NEBRASKA NATURAL RESOURCES COMMISSION

Water Sustainability Fund

Application for Funding

Section A.

ADMINISTRATIVE

PROJECT NAME: Papio NRD Dam Site 12 and Associated Improvements

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

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

Sponsor Contact's Name: John Winkler, General Manager

Sponsor Contact's Address: 8901 S. 154th 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: N/A

   Grant amount requested. $9,914,257

   - 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☐	Obtained: YES☒	NO☐
DNR Surface Water Right	N/A☐	Obtained: YES☐	NO☒
USACE (e.g., 404/other Permit)	N/A☐	Obtained: YES☒	NO☐
FEMA (CLOMR)	N/A☐	Obtained: YES☐	NO☒
Local Zoning/Construction	N/A☐	Obtained: YES☐	NO☒
Cultural Resources Evaluation	N/A☐	Obtained: YES☒	NO☐
Other (provide explanation below)	N/A☐	Obtained: YES☐	NO☒

A US Army Corps of Engineers (USACE) Individual Section 404 permit has been obtained for the project (3/14/2024). This is provided in Attachment A of the Supporting Information Attachment (SIA). Coordination required for federally listed threatened and endangered species (Section 7 of the Endangered Species Act) and cultural resources (Section 106 of the Historic Preservation Act) was performed and completed by USACE as part of the 404 permitting process. A Section 401 Water Quality Certification was obtained from the Nebraska Department of Environment and Energy (NDEE). A Nebraska Game and Parks

Environmental Review through the Conservation and Environmental Review Tool (CERT) was completed as part of the Section 401 review.

Permits marked as “No” above include a National Pollution Discharge Elimination Systems (NPDES) General Construction Stormwater General Permit from NDEE, a Conditional Letter of Map Revision (CLOMR) from the Federal Emergency Management Agency (FEMA), a Grading Permit from the Papillion Creek Partnership, and a Dam Safety Plan approval and Permit to Impound Water from the Nebraska Department of Natural Resources (NeDNR). These permits will be obtained before the end of 2025. The estimated cost for submitting the applications and any coordination required to obtain the permits is $10,000.

4. **Partnerships**

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

The Dam Site 12 and Associated Improvements Project (Project) brings together several agency partners that have jurisdiction within the Project area. The Papio-Missouri River Natural Resources District (Papio NRD), Papillion Creek Watershed Partnership (PCWP), Nebraska Game and Parks Commission (NGPC), and City of Omaha are all stakeholders in the Project. NGPC is a potential funding partner and will also participate in the design of the in-lake fisheries and recreational facilities. Douglas County and the City of Omaha oversee key infrastructure, including sewer lines and county roads, which will be influenced by the Project. Finally, the Papio NRD and PCWP members will work together to provide Project planning and administration. See Attachment B of the SIA for letters of support.

Identify the roles and responsibilities of each Partner / Co-sponsor involved in the proposed Project regardless of whether each is an additional funding source.

Papio-Missouri River NRD (Papio NRD):
Nebraska’s Natural Resources Districts, including the Papio NRD, 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 Papio NRD’s boundary includes all of Sarpy, Douglas, Washington, and Dakota counties and the eastern halves of Burt and Thurston counties. The Papio NRD serves the largest population area of the 23 state NRDs. Papio NRD has taxing authority and the funding capacity to meet cost-share requirements.

Papillion Creek Watershed Partnership (PCWP):
Papio NRD is the administrative agent for PCWP. This partnership was formed in 2001 to address water quantity and quality in the Papillion Creek Watershed. Members of the partnership include the Papio NRD; the cities of Gretna, Omaha, Bellevue, Ralston, Papillion, LaVista, and Boys Town; and Sarpy County. In its 2024 Updated Watershed Plan, PCWP identified Dam Site 12 as a program

project for implementation in fiscal year (FY) 2025 to FY2029. PCWP members collect a watershed development fee on new development to cover approximately one-third of the estimated costs of the watershed management plan's structural portion.

Nebraska Game and Parks Commission:
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 offshore 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.

City of Omaha:
Dam Site 12 is located in the unincorporated area of Douglas County (County) and within the extra-territorial jurisdictional (1-mile) boundary of the City of Omaha (City). Upon Project completion, the Project site will be transferred to the City for ownership and maintenance. Papio NRD will retain a permanent easement along the dam footprint for operation, maintenance, repair, replacement, and rehabilitation (OMR&R) activities. The City attended coordination meetings during preliminary design, is fully supportive of the Project, and will be a funding partner related to long-term maintenance and operation of the site.

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.

A complete summary of the capital costs was developed and is provided in Table A-1 below. Cost-sharing from local Project partners will go toward this Project and is summarized in Table A-1. The City of Omaha's commitment to long-term maintenance is confirmed in their letter of support included in Attachment B of the SIA. NGPC's commitment to applying for funds for these Project is confirmed in their letter of support (Attachment B of the SIA). The Project is not reliant on these funds, and if they are not received, Papio NRD is capable of funding this portion of the Project.

NGPC: NGPC can apply obtained grant funds through the United States Fish and Wildlife Service's SportFish Restoration Fund and Motorboat Access Fund toward the construction costs of the fisheries and water access portion of the recreational facilities at the sites. Papio NRD will apply for $250,000 to support the construction of the eligible fisheries and boat ramp features at the sites.

City of Omaha: The City will manage the recreational facilities located at the site upon completion of the Project. The City is a funding partner related to the site's long-term operation and maintenance.

Douglas County: The County will be a cost-sharing partner for a portion of the 216th and Fort Street realignment and will maintain the roadways after construction. The roadway type will be coordinated during final design and cost-sharing will be established at that time.

Table A-1: Project Cost and Funding Source Summary

Item	Cost Estimate	NGPC Share	Papio NRD Share	Total Local Cost Share	WSF Grant Request (60%)
Engineering Design Services	$845,000		$338,000	$338,000	$507,000
Permitting	$10,000		$4,000	$4,000	$6,000
Other Professional Services (Administrative, Legal, Fiscal)	$10,000		$4,000	$4,000	$6,000
Land Acquisition	$500,000		$200,000	$200,000	$300,000
Engineering Construction Services	$700,000		$280,000	$280,000	$420,000
Construction	$14,458,762	$250,000	$5,533,504	$5,783,505	$8,675,257
Totals	$16,523,762	$250,000	$6,359,504	$6,609,505	$9,914,257

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!

Since 2001, PCWP has been working to improve stormwater management and reduce flood risk by implementing projects identified in the Papillion Creek Watershed Management Plan (PCWMP) within the West, Big, and Little Papillion Creek Watersheds (see Attachment C, Figure 1, of the SIA). PCWP members consist of the cities of Bellevue, Boys Town, Gretna, La Vista, Omaha, Papillion, and Ralston; Sarpy County; and the Papio NRD. 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. Papio NRD, in partnership with the City of Omaha and NGPC, is leading the

construction of a regional flood control and water quality detention basins on West Papillion Creek in the West Papillion Creek Watershed. Dam Site 12 (DS-12) was part of a 1967 report from USACE regarding flood control in the watershed and has been included in other analyses, reports, and watershed plans since that time. The location of DS-12 is provided in Attachment C, Figure 2, of the SIA.

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. PCWP, led by Papio NRD, 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 was developed, and it identified a strategy for flood damage reduction that included a combination of regional detention basins, water quality basins, and Low Impact Development (LID) strategies throughout the watershed (HDR 2009). Highlighted improvements implemented based on the 2009 PCWMP as of March of 2025 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 twelve potential water quality basins have been constructed.
- A total of seven of fourteen regional detention basins have been constructed or are under construction (WP-2 and WP-4 are nearly completed; construction has just begun on WP-1). See Attachment C, Figure 3, of the SIA.

As projects in the PCWMP are implemented, a re-prioritization of the remaining projects is defined every 5 years. DS-12 was designated as a program project for FY2025 to FY2029 because of impending development and the opportunity to reduce the potential for flood damage immediately downstream of the Project.

Papio NRD and Project Partners propose to construct a 1,050-foot-long earthen dam (from the left abutment to the auxiliary spillway) approximately 28 feet above the valley floor with a top of dam elevation (EL) of 1222. This dam will impound approximately 43 surface acres of water at a normal pool EL 1206. The dam structure will be located in Douglas County, Nebraska, along West Papillion Creek (see Attachment C, Figure 4, of the SIA). The proposed dam alignment is located on 216th Street and approximately 0.25 mile south of Fort Street. With the location of West Papillion Creek adjacent to 216th Street and the construction of DS-12 intersecting 216th Street, 216th Street will be realigned to the east. Approximately 4,300 lineal feet will be shifted eastward, and approximately

1,000 lineal feet of Fort Street will be removed and realigned to tie back into the proposed 216th Street alignment. The contributing drainage area at the proposed detention site is approximately 2.6 square miles. In addition to the construction of the Main Dam, the Project will include the construction of two upstream water quality basins; a recreational trail; two public access areas, including a boat ramp; and the realignment of 216th Street roadway.

The Project has two objectives. The first objective is to improve flood control within the West Papillion Creek Basin, and the second is to provide lake-based recreation for the Omaha metropolitan area. Improvement in West Papillion Creek flood control will reduce flood damages and threats to human life for the Omaha metropolitan area. In addition, the proposed Project will increase supply of lake-based recreation activities for residents within the Omaha metropolitan area. The Project, characterized with a normal pool EL 1206, will provide the following:

- A permanent 43-acre pool based on a reservoir sustainability of 2.5 percent (the percentage of lake surface area to drainage basin area).
- Two water quality basins, one located northwest of the DS-12 and a second located between the existing 216th Street alignment and proposed 216th Street realignment, for water quality benefits to the reservoir.
- Reduction in the 100-year peak flow at DS-12 from approximately 2,480 cubic feet per second (cfs) to 300 cfs at the outflow of the principal spillway.
- Sediment storage capacity of 47 acre-feet.
- Approximately 843 acre-feet of flood storage capacity.
- Flood control benefits downstream because of the proximity of the surrounding development in the City of Omaha.
- A mix of water depths to support sustainable fisheries.
- Approximately 28 acres of emergent wetland habitat.
- Approximately 154 acres of upland habitat.
- Recreational amenities to support lake- and land-based recreation, including boat ramps, fishing access, a recreational trail, gathering space, and open passive recreation opportunities.

7. Project Tasks and Timeline

Identify what activities will be conducted to complete the project, and the anticipated completion date.
For multiyear projects please list (using the following example):

- 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.

The following tasks have been identified for the Project:

Engineering, Planning, and Permitting: Includes all data collection, testing, modeling/analysis, design, engineering, coordination and permitting of the dam and all associated features. The site has roadway design/considerations, recreational facilities, and two water quality basins included as part of the Project.

Professional Services: Includes the administrative and legal services required to facilitate land purchase and handle Project coordination.

Land Rights: Includes the costs to obtain the property required for the Project.

Capital Improvement Costs: Includes dam construction, all associated features, and engineering construction services.

Table A-2 provides a project timeline and correlated yearly expenditures.

Table A-2: Project Funding Timeline

Item	2025	2026	2027	Remaining	Total
Engineering Design Services	$633,750	$211,250	$0	$0	$845,000
Permitting	$7,500	$2,500	$0	$0	$10,000
Other Professional Services (Administrative, Legal, Fiscal)	$7,500	$2,500	$0	$0	$10,000
Land Acquisition	$500,000	$0	$0	$0	$500,000
Engineering Construction Services	$0	$375,000	$325,000	$0	$700,000
Construction (Capitol Improvements)	$0	$7,884,695	$6,574,068	$0	$14,458,762
Totals	$1,148,750	$8,475,945	$6,899,068	$0	$16,523,762

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;

This Project will include the structural components for DS-12 and associated improvements, and realignment of a portion of 216th Street. A feasibility study and preliminary site design were completed for Papio NRD in May 2018. The plans, preliminary design reports, and accompanying supporting information are included in Attachment D of the SIA.

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

DS-12 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 2024 update to the PCWMP identified DS-12 as one of three program projects for implementation during FY2025 to FY2029. Furthermore, as land is developed, fewer viable areas are available for flood protection, and those areas that 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);

On-Site Investigations:

On-site investigations at Dam Site 12 were conducted by the owner and design engineers to collect visual observations and gain an understanding of the proposed dam locations. Site surveys were performed to collect locations of any visible utility markers, drainage structures, and topographical data. Legal boundary surveys were performed to develop land purchase documents.

Geotechnical subsurface investigations consisted of 24 exploratory test borings. The locations of the borings included along the centerline of the main dam, near the upstream and downstream ends of the dam embankment, along the principal spillway, along the auxiliary spillway, and in borrow areas. Laboratory testing of the soil samples was conducted to outline depths, thicknesses, and lateral extent of the various soil strata. Additional information on the geotechnical subsurface investigation can be found in Appendix A of Attachment D of the SIA. Additional soil borings are planned as part of the final design.

A wetland delineation was completed in 2017 to identify the location of jurisdictional water bodies located on the Project site. Stream assessments (Nebraska Stream Condition Assessment Procedure) were also completed to document current and future channel conditions within the Project limits and to determine stream mitigation requirements. Both assessments were used as part of the Section 404 Clean Water Act Individual Permit application and ultimately used by USACE for their issuance of a Section 404 Permit (provided in Attachment A of the SIA).

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

The PCWMP (HDR 2009) and associated updates provide the background for the basis of Project implementation.

Attachment C of the SIA contains a general figure of the Papillion Creek Watershed (Figure 1), a Project Location Map (Figure 2), a map of the status of regional detention basin implementation in the Papillion Creek Watershed per the PCWMP (Figure 3).

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

As per State statute, a Permit to Impound Water application will be submitted for DS-12 and will be submitted to NeDNR upon completion of the Project's final design. Said water right is to permanently store water in the dam's reservoir. Water rights in the Papillion Creek Watershed are typically uncontended and very few senior water rights exist downstream of the proposed dams. Land rights will be required for the construction, operation, and maintenance of these sites. Papio NRD intends to obtain the land rights fee-title and does not anticipate any resistance, because the sites have been identified in the master planning efforts

by the City and are included in the development plan. The local planning jurisdiction (City of Omaha) supports the implementation of this site.

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

Main Dam:
Key elements of the embankment design include the construction of an inspection trench and an internal drainage system consisting of a chimney drain, finger drains, and a blanket drain along the existing channel.
The principal spillway alignment was placed within the location of the deep, compressible alluvial deposits; therefore, the Main Dam and principal spillway will be constructed with a staged approach to minimize long-term differential settlements in the principal spillway. The Main Dam will be placed, the embankment will be allowed to consolidate, and an excavation will be constructed through the Main Dam embankment so that the principal spillway can be constructed. The principal spillway alignment will include a camber to account for the remaining relatively minor settlement. See Attachment D, Appendix E, Preliminary Design Drawings.

West and South Water Quality Basins:
Two (2) upstream water quality detention basins are to be constructed to allow sediment to settle and improve water quality prior to discharging into the Main Dam detention area (referred to as the West and South Water Quality Basins). The West Water Quality Basin will be located near the section line (Fort Street extended) and on West Papillion Creek. The South Water Quality Basin will use the existing 216th Street alignment and be located between the Main Dam left abutment and Fort Street on a tributary channel. See Attachment D, Appendix E, Preliminary Design Drawings.

Proposed Realigned 216th Street:
With the location of West Papillion Creek adjacent to 216th Street and the construction of DS-12 intersecting 216th Street, it is necessary to realign 216th Street to the east. Approximately 4,300 lineal feet of 216th Street will be shifted to the east and approximately 1,000 lineal feet of Fort Street will be removed and realigned to tie back into the proposed 216th Street alignment. See Attachment D, Appendix B, Proposed 216th Street Realignment.

216th Street Weir Drainage Improvements:
With the proposed realignment of 216th Street, the existing twin 10-foot x 5-foot reinforced concrete box (RCB) drainage structure located approximately 430 feet north of Fort Street is to be removed and replaced. The replacement structure will be located approximately 50 feet east of the existing structure and will include a weir on the upstream side of the structure to provide a water-quality pool to allow sediment to settle and improve water quality prior to discharging into the Main Dam detention area. See Attachment D, Appendix E, Preliminary Design Drawings.

In-Lake Features:
To enhance the lake's aquatic habitat, in-lake improvements are to be constructed to provide habitat diversity. Improvements consist of earthen berms, breakwater jetties, vegetative barriers, tree piling, and shoaling areas. Suitable excavations from the permanent pool area can be used as fill for the dam embankment. See Attachment D, Appendix E, Preliminary Design Drawings.

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

A geotechnical investigation, field exploration, and laboratory testing were conducted to collect and test samples, characterize the subsurface soil and groundwater conditions, evaluate the engineering parameters for the foundation and embankment soils, and provide design and construction recommendations for the proposed Main Dam and its appurtenant structures. Preliminary seepage, stability, and settlement analyses were also performed for the Main Dam. The geotechnical report can be found in Attachment D, Appendix A, Section A-1, Preliminary Report of Geotechnical Investigation and Design. Additional soil borings are planned as part of final design.

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

As referenced in Attachment D, Appendix A, Hydrology/Hydraulics and Sedimentation Analysis, the HEC-HMS future conditions model developed in the 2017 Papillion Creek Hydrologic Analysis was considered best available data at the time of the preliminary design and was used as a basis for the evaluation and design of DS-12. The 2017 analysis was an update from previous analyses (updated in 2004 and then again in 2010), with the most recent update completed in 2019 (HDR 2019). Three storm types that could potentially occur over the Papillion Creek Watershed were analyzed; the storm types are: (1) local, (2) hybrid, and (3) general storms. A sensitivity analysis identified the local storm as the most conservative storm on which to base the dam design. Additional details for the hydrologic analysis, such as point precipitation depths, probable maximum precipitation depths, and precipitation depths for high hazard Principal Spillway Hydrograph (PSH), Auxiliary Spillway Hydrograph (ASH), and Freeboard Hydrograph (FBH) are included in Attachment D, Appendix A, Hydrology/Hydraulics and Sedimentation Analysis.

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).

HDR completed preliminary design for DS-12 in 2018 (see Attachment D of the SIA). The final design for the elements listed in Section 1.A.6 will begin in

Spring 2025 and is anticipated to be complete in Spring 2026. A summary of the criteria used for preliminary design, which will be further refined during final design, is provided below. Additional information on the criteria and the design can be found in Attachment D of the SIA.

The engineering analyses and design evaluations will be completed using Natural Resources Conservation Service (NRCS) design guidelines, with particular emphasis on the requirement of TR-60, *Earth Dams and Reservoirs,* and State of Nebraska Dam Safety Standards. Additional design guidelines and criteria include: USACE, US Bureau of Reclamation (USBR), the American Concrete Institute (ACI), Portland Cement Association (PCA), and American Society of Civil Engineers (ASCE).

DS-12 is classified as high hazard potential in accordance with Nebraska State Statutes for Dam Safety. A geotechnical investigation was conducted to collect and test samples, characterize the subsurface soil and groundwater conditions, and evaluate the engineering parameters for the proposed Main Dam and its appurtenant structures. Key elements of the embankment design include the construction of an inspection trench and an internal drainage system consisting of a chimney drain, finger drains, and a blanket drain along the existing channel. Further evaluation will be performed during final design including, but not limited to: a differential settlement assessment, additional analysis of the finger drain outlets, dewatering needs during construction, and additional geotechnical investigation (including borings and labs) for the 216th Street alignment and water quality basins.

Hydrology and Hydraulics Design used the HEC-HMS future conditions model developed in the 2017 Analysis (considered best available data) and the 2004 HEC-RAS model for West Papillion Creek flood hazard update (floodplain regulatory model at the time of the analysis). Three storm types were evaluated, local, hybrid, and general storms, with the local storm selected for design as it was determined to be the most conservative. Documents that informed the design were: Site Specific Probable Maximum Precipitation Study for Nebraska, NOAA Atlas 14 Volume 8 Precipitation-Frequency Atlas of the United States (Midwestern States), NRCS SITES 2005 Water Resources Site Analysis Computer Program, NRCS Technical Release No. 60 Earth Dams and Reservoirs, and USBR Criteria and Guidelines for Evaluating Storage Reservoirs and Sizing Low-Level Outlet Works. Further evaluation will be performed during final design including, but not limited to: dam breach analysis, detailed modeling of principal spillway hydraulics, wave setup and runoff evaluation, additional SITES modeling, and additional analysis for auxiliary spillway design.

Structural elements of the Main Dam include the principal spillway and the outlet works. The principal spillway is assumed to be a two-way covered riser with a low-level drawdown and a reservoir level control weir gate; the outlet works is a Standard USBR Type IV energy dissipator. The basis of design for the structural

components considered: Soil Conservation Service Technical Release No. 30 Structural Design of Standard Covered Risers and various USACE and USBR Hydraulic Designs of Stilling Basins and Energy Dissipators. Further evaluation will be performed during final design, including but not limited to: three-edge-bearing strength evaluation for the principal spillway conduit, inlet riser structural analysis, outlet stilling basin structural analysis, and buoyancy criteria analysis for the final structure member geometry.

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

1.B.1 Insert data necessary to establish technical feasibility (004.02); Click here to enter text.

1.B.2 Discuss the plan of development (004.02 A); Click here to enter text.

1.B.3 Describe field or research investigations utilized to substantiate the project conception (004.02 B); Click here to enter text.

1.B.4 Describe any necessary water and/or land rights (004.02 C); Click here to enter text.

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). Click here to enter text.

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.

Flood reduction in the Papillion Creek Watershed has been studied extensively through efforts undertaken by PCWP. The PCWMP (HDR 2009) developed an integrated approach to address peak flow reduction using a combination of Low Impact Development (LID) and regional detention structures in the watershed. Even with incorporating LID techniques in the watershed, the reduction in the 100-year peak flow would be minimal. Therefore, it was concluded that the regional detention structures are still required to reduce flood flows and prevent associated damage.

Multiple structure locations and combinations were analyzed for their flood reduction and water quality potential, yielding this site as the most favorable in this watershed.

The Project's purpose is also to address a shortage of lake-based recreation opportunities. Multiple alternatives to the Project were considered to address lake-based recreation. Alternatives included building new reservoirs and/or lakes in other locations within the DS-12 service area. It was concluded that, to meet the purposes of flood damage reduction and lake-based recreation, separately constructing a flood damage reduction structure and a lake-based recreation structure would be over three times as costly to receive the same benefits.

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. (Title 261, CH 2 - 005).

Pursuant to the Water Sustainability Fund (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 Project costs. 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 the 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).

A summary of all pending capital costs related to the Project are presented in Table B-1 below. A detailed breakdown of all costs (including those identified for this section) and costs already expended are provided in Table 10 of Attachment F of the SIA. Papio NRD has already acquired land for the Project totaling $11,689,500.

Table B-1: Capital Cost Summary

Summary of Costs	DS-12
Engineering Design Services	$ 845,000
Permitting	$ 10,000
Other Professional Services	$ 10,000
Remaining Property Acquisition	$ 500,000
Engineering Construction Services	$ 700,000
Construction	$ 14,458,762
Subtotal	**$ 16,523,762**
Annual OM&R	$ 62,784

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).

Pursuant to WSF grant guidelines, primary tangible benefits were evaluated for comparison to the Project costs. Benefits considered are flood reduction, green space, recreation, and land improvement values. The period of analysis for this Project is 50 years. Table B-2 provides a summary of these monetized benefits. Attachment F of the SIA provides details on the method used to calculating these benefits.

Table B-2: Summary of Benefits

Benefit Category	Calculated Value	# of Occurrences Over Lifetime	Lifetime Benefits
Flood Damage Reduction	$236,608	47	$11,120,578
Green Space	$1,243,280	47	$58,434,160
Recreational	$43,997	47	$2,067,852
Upstream Land Improvement	$2,923,297	1	$2,923,297
Downstream Land Improvement	$647,736	1	$647,736
Total Benefits			$75,193,623

Table B-3 in Question 3.C provides a summary of benefits received by year.

In addition, the Project will create intangible benefits that cannot be expressed in monetary terms but collectively help promote healthy watersheds. This Project will result in the establishment and protection of natural areas and will create opportunities for natural world discovery, wildlife viewing, hiking, enjoyment of scenic beauty, picnicking, family unit enhancement, environmental education, and environmental appreciation.

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).

The costs and benefits have been assessed over a 50-year lifetime, as shown in the cash flow stream in Table B-3.

Table 1-3: Cash Flow Stream

Project Year(s)	Calendar Year(s)	Cash Flow Categories	Costs	Benefits	Details
0	2025	Land Acquisition	$11,689,500		
		Engineering Design Services	$633,750		
		Permitting	$7,500		
		Other Professional Services	$7,500		
		Property Acquisition	$500,000		
		Total Costs	**$12,838,250**		
		Total Benefits		**$0**	
1	2026	Mobilization/Demobilization	$471,506		
		Construction Survey	$42,792		
		Construction Quality Control Material Testing	$25,358		
		Erosion Control Measures	$83,207		
		Site Clearing	$206,036		
		Water Management Control	$23,773		
		Bank Excavations	$63,792		
		Main Dam Earthwork	$1,250,957		
		Principal Spillway	$237,344		
		West Water Quality Basin	$111,664		
		South Water Quality Basin	$120,293		
		Fisheries Enhancements	$194,149		
		Recreational Trail	$253,937		
		216th Street Improvements	$2,655,387		
		South Access Area	$242,627		
		Utility Work	$1,901,872		
		Total Costs	**$7,884,695**		
		Total Benefits		**$0**	
2	2027	Mobilization/Demobilization	$471,506		
		Construction Survey	$42,792		
		Construction Quality Control Material Testing	$25,358		
		Erosion Control Measures	$83,207		
		Site Clearing	$0		
		Water Management Control	$23,773		
		Bank Excavations	$63,792		
		Main Dam Earthwork	$1,250,957		
		Principal Spillway	$481,881		
		West Water Quality Basin	$226,711		
		South Water Quality Basin	$244,232		
		Fisheries Enhancements	$194,149		
		Recreational Trail	$515,569		
		216th Street Improvements	$1,307,877		
		South Access Area	$492,606		
		Fort Street Access Area	$527,595		
		South Maintenance Road	$128,376		
		ROW Fence	$173,387		
		Seeding & Mitigation	$320,299		
		Total Costs	**$6,574,068**		
		Total Benefits		**$0**	

Project Year(s)	Calendar Year(s)	Cash Flow Categories	Costs	Benefits	Details
3	2028	OM&R	$62,784		0.5% of Total Construction Costs
		Total Costs	**$62,784**		
		Flood Damage Benefits		$236,608	
		Environmental		$1,243,280	
		Recreational		$43,997	
		Upstream Land Improvement		$2,923,297	Initial year increase in Property value
		Downstream Land Improvement		$1,414,521	Initial year increase in Property value
		Total Benefits		**$5,094,918**	
4-49	2029-2074	OM&R	$62,784		0.5% of Total Construction Costs
		Total Costs	**$62,784**		
		Flood Damage Benefits		$236,608	
		Environmental		$1,243,280	
		Recreational		$43,997	
		Total Benefits		**$1,523,885**	

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. Primary tangible benefits have been calculated and presented above.

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.

Papio NRD has planned for and budgeted the cost of the design and remaining land rights acquisition for this site in their current (FY2025) budget, as reported in their Papio NRD FY2025 Tax Levy and Adoption Budget Memorandum (Papio NRD 2024). They have a proven record of planning their budgets on an annual basis to account for the costs required for their upcoming projects.

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

Papio NRD has estimated the FY2025 property tax request at 0.029568 cents per $100 of valuation. This request indicates $31,497,102 will be available from property taxes, contributing toward a total operating budget of $89,150,425.

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

   Not applicable.

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

   The Project was designed to maximize flood control and lake-based recreation benefits. The Project's design elevation, which supports a normal pool, was evaluated to determine if a lower normal pool would support viable fisheries. A reservoir's normal pool size relative to its drainage area is called reservoir sustainability. Reservoir sustainability is the concept of designing an appropriately sized reservoir for the reservoir's contributing drainage area. The sustainability of a pool considers both the ability to maintain a pool area while maintaining a suitable water quality for aquatic habitat and to support a quality fishery within the pool. While a small pool size relative to a large watershed will be able to sustain the pool area, the water quality in that pool, as well as downstream, will likely be degraded due to higher concentrations of pollutants and dramatic changes in the nutrient disposition in the water column. This analysis determined that the normal pool EL 1206 is within the lower range of what is considered desirable for sustainability. While a higher pool would improve sustainability, additional stream and wetland impacts would occur. Therefore, the normal pool EL 1206 was considered the best option to provide sustainable fisheries while minimizing environmental impacts.

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

   Papio NRD is a regional government agency that focuses on protecting ground and surface water, reducing flood threats, slowing the effect of soil erosion, creating and enhancing wildlife habitat, and more. These flood control sites directly align with the types of projects they have a history of successful implementation, operation, and maintenance. Land rights will be acquired so that the Project will not take place on private property, and all permits will be acquired to ensure all legal facets of the Project have been covered.

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

   The 2022 update of the Nebraska State Flood Hazard Mitigation Plan (Plan) discusses the State's commitment to flood mitigation strategies and programs,

helping to reduce or eliminate potential losses from future disasters. As referenced in Plan, Papio NRD has the highest quantity of high hazard dams. Section 3.4.11.5 of the Plan recounts significant historical flooding within the Papillion Creek Watershed, including damages in Millard, Ralston, and Papillion. It also references levees and dams that have been constructed within the watershed to provide flood risk reduction. More specifically, USACE built four dams in the Papillion Creek Watershed to protect the population from major runoff events. Due to ongoing urbanization, Papillion Creek and its tributaries are currently most vulnerable to flash floods, and DS-12 is one of many structures (outlined in the PCWMP) that will provide flood risk reduction within the Papillion Creek Watershed and help achieve goals set forth in the Plan.

The NGPC Statewide Comprehensive Outdoor Recreation Plan (2021–2025) identifies goals and recommendations as a guide to achieve the desired results. The Project addresses multiple recreational needs and elements identified as desired in the Omaha-Metro area, including hiking trails and picnic areas. It also addresses a shortage of lake-based recreation in the region (based on Nebraska Resource Development Fund [NRDF] guidelines [NRDF 2000]).

As previously described, the Project has been included as part of the PCWMP since inception of the plan in 2009. DS-12 was designated as a PCWP project for FY2025 to FY2029 because of impending development and the opportunity to reduce the potential for flood damage immediately downstream of the Project.

Papio NRD completed an Environmental Protection Agency (EPA) Section 319 Water Quality Management Plan (WQMP) for the Papio-Missouri River Basin in 2018. The purpose of the WQMP is to address nonpoint source pollution and, specifically, waterbodies listed as impaired on the 303(d) list. The Project is consistent with the practices identified in the WQMP to reduce a range of surface-water-based impairments.

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.

The DS-12 site will encompass an estimated 235 acres. Papio NRD has acquired all property except for parcel #2542502500 and #0115950009. See Attachment E, Land Ownership, for a figure and table documenting current lands acquired by Papio NRD for the Project.

The parcel #2542502500 and #0115950009 landowners are aware of the Project, and the purchase is planned for Spring of 2025.

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

Papio NRD has purchased all but one of the properties. Ownership is as documented on Douglas-Omaha Geographic Information Systems (DoGIS.org) and is included in Attachment E of the SIA.

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

Papio NRD owns portions of the land and is currently undergoing negotiations with the remaining landowners for acquisition of the parcels required for construction. Papio NRD has the power of eminent domain that could be applied, if necessary.

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 Papio NRD's roles and responsibilities. Papio NRD will obtain all necessary permits and land rights to complete the Project and 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.

Environmental and ecological consequences are evaluated based on a with and without Project condition. The following resources were evaluated: wetland resources, stream resources, fishery habitat, terrestrial habitat, and surface water quality.

Wetland Resources: Wetlands provide a number of functions within a watershed, including habitat for a variety of species, water quality, flood attenuation, and vegetative diversity. The Project will impact approximately 9.5 acres of wetland. However, approximately 28 acres of wetland habitat will be created.

Stream Resources: Streams provide a number of functions in a watershed, including providing in-stream habitat, riparian habitat, and floodplain connectivity. An assessment of the existing and post-Project stream function was performed, and it was determined that, although types of functions will change, the post-Project stream function will increase.

Fishery Habitat: Construction of DS-12 will result in the conversion of the existing stream habitat into lake habitat. This is viewed as an improvement because it will result in a more diverse aquatic ecosystem within the Project area without affecting downstream habitat. A mix of water depths will exist in the normal pool EL 1206. Based on current elevation without grading distribution, the size of the proposed pool is:

- 0 to 4.9 feet – 16 acres
- 5 to 20 feet – 25 acres

The existing aquatic habitat does not support a diverse selection of aquatic species. This is due to diminished flows, a deeply incised channel, human-created debris along the banks, severe erosion, and poor water quality, especially due to runoff from agricultural lands during precipitation events. DS-12 will provide a permanent aquatic habitat for fish and other aquatic organisms.

Terrestrial Habitat: The current land use around the Project area is predominantly agricultural. The upland areas surrounding the lake will be designed for wildlife habitat. NGPC provided guidance regarding additional design features conducive to upland wildlife. Some of the features include shrub plantings for nesting areas and food sources, grassland plantings to include wildflower areas and native grass species, log piles and brush piles in designated areas to provide cover habitat for a variety of species, nest boxes for a variety of bird species, tree snags, and potentially bat boxes. Existing trees located outside the normal pool will remain to provide some nesting habitat for a variety of species. Food plots will not be planted to attract deer, due to the residential developments bordering the area and the potential future development of surrounding lands, which may become an issue for an urban deer population.

The area will offer habitat to a variety of amphibians, reptiles, mammals, and aquatic birds. Improved wetland habitat will naturally recruit garter snakes, black rat snakes, and ring-neck snakes to the area. The site will also offer a potential haven to migratory waterfowl and raptors. The area will be protected in perpetuity and provide a refuge for those species that currently live in the agricultural areas that will be developed in the future.

Water Quality: The State of Nebraska classifies surface waters of very high quality as state resource waters. Class A state resource waters are those within national or state parks, wildlife refuges, or wild and scenic river systems. Class B state resource waters possess an exceptionally high water quality that exceeds levels necessary to support the designated uses (Nebraska Department of Environment and Energy [NDEE] 2023). None of the streams in the Project area are classified by the State of Nebraska as state resource waters.
West Papillion Creek (MT1-10260) is only assessed by NDEE approximately 1,500 feet upstream of 204th Street as supported beneficial use for aesthetics and agricultural water. This reach is designated as a Category 3, where there is

insufficient data to determine if any beneficial uses are being met. There are no known impairments or pollutants of concern (NDEE 2023).

The Project will have beneficial effects on water quality. Two water quality basins are proposed as part of the project in addition to the primary dam site reservoir. 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 those, such as phosphorus, that have the affinity to adhere to sediment particles that will settle out. When designed correctly, water quality basins can also reduce the dissolved pollutant loads through biological uptake of wetland vegetation. A water quality basin can also extend the time it takes for water to transfer into the lake, 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.

The reservoir itself will further reduce sediment, nutrient, and bacteria transport downstream. In addition, downstream habitat is improved and protected. As the watershed develops, land is covered with impervious surfaces, such as roads, parking lots, roofs, driveways, and sidewalks, that prevent rainfall from infiltrating into the ground. The reservoirs cause a decrease in stormwater runoff flow rate, volume, and velocity, which decreases erosion and sediment deposition. Altering the magnitude, frequency, and duration of stormwater runoff and sediment loads to streams reduces impacts on water quality and loss of aquatic life and habitat through a variety of geomorphic mechanisms. These mechanisms include fewer changes in channel bed material, decreased suspended sediment loads, gains of riparian habitat due to decreases in streambank erosion, and decreases in the variability of flow and sediment transport characteristics relative to aquatic life cycles.

Section C.

NRC SCORING

In the Natural Resources Commission's (NRC) 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 to 6 for items (1) - (9); and 0 to 3 for items (10) - (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 72 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.

   By virtue of trapping sediments, nutrients, and bacteria in an urban area, these reservoirs will improve downstream water quality of raw water drawn for potable

use. This includes improvements to Plattsmouth, Nebraska City, and all other communities currently drawing water from the Missouri River, as well as those communities that have plans to take water from the Missouri River in the future. Additionally, these reservoirs will help mitigate the impact of urban runoff, reducing the presence of harmful contaminants and ensuring safer drinking water for residents. Over time, this will contribute to the overall health and sustainability of the region's water supply, benefiting both the environment and public health.

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.

   Papio NRD's first Integrated Management Plan (IMP) was developed in 2014 and jointly adopted by Papio NRD and the Nebraska Department of Natural Resources (NeDNR). This Projects 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. The Project will protect downstream water and groundwater uses. The reservoir will naturally recharge groundwater and provide a steady baseflow downstream.

   DS-12 is part of the 2009 PCWMP issued by PCWP and supports 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.
   4. Provide erosion and sediment control through storing sediment.

   DS-12 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. The reservoir will also provide recreational activities with a pedestrian trail circling the reservoir pool and public access areas with parking and water access. Areas surrounding the reservoir will be preserved as greenspace and not subject to development. Finally, the water quality basins will trap and prevent the sediment from downstream transportation.

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.

Papio NRD and NeDNR jointly adopted a voluntary IMP in August 2014. Actions to meet the goals and objectives of the IMP are underway. Goal 1 is to develop and implement water use policies and practices that better protect existing surface and groundwater uses while allowing for future development. Rules and regulations restricting the amount of groundwater and surface water development have been adopted by Papio NRD and NeDNR, and the existing Groundwater Management Plan (circa March 1994) has been updated to adopt changes in February 2018 to be consistent with the IMP.

DS-12 is part of the PCWMP and will help to achieve Goal 1, Objective 1.1, of the IMP. Based on the geotechnical investigations completed during the preliminary design, groundwater was encountered within the alluvial valley at depths ranging from 1.0 to 7.0 feet below the existing ground, and in the uplands at depths generally ranging between 7 and 46 feet below existing ground.

DS-12's construction will create a 43-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 provide a steady volume of stream flow by temporarily detaining runoff from precipitation events, slowly metering the flood volume out of reservoir storage over time through the principal spillway. The resulting discharge hydrograph from the reservoir results in a much lower peak flow (and subsequently, peak water surface elevations) in the reaches downstream of the storage reservoir. Furthermore, because urban development within a watershed 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 the 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, DS-12 can help meet Eastern Nebraska's water sustainability goals.

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.

Flood Control

Beginning with a flood control study initiated by USACE in 1967, multiple dam sites within the Papillion Creek Watershed were identified, and many were constructed to reduce flood damages within the watershed. In 2009, the PCWMP built upon this study and included regional detention basins and water quality basins to provide flood control, recreation, and water quality benefits in Douglas and Sarpy Counties (HDR 2009). Figure 3 in Attachment C of the SIA provides the implementation status of the various dam sites, detention basins, and water quality basins.

Papillion Creek flood management includes storage reservoirs, channel improvements, and levees. Storage reservoirs and levee and channel improvements affect the runoff response, or the hydrograph (a plot of the variation of discharge with respect to time), in different ways. Storage reservoirs provide flood mitigation benefits by temporarily detaining runoff from precipitation events and slowly metering the flood volume out of reservoir storage over time through the principal spillway. The resulting discharge hydrograph from the reservoir results in a much lower peak flow (and subsequently, peak water surface elevations) in the reaches downstream of the storage reservoir (see Exhibit 1 below).

Channel improvements and levees generally increase the peak flow velocities through the system by removing obstructions, eliminating interaction with overbank areas, and increasing the efficiency of the channel in conveying flows. The effect on the runoff hydrograph is typically a steeper rising limb and shorter duration (see Exhibit 1 below).

The effectiveness of the structural measures in the Papillion Creek Watershed is crucially dependent on how each one impacts the timing of the hydrographs and how they collectively enhance the overall flood mitigation system. The storage measures detain peak flows from the upper watershed and release them over an extended period, greatly attenuating peak flows from the upper portion of the basin. In the lower reaches of Papillion Creek, conveyance improvements steepen the rising limb of the hydrograph and shorten the time lag (that is, the conveyance improvements allow evacuation of runoff from the lower portion of the watershed prior to the upstream peak flows reaching the area). Exhibit 1 illustrates the storage reservoir and channel improvement effects on flood hydrographs.

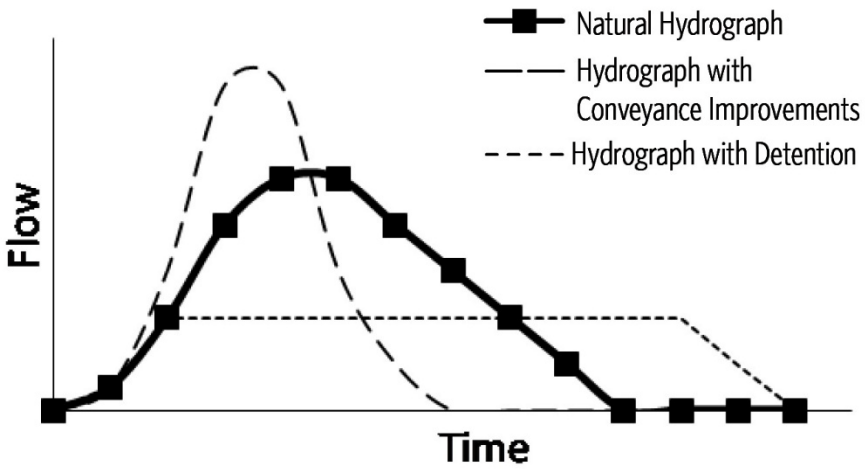

Exhibit 1. Conceptual Papillion Creek Hydrographs

The Project is one of the remaining flood control structures to be constructed in the upper portion of the West Papillion Creek Watershed, and it will not only provide direct flood damage reduction benefits, but also function in concert with the overall timing of the hydrograph downstream during runoff events. The Project will provide a reduction in the 100-year peak flow at the Project site from approximately 2,480 cfs to 300 cfs at the principal spillway outflow.

The Project will provide significant flood reduction within the sub-watershed and contribute to a reduction in the West Branch Papillion Creek, which currently inundates portions of Elkhorn and downstream from the 100-year flood event. Figure 5 in Attachment C in the SIA provides the full build-out 100-year floodplain downstream of the Project. The affected reach contains 740 acres of full build-out 100-year floodplain, and 311 structures are located within this floodplain.

Flood control benefits are maximized when protection can be achieved in high value areas. No other area in the state has land and improvement values as high as those in this watershed, driven by the rapid development occurring around these reservoirs, which is also the highest in the state. Without the reservoirs identified in the PCWMP (HDR 2009), costly levee modifications and bridge raises will be required to bring the West Branch levees into FEMA compliance.

Recent studies have shown the extensive socioeconomic impact of flooding on communities. Projects such as these reduce the threats to the general security, health, and safety of the public by reducing the threat of flood impacts. This benefit can be observed in a reduced need for emergency operations and rescue services during flooding and due to a reduction in health hazards such as odor, insects, and other negative impacts of flooding. Lost production time for businesses (income losses) has also been quantified and plays a significant role in tabulating total losses.

Recreation

The Nebraska NRDs' authorized purposes are outlined in Nebraska Revised Statutes 2-3229. The statutes direct the districts to develop and execute programs related to recreation, in addition to programs related to flood control, soil conservation, and water supply. Specifically, the recreation-authorized purposes are development and management of fish and wildlife habitat and development and management of recreational and park facilities. Papio NRD has a Public Agency Coordination Policy that directs the agency to include, when feasible, amenities in flood control projects for public access including, but not limited to, trail corridors, park areas, water-based recreation, and/or wildlife habitat.

One of the Project's purposes is to provide recreation, specifically lake-based recreation. A detailed analysis of supply of and demand for lake-based recreation was conducted using methodologies that follow NRDF guidelines (NRDF 2000). NRDF guidelines provided methods for calculating the recreational benefits received from fulfilling the unmet demands of lake-based recreational activities. This analysis indicates that, within the recreation market area (the RMA; a 20-mile radius from the Project area), there is unmet demand for several recreational activities, including: tent camping, recreational vehicle camping, hiking, canoeing/non-power boating, picnicking, baseball, sailing, and playgrounds. The RMA has an abundance of lake and reservoir fishing, ice fishing, nature enjoyment, and areas for viewing and photographing wildlife (see Table C-1).

Table C-1 – Recreation Supply and Demand

Activity	Units	Total Demand (Units)1	Total Supply (Units)2	Unmet Demand (Units)
Tent camping	Sites	991	252	-739
Recreational vehicle camping	Sites	740	421	-319
Hiking	Miles	585	178	-407
Lake and reservoir fishing	Acres	684	4,517	+3,833
Canoeing/non-power boating	Acres	43,833	3,547	-40,286
Picnicking	Tables	1,847	669	-1,178
Baseball	Fields	681	373	-308
Sailing	Acres	8,028	3,547	-4,481
Ice fishing	Acres	926	3,343	+2,417
Playground	Sites	306	293	-13
Enjoy nature	Acres	16,550	27,579	+11,029
Viewing and photographing wildlife	Acres	8,944	27,579	+18,635

Notes:

1 *Total demand analysis uses a combination of data from the 2000 NRDF Guidelines, data provided by Kris Reed from NeDNR in 2010, and the Nebraska 2016 Statewide Comprehensive Outdoor Recreation Plan (SCORP).*

2 *Total supply data uses a variety of internet resources including State, County, and City websites and Google Earth™ mapping service.*

The demand for these activities suggests that recreation activities specific to lakes and/or reservoirs is needed within the RMA, and the Project will partially satisfy these needs.

Water Quality

The Project will have beneficial effects on water quality. In addition to the primary dam site reservoir, two water quality basins are proposed as part of the Project. 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 those, such as phosphorus, with the affinity to adhere to sediment particles that will settle out. When designed correctly, water quality basins can also reduce dissolved pollutant loads through biological uptake of wetland vegetation. A water quality basin can also extend the time it takes for water to transfer into the lake, providing additional die-off time for bacteria. Any increase in surface area provided by the water quality basin provides more ultraviolet light exposure, which kills bacteria.

The reservoir itself will further reduce sediment, nutrient, and bacteria transport downstream. In addition, downstream habitat is improved and protected. As the watershed develops, land will be covered with impervious surfaces, such as roads, parking lots, roofs, driveways, and sidewalks, that prevent rainfall from

infiltrating into the ground. The reservoirs cause a decrease in stormwater runoff flow rate, volume, and velocity, which decreases erosion and sediment deposition. Altering the magnitude, frequency, and duration of stormwater runoff and sediment loads to streams reduces impacts on water quality and loss of aquatic life and habitat through a variety of geomorphic mechanisms. These mechanisms include fewer changes in channel bed material, decreased suspended sediment loads, gains of riparian habitat due to decreases in streambank erosion, and decreases in the variability of flow and sediment transport characteristics relative to aquatic life cycles.

Wildlife Habitat

Construction of DS-12 will result in the conversion of the existing stream habitat into lake habitat. This is viewed as an improvement because it will result in a more diverse aquatic ecosystem within the Project area without affecting downstream habitat. A mix of water depths will exist within the normal pool. Based on current elevations without grading distribution, the areas of the proposed pool depths are:

- 0 to 4.9 feet – 16 acres
- 5 to 20 feet – 25 acres

The existing aquatic habitat does not support a diverse selection of aquatic species. This is due to diminished flows, a deeply incised channel, human-created debris along the banks, severe erosion, and poor water quality, especially due to runoff from agricultural lands during precipitation events. DS-12 will provide a permanent aquatic habitat for fish and other aquatic organisms.

The current land use around the Project area is predominantly agricultural. The upland areas surrounding the lake will be designed for wildlife habitat. NGPC provided guidance regarding additional design features conducive to upland wildlife. Some of the features include shrub plantings for nesting areas and food sources, grassland plantings to include wildflower areas and native grass species, log piles and brush piles in designated areas to provide cover habitat for a variety of species, nest boxes for a variety of bird species, tree snags, and potentially bat boxes. Existing trees located outside the normal pool will remain to provide some nesting habitat for a variety of species. Food plots will not be planted to attract deer, due to the residential developments bordering the area and the potential future development of surrounding lands, which may become an issue for an urban deer population.

The area will offer habitat to a variety of amphibians, reptiles, mammals, and aquatic birds. Improved wetland habitat will naturally recruit garter snakes, black rat snakes, and ring-neck snakes to the area. The site will also offer a potential haven to migratory waterfowl and raptors. The area will be protected in perpetuity and provide a refuge for those species that currently live in the agricultural areas that will be developed in the future.

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.

   Flood control is a primary concern for Nebraskans in highly urbanized areas. DS-12 is 1 of the 14 originally planned structures that, once constructed, will provide collective flood control benefits for homes, businesses, and industries; provide much needed lake-based recreation; and provide additional benefits from water quality improvement, streambank stabilization, and recreational opportunities within Nebraska's most populous area.

   The Project also provides recreational opportunities, habitat improvement, and water quality enhancement benefits to Nebraskans. Recreational amenities, such as the 1.7-mile-long multi-use trail, picnic shelters and tables, vault restrooms, concrete boat ramp, kayak access, concrete parking, and solar lighting encourages public use and benefits public health. In-lake features will enhance the reservoir's aquatic habitat. This area will become an attraction for recreational use and improve the region's economy by bringing people to the area.

   In addition to the 40-acre reservoir, approximately 28 acres of wetland habitat and 155 acres of upland habitat will be created.

   No beneficial uses will be reduced.

   This Project not only reduces the threat of flooding, but also enhances Nebraskans' ability to enjoy the state's water resources in a highly urbanized area. Additionally, it promotes community engagement and awareness about the importance of sustainable water management practices. By integrating flood control with environmental and recreational benefits, the Project contributes to the overall well-being and quality of life for residents.

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.

Table C-2 provides a summary of total Project costs as they pertain to the benefit-cost analysis. Table 10 of Attachment F of the SIA identifies all Project costs and benefits (including existing property acquisition costs).

Table C-2: Total Project BCA Costs

Summary of Costs	DS-12
Engineering Design Services	$ 845,000
Permitting	$ 10,000
Other Professional Services	$ 10,000
Total Land Acquisition	$ 12,189,500
Engineering Construction Services	$ 700,000
Construction	$ 14,458,762
Total OMR&R	$ 2,950,869
Total BCA Project Costs	**$ 31,164,132**

The Project's benefits are derived from flood damage reduction, ecosystem services, recreational opportunities, and upstream and downstream land improvement values. Table C-3 provides a summary of these monetized benefits. Attachment F of the SIA provides detail on the method used to calculate these benefits.

Table C-3: Summary of Benefits

Benefit Category	Calculated Value	# of Occurrences Over Lifetime	Lifetime Benefits
Flood Damage Reduction	$236,608	47	$11,120,578
Green Space	$1,243,280	47	$58,434,160
Recreational	$43,997	47	$2,067,852
Upstream Land Improvement	$2,923,297	1	$2,923,297
Downstream Land Improvement	$647,736	1	$647,736
Total Benefits			**$75,193,623**

The comparison of total costs ($31,164,132) to total benefits ($75,193,623) equates to a 2.41 benefit-cost ratio.

Alternatives to the Project for flood reduction in the Papillion Creek Watershed have been studied extensively by PCWP. The PCWMP (HDR 2009) developed an integrated approach to address peak flow reduction using a combination of LID and regional detention structures in the watershed. Even with incorporating LID techniques in the watershed, the reduction in the 100-year peak flow would be minimal. Therefore, it was concluded that the regional detention structures are still required to reduce flood flows and prevent associated damage.

As a result of current watershed development, this levee system no longer adheres to FEMA's criteria for the 100-year flood and required freeboard. Papio NRD performed two studies to assess flood control measures to restore the required levee freeboard: the West Papillion Creek Levee Restoration – Summary of Previous Analyses (HDR 2006) and the West Papillion Creek Levee Restoration Evaluation (HDR 2008). Like the PCWMP, these studies also considered various alternatives to reduce flooding in the watershed, and the net result of both analyses is that these sites are vital to providing flood control in the overall watershed and this sub-watershed. Site locations within the watershed were not studied. These sites represent the maximum drainage area that can be controlled in the watershed, given the current development and infrastructure in the area.

A host of flood control alternatives were considered to provide flood reduction for the full build-out 100-year floodplain downstream of West Papillion Creek. Measures included LID (as described above), wetland storage, floodplain acquisition, conveyance improvements (including levees), stream restoration, floodplain connectivity, multiple small detention dams, and a dry dam alternative. For reasons ranging from not physically being able to address flood damage reduction for the full build-out 100-year floodplain; extraordinarily high costs; and logistically not within Papio NRD's ability to implement, the proposed Project is the only reasonable alternative to address flood reduction.

The Project's purpose is also to address a shortage of lake-based recreation opportunities. Multiple alternatives to the Project were considered to address lake-based recreation. Alternatives included building new reservoirs and/or lakes in other locations within the service area of DS-12. It was concluded that, to meet the purposes of flood damage reduction and lake-based recreation, separately constructing a flood damage reduction structure and a lake-based recreation structure would be over three times as costly to receive the same benefits.

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.

Section 303(d) of the EPA's Clean Water Act aims to maintain the integrity of the Nation's waters by requiring States to identify impaired waters that do not meet water quality standards. The entire Papillion Creek system, including Little Papillion Creek, Cole Creek, Big Papillion Creek, and West Papillion Creek

tributaries, is listed as impaired for *E. coli*. The water quality improvements from this Project will help reduce *E. coli* loads, particularly in West Papillion Creek downstream of the site. This will be achieved by increasing the surface area exposed to sunlight and extending the detention time of the water, allowing for additional bacteria die-off before the water is discharged through the dam spillway system and transported downstream to the Papillion Creek system.

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.

   This Project significantly mitigates the flooding threat to the lands surrounding and downstream of the Project area by installing a main dam, water quality basins, and other improvements. It provides essential flood reduction benefits to the downstream Papillion Creek system, including transportation corridors, utilities, and other infrastructure that runs along or through the system. The modeled area of flood reduction benefits for the anticipated full-build out 100-year floodplain is illustrated in Figure 5 in Attachment C of the SIA. Using 2020 parcel data, an estimated 311 parcels and a total of 740 acres are anticipated to experience fewer flood damages. The value of these benefits was calculated based on an average benefit to watershed basin approach and is estimated to be $236,608 annually (see Attachment F of the SIA).

   While it is challenging to quantify the flood reduction benefits to utilities along the Papillion Creek system, the Project offers substantial protection. This proactive initiative prevents flooding from affecting future developments around DS-12. By eliminating and reducing the risk of property damage from flooding for both existing and future developments, this Project enhances the public security, public health, and safety of Nebraska communities.

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.

The State of Nebraska classifies surface waters of very high quality as state resource waters. Class A state resource waters are those within national or state parks, wildlife refuges, or wild and scenic river systems. Class B state resource waters possess an exceptionally high water quality that exceeds levels necessary to support the designated uses (NDEE 2023). None of the streams in the Project area are classified by the State of Nebraska as state resource waters. West Papillion Creek (MT1-10260) is only assessed by NDEE approximately 1,500 feet upstream of 204th Street as supported beneficial use for aesthetics and agricultural water. This reach is designated as a Category 3, where there is insufficient data to determine if any beneficial uses are being met. There are no known impairments or pollutants of concern (NDEE 2023).

The Project will have beneficial effects on water quality. In addition to the primary dam site reservoir, two water quality basins are proposed as part of the Project. 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 those, such as phosphorus, with the affinity to adhere to sediment particles that will settle out. When designed correctly, water quality basins can also reduce dissolved pollutant loads through biological uptake of wetland vegetation. A water quality basin can also extend the time it takes for water to transfer into the lake, providing additional die-off time for bacteria. Any increase in surface area from water quality basin provides more ultraviolet light exposure, which kills bacteria.

The reservoir itself will further reduce sediment, nutrient, and bacteria transport downstream. In addition, downstream habitat is improved and protected. As the watershed develops, land will be covered with impervious surfaces, such as roads, parking lots, roofs, driveways, and sidewalks, that prevent rainfall from infiltrating into the ground. The reservoirs cause a decrease in stormwater runoff flow rate, volume, and velocity, which decreases erosion and sediment deposition. Altering the magnitude, frequency, and duration of stormwater runoff and sediment loads to streams reduces impacts on water quality and loss of aquatic life and habitat through a variety of geomorphic mechanisms. These mechanisms include fewer changes in channel bed material, decreased suspended sediment loads, gains of riparian habitat due to decreases in streambank erosion, and decreases in the variability of flow and sediment transport characteristics relative to aquatic life cycles.

Under current land uses of the watershed upstream of DS-12, other possible solutions to address pollutant loading include typical best management practices

and conservation measures, including buffer strips, sediment basins, and outreach and education related to fertilizer applications. However, as land use in the basin upstream of DS-12 changes from agricultural to urban development, opportunities for buffer strips and sediment basins will diminish. Education and outreach related to fertilizer use and pet waste management will remain important. With increases in the number of impervious surfaces, pollutant loading in stormwater runoff will continue and could increase due to increased stormwater runoff.

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 primary Project sponsor is Papio NRD, with additional support from the City of Omaha, Douglas County, PCWP, and NGPC for design, construction, and administration. Letters of support can be found in Attachment B of the SIA. Papio NRD regularly leads large-scale projects and is well-equipped to implement this proposed initiative. This Project is a collaborative effort under the PCWP, which includes nine local governments that have contributed resources to the PCWMP, recognizing the importance of proactive stormwater management. The Project's anticipated funding sources are detailed in Section A.5, Table A-1.

Papio NRD currently levies a tax rate of $0.029568 per $100 of valuation, generating nearly $31.5 million in property tax income.

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.

Papio NRD is the primary local jurisdiction responsible for the construction of DS-12. The Project is part of the PCWMP developed for the PCWP, a coalition of nine jurisdictions focused on stormwater management, peak flow reduction,

pollution control, floodplain management, landscape preservation, and erosion and sediment control. The PCWMP was last revised in 2019 and is in the process of being revised in 2024–2025.

In August 2014, Papio NRD and NeDNR jointly adopted a voluntary IMP. The first goal of the IMP is to develop and implement water use policies and practices that protect existing surface and groundwater uses while allowing for future development. The DS-12 project is a key action step toward achieving this goal. Papio NRD and NeDNR have established rules and regulations to limit groundwater and surface water development each year, and Papio NRD updated its Groundwater Management Plan in February 2018 to align with the IMP.

In Eastern Nebraska, maintaining watershed health and sustainability is closely linked to reducing flood damage. The primary sustainable practices for this Project include flood control, water quality improvements, floodplain regulation management, and habitat enhancement, all of which contribute to healthy watersheds. The value of land and improvements in this watershed are among the highest in the state due to rapid development around the reservoirs. The benefits of these projects extend not only to those protected downstream but to all Nebraskans, as the area continues to grow sustainably and support Nebraska's economy. The local jurisdictions that manage and enforce these practices are the individual municipalities participating in the PCWP, including the City of Omaha and Papio NRD. Residents, businesses, and visitors to the Omaha metropolitan area will benefit from the implementation of the PCWMP, primarily through flood risk reduction and recreational opportunities in a growing urban landscape.

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.

As dramatically demonstrated by the 2019 floods that occurred in many parts of Nebraska, flooding is a significant, statewide issue. This Project aims to reduce the flooding threat in the state's most densely populated area, thereby alleviating the potential need for local, State, and federal resources for response and recovery after a major flood. The 2022 State Hazard Mitigation Plan focuses on themes such as prevention, property protection, public education and awareness, natural resource protection, and structural projects. The Project aligns with the following themes:

- **Prevention:** Planning in 2009 secured open space for the construction of multiple flood retention structures. Papio NRD is moving forward with building DS-12 before development or other unforeseen complications arise.
- **Public Education and Awareness:** Through PCWP's efforts, the public and property owners have been educated continuously on the goals of reducing flooding and improving water quality. DS-12 will include signage to further this message and acknowledge the NRC as a funding support source.
- **Natural Resources Protection:** Stream stabilization will reduce threats to infrastructure and enhance natural amenities within an urbanized area, fostering a connection between people and nature.
- **Structural Projects:** This Project directly addresses this theme by constructing structures, including dams, to mitigate the impact hazards.

The Project will provide flood damage reduction for approximately 740 acres of full build-out 100-year floodplain downstream of the proposed DS-12 location. There are approximately 311 structures within this area. The value of these benefits was calculated based on an average benefits to watershed basin approach and is estimated to be $236,608 annually (see Attachment F of the SIA).

Additionally, the Project will provide ancillary benefits to the State by increasing recreational amenities at the site, which can attract tourists and visitors, thereby boosting economic prosperity and complementary development.

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.

There are two funding partners currently identified for this Project: Papio NRD and NGPC. NGPC is anticipated to contribute Federal Sports Fish Restoration Program and Motorboat Access Program funding for elements, such as deepening the reservoir to maintain a fishery, angler access, offshore breakwater, and a public access area.

In addition, The City is a funding partner related to long-term maintenance and operation of the site. The City will manage the recreational facilities located at the site upon Project completion. Douglas County will contribute to the transportation

infrastructure related to the relocation of 216th Street. The roadway type will be coordinated during final design, and cost-sharing will be established at that time.

NRC will become the third and most critical funding partner, allowing the Project to proceed to construction in 2026. The contributing amounts from each funding partner and the sources of these funds is shown in Table C-4. As a local government, NRDs can leverage local resources with State and federal resources, creating a collaborative funding partnership that enables large-scale projects, such as DS-12, to become a reality. Letters of commitment from NGPC and the City of Omaha are provided in Attachment B of the SIA.

These partnerships allow Papio NRD to maximize both their 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 or Douglas County are unable to fulfill their funding obligations, Papio NRD will allocate budget from its General Fund to complete the Project elements, but the Project may be delayed. The City's funding obligation is for long-term operations an management and will not affect the Project schedule.

Table C-4: Project Cost and Funding Source Summary

Item	Cost Estimate	NGPC Share	Papio NRD Share	Total Local Cost Share	WSF Grant Request (60%)
Engineering Design Services	$845,000		$338,000	$338,000	$507,000
Permitting	$10,000		$4,000	$4,000	$6,000
Other Professional Services (Administrative, Legal, Fiscal)	$10,000		$4,000	$4,000	$6,000
Land Acquisition	$500,000		$200,000	$200,000	$300,000
Engineering Construction Services	$700,000		$280,000	$280,000	$420,000
Construction	$14,458,762	$250,000	$5,533,505	$5,783,505	$8,675,257
Totals	$16,523,762	$250,000	$6,359,505	$6,609,505	$9,914,257

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.

The project site is situated in the northern portion of the Papillion Creek Watershed within the West Papillion Creek Sub-watershed and on West Papillion Creek, which drains southeast through the Omaha metropolitan area and then discharges into Papillion Creek. The contributing drainage basin area above DS-12 is approximately 2.6 square miles. Land use within the majority of the

West Papillion Creek Sub-watershed is transitioning from agricultural land to urban land uses, including single-family residential and commercial development.

The new dam will significantly enhance watershed health and function by:

- **Increasing water storage**: Surface water storage within the reservoir will create a natural filter for pollutants and contribute to groundwater recharge by slowing water flow to allow more water to infiltrate the ground.
- **Provide flood control**: DS-12 will regulate water flow to prevent downstream flooding, protecting the Omaha area, communities southward, and ecosystems from flood damage.
- **Provide erosion and sedimentation control**: DS-12 will provide a natural area to trap sediments, nutrients, and bacteria, which will improve water quality downstream and reduce sedimentation in other water bodies. The erosion and sedimentation control provided by DS-12 will help prevent damage in aquatic life and reduce damage to the overall health of riparian areas.
- **Foster habitat creation**: DS-12 will provide an overall increase in stream habitat stability and become a new habitat for various aquatic and terrestrial species in this developing area.

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 2024 Annual Report defines six strategic goals. The following describes how the Project will meet these goals:

Goal 1 – Establish strong State leadership, involvement, and support for science-based decision-making that is necessary to sustain State and local water management outcomes.

The Project is an outcome of the PCWMP that included a significant amount of hydrologic data, such as streamflow, streams, watershed, drainage models, floodplain, and pollutant loading information provided by NeDNR, NDEE, USGS, and other entities. The Project built on this data to inform the feasibility of the Project and culminated in the Preliminary Engineering Report (see Attachment D of the SIA).

Goal 2 – Provide high-quality products and services through the performance of our duties in the areas of floodplain management, flood mitigation planning, dam safety, and survey to promote the safety of all Nebraskans.

Consistent with the floodplain mitigation products that NeDNR provides, the Project reflects one of Papio NRD's missions, which is to provide flood control for the District, and specifically the Papillion Creek Watershed. 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. Papio NRD, 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, WP-6, WP-7, WP-4, and WP-1. These projects, plus several other proposed dam sites, combined provide the collective flood risk reduction and recreation benefits planned by PCWP since 2009 (see Figure 3 in Attachment C). Through the PCWMP's collaborative planning effort, Papio NRD is implementing projects to promote the safety of its citizens.

Goal 3 – Develop and implement customized and decentralized water management plans established through collaboration with local Natural Resources Districts and stakeholders that provide for long-term sustainability of the state's water resources.

As an element of the PCWMP, the Project is an integral part of the implementation of the vision for Papillion Creek Watershed flood control. Implementation of this component of the PCWMP will provide much needed flood risk reduction and provide for sustainable water resources management.

Goal 4 – Encourage strong public engagement with multiple constituents and stakeholder groups in planning and implementation activities to ensure that local and State needs are addressed.

Since 2001, the PCWP has improved stormwater and floodplain management by implementing projects identified in the PCWMP. Specifically, PCWP members consist of the cities of Bellevue, Boys Town, Gretna, La Visa, Omaha, Papillion, and Ralston; Sarpy County; and Papio NRD. 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. PCWP recognized the need for proactive stormwater management by identifying areas for detention structures and water quality basins before urban development occurs. Projects that provide regional detention and water quality benefits, such as the 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, preempt 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.

Outdoor recreation has also been documented as a need in the Omaha metropolitan area. This Project will provide much needed lake-based recreation opportunities through establishing a permanent 43-acre reservoir. The Project will also provide other local outdoor recreational opportunities and amenities, such as a 1.7-mile-long multi-use trail, picnic shelters and tables, vault restrooms, a concrete boat ramp, kayak access, concrete parking, and solar lighting, to encourage public use and provide public health benefits.

Goal 5 – Protect existing water uses through collaborative investments in water resource projects, planning, administration, and permitting of surface water rights, and the registration of groundwater wells.

The collaborative investment in this Project will improve West Papillion Creek's water quality. Downstream from the DS-12 location, West Papillion Creek (MT1-10260) is only assessed by NDEE as supporting beneficial uses for aesthetics and agricultural water (NDEE 2023). Through the construction of the two water quality basins and the primary dam site reservoir, sediment will be trapped, preventing downstream migration of pollutant loads during storm runoff events.

Goal 6 – Provide agency-wide services and support in the areas of information technology and transparent data sharing, business improvement, public information, and administration of state-aid funds in conjunction with the Natural Resources Commission.

Papio NRD has a robust public education program. Papio NRD will routinely inform the public about the Project through their website and various social media outlets. In addition, information on the Project will be shared with the partners for this Project (members of the PCWP, NGPC, and City of Omaha).

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.

    Not applicable.