants will be trapped within the two water quality basins and the reservoir, benefiting water quality downstream.



- **Increased biodiversity** - The project overall will significantly improve stream health and function and create a 15-acre lake supporting a fishery and aquatic habitat.
- **Habitat** - Specifically, there will be an overall increase in stream habitat stability, improvements to riparian buffer communities and decreases in erosion, and increase in net aquatic functions. Tree and shrub dominated areas may also develop with the buffer zone by natural colonization or promoted with plantings in designated areas.
- **Water storage** – The reservoir will store surface water, creating a natural filter for pollutants and contributing to groundwater recharge.
- **Flood control** – The reservoir will reduce peak flows downstream thus reducing inundation of populated areas and reducing potential damages.
- **Physical and mental benefits** – WP-4 will provide living spaces with views of green open space and provide natural scenery in an urban area. Additionally, people in the area are more likely to exercise with easy access to recreation areas such as parks, trails, greenways, and woodlands.

15. Uses objectives described in the annual report and plan of work for the state water planning and review process issued by the department.

- Identify the date of the Annual Report utilized.
- List any and all objectives of the Annual Report intended to be met by the project
- Explain how the project meets each objective.

The NeDNR's Annual Report and Plan of Work for the State Water Planning and Review Process (NeDNR Annual Report) dated September 2020 identifies objectives for implementing the state water planning and review process. This project meets multiple objectives identified, including:

*Objective #1 - Maintain data, information, and analysis capabilities for water planning, including specific programs for collecting, maintaining, and distributing information on streamflows, as well as analyzing water uses and water supplies across the state;*

The PCWMP included a significant volume of hydrologic data such as streamflow, streams, watershed, drainage models, floodplain, and pollutant loading information provided by NeDNR, NDEE, USGS, and other entities. The P-MRNRD regularly collaborates to share and utilize existing information with the NeDNR. Annual maintenance cost estimates for structures were based on guidelines provided by NeDNR.

*Objective #2 - Provide staff and resources to support planning and implementation of water resources projects;*

Providing information on floodplain management, hazard mitigation, and surface water is an action completed regularly by P-MRNRD staff who will utilize NeDNR staff when necessary to provide technical information or project support. NeDNR will be responsible

for reviewing this application, H&H data for the project, and providing NeDNR permits to impound and to construct the dam.

*Objective #3 - Participate in interagency collaboration with federal agencies, state agencies, local natural resources districts (NRD's), and other water interest entities on various water resources programs and projects;*

P-MRNRD staff and directors worked directly with NeDNR collaboratively on the creation of the IMP and also the Groundwater Management Plan. The two agencies regularly collaborate on a variety of projects such as floodplain management, dam maintenance and inspections, and planning and permitting of damsites, such as WP-4.

*Objective #4 - Consolidate and present information in a form that is understandable and useful to the public and interagency collaborators.*

The P-MRNRD has a robust public education program. The P-MRNRD will routinely inform the public about the WP-4 project through their website and various social media outlets.

*Objective #5 - Participate in interagency collaboration with federal agencies, state agencies, local natural resources districts (NRDs), and other water interest entities on various water resources programs and projects*

Flood risk reduction is a major goal of NeDNR and P-MRNRD. Building WP-4 as part of the system of flood retention structures in the watershed achieves that goal and has been completed in collaboration with NeDNR staff and technical resources.

*Objective #6 - Consolidate and present information in a form that is understandable and useful to the public and interagency collaborators.*

NeDNR data and technical resources are regularly used in P-MRNRD press releases, news articles, planning documents, and studies, as was the case with development of the PCWMP. P-MRNRD will continue to work with NeDNR to present information to the public on WP-4 through the water storage and dam permitting process.

16. Federal Mandate Bonus. If you believe that your project is designed to meet the requirements of a federal mandate which furthers the goals of the WSF, then:

- Describe the federal mandate.
- Provide documentary evidence of the federal mandate.
- Describe how the project meets the requirements of the federal mandate.
- Describe the relationship between the federal mandate and how the project furthers the goals of water sustainability.

Under the Clean Water Act, Section 303, all bodies of water, including Wehrspann Creek, are required to meet Total Maximum Daily Loads (TMDLs), or maximum

amounts of bacteria in the streams. Reservoirs, such as the one created by WP-4, capture bacteria and pollutants from agricultural runoff. Because the travel time is reduced, bacteria will die off before they reach downstream. Furthermore, greater detention time in the reservoir allows the bacteria to be killed off by the sun before being transferred downstream.