



Design Services by:



Application Preparation by:



**Water Sustainability Fund Application
 West Branch Papillion Creek Regional
 Detention Structure 1 (WP 1)
 July 31, 2018**

Enclosed in this document, in its entirety, is an application for the Nebraska Natural Resources Commission's (NRC) Water Sustainability Fund that has been divided into four categories.

The **Cover Letter** introduces the project and states the Applicant's intent.

The **Application** follows the format in the Application Form provided by the NRC answering all questions and requests for information in Sections A, B, C and D. The responses and information provided are intended to address the information requested as directly as possible.

The Application references the **Supplemental Information Attachment (SIA)** where supporting documentation and additional information is contained. The SIA provides additional data and references to support the responses offered in the Application. The information in the SIA is provided in the same order and is numbered the same manner as in the Application. Note that not all sections of the Application will have information included in the SIA.

At the end of the SIA is a **Bibliography** for all external reports, design guidance or other material referenced in the Application. This Bibliography provides the reviewer with additional references relevant to the Application. The combined size of these references prohibits the inclusion of the references within the SIA PDF. Digital copies of the references have been included as part of this submittal. The information provided in the Bibliography is alphabetical, but each entry is cross referenced back to the Application/SIA section to which it pertains and is referenced.

Cover Letter

Application

Supplemental Information Attachment

Bibliography

COVER LETTER



July 31, 2018



Mr. Jeff Fassett, P.E.

Director, Nebraska Department of Natural Resources

via Electronic Submission

Re: P-MRNRD Papillion Creek Watershed Flood Control Dam Site WP-1

Application for Water Sustainability Fund Grant

Director Fassett and members of Natural Resources Commission:

In accordance with the rules, regulations and guidelines for Nebraska's Water Sustainability Fund Grant Program, please accept this grant application on behalf of the Papio-Missouri River Natural Resources District (P-MRNRD) for the above-referenced project.

This project is important because it is part of a larger project designed to maximize flood control as a system. The majority of the other watershed components have already been constructed. Our NRD is constructing the few remaining parts of this project as funds are available and with NRCS' Regional Conservation Partnership Program (RCP) funding recently obtained for this project, an award from the Commission will allow us to continue implementing this much needed project. The multi-governmental partnership of Federal, State and Local funding is part of what made this project attractive to NRCS and confirmed their commitment in continuing to bring Federal dollars to this watershed and to Nebraska.

Through this application, and more so in the supporting materials, the benefits of this dam working within the system is detailed. As is often the case in flood control projects, the value of the system is greater than the sum of the individual components. For that reason, this project is looked at as an individual contributor to a system of multiple dams. The costs and benefits of this system are assessed together, and prorated out to each site by its individual contribution. The commitment of multiple past funding partners on all governmental level provides a great foundation to the commitment of our NRD to complete this watershed project, hopefully including the Water Sustainability Fund and therefore all Nebraskans.

In addition to the application form posted on the NDNR website, which has been copied verbatim into this grant application, there is also an attachment referenced as the Supplemental Information Attachment (SIA) to this application. Contained within the SIA is a bibliography of technical documents related to the project that contain additional information that can be reviewed if desired. In an effort to keep this application as concise as possible, Kent Zimmerman at NDNR will be provided an electronic copy of all of the documents referenced in the bibliography and therefore, copies of said information can be obtained through Mr. Zimmerman. The goal of this application

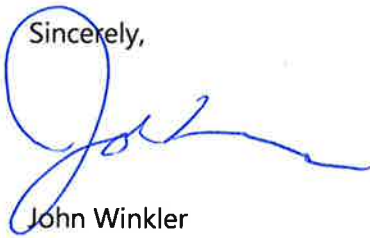
structure was to first provide reviewers with the information required to directly answer the questions in the official application form at a concise level, second to provide additional maps, charts and supporting documents to address the required information in the SIA, and then finally to provide the overall documents that any information provided originates from (assuming it is from another document.) We trust that this allows you to quickly review the information you desire and gather additional data as each individual reviewer sees fit.

"Water Sustainability" is defined in Nebraska Title 264 as when water use is sustainable when current use promotes healthy watersheds, improves water quality, and protects the ability of future generations to meet their needs.

Recognizably, sustainability has varied meanings across the State, in Eastern Nebraska, watershed health is related to reducing the threat of flood damage first and foremost. Nearly every watershed plan in this region addresses flood control first. And as argued above, finding any project that would protect the ability of future generations to meet their needs would be difficult, given the protection this project provides to one of Nebraska's thriving communities and contributor to the State economy.

We thank you for your acceptance of this application and stand ready to provide any clarification on any information provided during your review.

Sincerely,



John Winkler

General Manager, P-MRNRD

Cover Letter

Application

Supplemental Information Attachment

Bibliography

APPLICATION



NEBRASKA NATURAL RESOURCES COMMISSION

Water Sustainability Fund

Application for Funding

Section A.

ADMINISTRATIVE

PROJECT NAME: West Branch Papillion Creek Regional Detention Structure WP-1

PRIMARY CONTACT INFORMATION

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

Contact Name: John Winkler, General Manager

Address: 8901 S. 154th Street, Omaha, NE 68138

Phone: 402.444.6222

Email: jwinkler@papionrd.org

Partners / Co-sponsors, if any: Natural Resources Conservation Service, Environmental Protection Agency, Nebraska Game and Parks Commission, City of Omaha, Douglas County

1. Dollar amounts requested: (**Grant**, ~~Loan~~, or ~~Combination~~)

Grant amount requested. \$ 4,735,048 (See SIA Section A-1, Table A.1.1)

Loan amount requested. \$ N/A

If Loan, how many years repayment period? N/A

If Loan, supply a complete year-by-year repayment schedule. N/A

Are you requesting less than 60% cost share from the fund? No

If so what %? N/A

2. Permits Needed - Attach copy for each obtained (N/A = not applicable)

WP-1 is currently in the final design and permitting phase and all efforts to obtain the required permits for this site is in progress. Coordination required for Threatened and Endangered Species and Cultural Resources is being performed under the US Army Corps of Engineers (USACE) 404 permitting and NRCS Plan update process. In addition to the permits listed below, a grading permit from Douglas County and NPDES permit will be required. Consultation has begun on all permits when possible. The remainder require final plans and specifications before a permit application can be made.

Nebraska Game & Parks Commission (G&P) consultation on Threatened and Endangered Species and their Habitat	N/A <input type="checkbox"/>	Obtained: YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>
Surface Water Right	N/A <input type="checkbox"/>	Obtained: YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>
USACE (e.g., 404 Permit)	N/A <input type="checkbox"/>	Obtained: YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>
Cultural Resources Evaluation	N/A <input type="checkbox"/>	Obtained: YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>
Other (provide explanation below) Floodplain development permit	N/A <input type="checkbox"/>	Obtained: YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>

3. Are you applying for funding for a combined sewer over-flow 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

If yes attach a copy to your application. [Click here to enter text.](#)

If yes what is the population served by your project? [Click here to enter text.](#)

If yes provide a demonstration of need. [Click here to enter text.](#)

If yes and you were approved for funding in the most recent funding cycle, then resubmit the above information updated annually but you need not complete the remainder of the application.

4. If you are or are representing an NRD, do you have an Integrated Management Plan in place, or have you initiated one?

N/A YES NO

5. Has this application previously been submitted for funding assistance from the Water Sustainability Fund and not been funded?

YES NO

If yes, have any changes been made to the application in comparison to the previously submitted application?

If yes, describe the changes that have been made since the last application.

No, I certify the application is a true and exact copy of the previously submitted and scored application. (Signature required)

Section B.

DNR DIRECTOR'S FINDINGS

Does your project include physical construction (defined as moving dirt, directing water, physically constructing something, or installing equipment)?

YES NO

- 1(a). If yes (structural), submit a feasibility report (to comply with Title 261, CH 2) including engineering and technical data and the following information:

This project will include a structural component (dam) at site WP-1. A preliminary design of this site was completed for the P-MRNRD in May 2018. The plans, technical specifications and accompanying geotechnical report are included as an attachment in the SIA (Olsson 2018d,e,a). Additionally, the original NRCS Plan and current Plan update is included in the SIA.

A discussion of the plan of development (004.01 A);

Site WP-1 was identified in the Papillion Creek Watershed Management (PCWM) Plan (HDR 2009) to provide regional detention of storm water during flood events and water quality improvements in the watershed. The Plan was developed to address a long history of flooding within the watershed, which extends from the upper reaches in Washington County, across Douglas County, and ending in Sarpy County at the confluence with the Missouri River. The Plan includes 14 storm water detention basins and associated water quality basins, as well as an implementation prioritization based on flood risk reduction and pressure of impending development. The West Papillion Creek Watershed, where site WP-1 is located, is the most rapidly developing watershed in the metropolitan area and in Nebraska, and this site was selected at the time the Plan was developed to maximize flood control, given what open ground remains in the area. This site has risen to the top of the list of a re-prioritization study recently conducted by the P-MRNRD to implement the project along with impending development and the loss (and growing expense) of viable land left for flood control. WP-1 lies within Douglas County and the extraterritorial jurisdiction (ETJ) of Omaha.

A description of all field investigations made to substantiate the feasibility report (004.01 B);

On-site investigations at WP-1 were conducted by the owner and Olsson Associates to collect visual observations and gain an understanding of the

proposed dam locations. A coordination meeting with NDNR Dam Safety personnel was held to discuss all safety-related aspects of the dam design, including auxiliary spillway design related to the existing and proposed adjacent roadways, and project hydrology. A detailed topographic and legal boundaries survey was completed for final design. A wetland delineation was completed to identify the location of jurisdictional water bodies located on the project site. This information will be used to determine project impacts and develop design alternatives and/or modifications to reduce potential impacts. A stream assessment was also completed for the site to document current and future channel conditions potentially impacted by the project. The findings from the assessments are documented in the following reports: Report of Geotechnical Exploration, WP-1 Dam, Omaha, Nebraska (Olsson 2018a), Wetland Delineation Report, Regional Detention Site WP-1, (Olsson 2018b), Riparian Reach Maps, Regional Detention Site WP-1, (Olsson 2018c), Cultural Resources Site Search (Parks 2018). All four investigative deliverables can be found in the SIA.

Maps, drawings, charts, tables, etc., used as a basis for the feasibility report (004.01 C);

Location maps have been inserted into the SIA as Figure B-1(a).4.1 and Figure B-1(a).4.2. There are numerous maps, charts, tables, etc. that help to define the project, show design intent and label site features. They are included throughout this application, in the SIA, and within the documents listed in the Bibliography.

A description of any necessary water and land rights and pertinent water supply and water quality information, if appropriate (004.01 D);

As per State statute, a Permit to Impound Water application will be submitted to NDNR upon completion of the final design of the WP-1 structure. 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 dam. Land Rights will be required for the construction, operation and maintenance of this site. The P-MRNRD intends to obtain the land rights fee-title and does not anticipate any resistance, as the site has 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.

A discussion of each component of the final plan including, when applicable (004.01 E);

Required geologic investigation (004.01 E 1);

Data collected for the sub-surface investigation described above was analyzed and used to perform a complete geotechnical analysis required for the dam design. A series of models were developed to assess settlement/stability and determine the specific embankment/foundation design requirements, design the downstream seepage berm, identify viable borrow site locations, and to develop a construction instrumentation and monitoring plan. This completed analysis is included in the geotechnical report included in the SIA (Olsson 2018a)

Required hydrologic data (004.01 E 2);

A hydrologic analysis of the contributing area to site WP-1 was completed during the preliminary design TM (Olsson 2018e). The table below summarizes the design storms that were modeled and are used to hydraulically size the site in accordance with NDNR dam design criteria.

	WP1
Permanent Pool	1178.0
100-yr	1186.4
500-yr	1189.2
PMP	1193.8 ²

Future land use was applied to the hydrologic models (assumed fully developed conditions) in order to produce the most conservative results.

Design criteria for final design including, but not limited to, soil mechanics, hydraulic, hydrologic, structural, embankments and foundation criteria (004.01 E 3).

As reported in the Technical Memorandum (TM) prepared during preliminary design (Olsson 2018e), different precipitation models were used for the design storms. For the hydraulic analysis during preliminary design, the most conservative result from the different precipitation models was applied to set the auxiliary spillway and top of dam elevations. This will be revisited during final design and final hydrology will be set in coordination with NDNR Dam Safety. The dam design will adhere, as a minimum, to the requirements in the NRCS TR-60 Earth Dam and Reservoirs guidance (NRCS 2005). The permanent pool elevations were selected as a function of a reservoir sustainability analysis and are described in detail in the TM (Olsson 2018e). A water quality basin is proposed on the upstream end of the reservoir to capture and store nutrients and sediments delivered to the site. Efforts were made to size the basin to trap the anticipated heavy sediment load transported during the development of the watershed.

- 1(b). If no (non-structural), submit data necessary to establish technical feasibility including, but not limited to the following (004.02):

A discussion of the plan of development (004.02 A);

A description of field or research investigations utilized to substantiate the project conception (004.02 B);

A description of the necessary water and/or land rights, if applicable (004.02 C);

A discussion of 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).

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 the Papillion Creek Watershed Partnership (PCWP). The PCWM Plan (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, 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 site WP-1 as favorable in this watershed. This project will provide flood control benefits specifically on the West Branch of the Papillion Creek. As a result of watershed development to date, the West Papillion Creek levee system no longer contains the 100-yr flood and required freeboard in accordance with FEMA criteria. The P-MRNRD performed two studies, the West Papillion Creek Levee Restoration – Summary of Previous Analyses (HDR 2006) and the West Papillion Creek Levee Restoration Evaluation (HDR 2008), to assess flood control measures to restore the required levee freeboard. Like the PCWM Plan, these studies also studied various alternatives to reduce flooding in the watershed and the net result of both plans is that this site is vital to providing flood control in the overall watershed and this sub-watershed. This site represents the maximum drainage area that can be controlled in the watershed, given the current development and infrastructure in the area. A detailed description of the alternatives studies is in the studies referenced in the SIA Bibliography.

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 shall be fifty (50) years or with prior approval of the Director, up to one hundred (100) years [T261 CH 2 (005)].
- 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). [Click here to enter text.](#)
 - 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 any intangible or secondary benefits 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, such that the economic feasibility of the project can be approved by the Director and the Commission (005.02). [Click here to enter text.](#)
 - All benefit and cost data shall be presented in a table form to indicate the annual cash flow for the life of the proposal, not to exceed 100 years (005.03). [Click here to enter text.](#)
 - 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, the economic feasibility of such proposal shall be demonstrated by such method as the Director and the Commission deem appropriate (005.04). [Click here to enter text.](#)

Costs

A summary of all initial capital costs related to the project area presented in the table below, and a more detailed breakdown of the land purchase and construction costs are provided in the SIA. They include all the items listed in the top bullet above. Detailed cost estimates for construction items and land rights are included in the SIA Tables B-3.1 through B-3.3.

Summary of Costs	WP-1
Professional Services	\$1,737,214
Land Purchase	\$5,263,000
Construction	\$6,922,001
Total	\$13,922,215

Benefits

The costs are weighed against the primary tangible benefits as described in the *Title 264 – Rules Governing the Administration of the Water Sustainability Fund* (NDNR 2015a). For this project, those benefits include flood reduction benefits, recreation benefits, and land improvement values. A detailed discussion of the quantified benefits and the computation tables are located in SIA Tables B-3.4 through B-3.7 with supporting Figure B-3.2. Additional justification for flood damage reduction values is contained in the WP 6&7 2016 WSF Application (FYRA 2016) included in the bibliography as the methodology for the valuation of the benefits is contained within that document. Flood damage reduction benefits for Site WP-1 were indexed from that information as shown below with WP-1 possessing just short of half of the drainage acres controlled as Sites WP-6&7 together. The calculated benefits were then indexed from 2016 to 2018 values.

Benefit:Cost

The benefit:cost ratio computed from the total annual costs and benefits reported above for the project is 1.82 for the 100-year project life.

The period of analysis shown for this project is 100 years. Three primary factors were considered regarding project life of the project and therefore, its ability to provide project benefits:

1. The reservoir volume was designed to trap incoming sediments as efficiently as possible. This means maximizing the pool volume, given the land rights available at the site. Additionally, a water quality basin is designed at the site to provide additional trapping capability at the headwater of the reservoir. A lengthy discussion of the reservoir's sustainability is contained in the *WP-1 TM* (Olsson 2018e), but in summary, the reservoir is anticipated to last in excess of 200 years, given the sediment loading anticipated for the site.
2. The materials used in the dam design are of the highest quality. The principal spillway is a lined steel cylinder concrete pressure pipe. All other non-native materials are reinforced concrete designed to convey a probable maximum flood (PMF), and therefore have extremely conservative design requirements. Dams designed 100 years ago were not designed anywhere near this level of conservatism are still around today and functioning as intended.
3. NDNR Dam Safety Requirements require that dams be designed to high hazard potential criteria within metropolitan areas. This requires that the dam safely passes a PMF event and that all engineering design of the embankment uses factors of safety in the design that are highly conservative. Very few engineered projects anywhere use such a

conservative design. This, and the closely monitored maintenance inspections conducted through the life of the project required by State law, contributes to the above factors in ensuring that this project will function as intended into the future for years to come.

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

The P-MRNRD has planned for and budgeted the cost of the design and majority of the land rights acquisition for this site in their current budget, as reported in their P-MRNRD FY 2019 Tax Levy and Adoption Budget Memorandum (P-MRNRD 2018a). They have a proven record of planning their budgets on an annual basis to account for the costs required for their upcoming projects. The P-MRNRD also increased their tax levy two years ago in anticipation, in part, of purchasing land rights for this site and others being pressured by development.

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

The P-MRNRD includes maintenance costs in their annual budget every year for the maintenance of the dams that they operate. The budgeted amount is reviewed in detail every year by assessing annual maintenance costs and any special project needs. A budget statement from the NRD on funds available for this project is provided in the SIA (PMRNRD 2018a). For fiscal years after the construction of site WP-1, the operating budget levy will be adjusted to increase funding available for maintenance items.

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

N/A

7. Describe how the plan of development minimizes impacts on the natural environment.

Numerous design alternatives were screened in the PCWM Plan (HDR 2009), but were refined in the Section 404 permitting process to avoid and minimize environmental impacts. The permitting process is underway and ongoing and the impacts are considered relatively small. Stream assessments of waterways within the project area were also conducted according to the methodologies and procedures outlined in the U.S. Army Corps of Engineers Nebraska Stream Condition Assessment Procedure

(NeSCAP). The procedure involved the review of available published resources combined with field assessments to evaluate the physical and biological attributes of a stream reach. The studies found that stream channel reaches degrade moving downstream as they become deeply incised, disconnected from the floodplain, heavily eroded streambanks and appear to be frequently disturbed (Olsson 2018b,c). The same assessment methodology was applied to future (post project) conditions to determine stream health and function impacts related to the project. This analysis found that the project will increase stream function within the project area. Specifically, there will be an overall increase in habitat stability, improvements to riparian buffer communities and decreases in erosion will increase aquatic functions. The reservoir will create both deep and shallow open water habitat, inundated wetlands, and emergent wetland/mesic tallgrass prairie transition zones. Tree and shrub dominated areas may also develop with the buffer zone by natural colonization, or promoted with plantings in designated areas.

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

The P-MRNRD 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. This flood control site directly aligns with the types of projects that 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.

In the NDNR's Annual Report and Plan of Work for the Nebraska State Water Planning and Review Process (hereafter referred to as the Annual Report) (NDNR 2017a), the Statewide activities describe Water Sustainability Fund goals. This project fits multiple goals stated in the document:

- Contribute to multiple water supply management goals including flood control, reducing threats to property damage, agricultural uses, municipal and industrial uses, recreational benefits, wildlife habitat, conservation and preservation of water resources. The benefits of this project and how it achieves these goals are described in detail below:

Flood Control: The primary purpose of this dam site is flood control and water quality improvements as identified in the PCWM Plan (HDR 2009). The reservoir will attenuate flood flows through a 48”

diameter principal spillway pipe, storing flood flows in the reservoir. They are designed to maximize flood reduction benefits in a rapidly developing watershed. The dam 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 the City of Papillion and Bellevue from the 100-yr flood event. Without the reservoirs identified in the PCWM Plan (HDR 2009), costly levee modifications and bridge raises would be required to bring the West Branch levees into FEMA compliance.

Recreation: The proposed project components provide numerous recreational, wildlife habitat, water resource conservation and preservation benefits (Olsson 2018e). Reservoirs create multiple recreational opportunities near Nebraska's largest population base including fishing, boating, canoeing, wildlife viewing, hiking and picnicking. While all existing flood control reservoir day use facilities provide a diversity of public use amenities, it is appropriate for WP-1 to provide like uses the public is accustomed to with a P-MRNRD installation. Primary programmed uses for WP-1 focus upon hiking/bicycling trail use, picnicking, shoreline fishing, and boat ramp water access. The following is a summary of proposed day use facilities for WP-1:

- Paved access to stabilized shoreline landing/launch area.
- One universally accessible floating kayak and canoe launch.
- One day use picnic shelter with associated table and grill provisions – fully accessible.
- Waterless accessible toilet facility with single male and female stalls.
- 1.6 mile concrete multi-use trail – single loop circumnavigating reservoir.
- Seven stabilized shore fishing extensions into the lake (6 aggregate paved and 1 ADA compliant surface). Fishing extensions allowing shore anglers to gain better access to deeper waters.
- Concrete parking area.
- Open park space for sledding and exploration

Water Quality: The water quality and aquatic habitat benefits from this project are substantial. Water quality basins upstream of the reservoir can have a major impact on reservoir sustainability. The primary function of a water quality basin is to trap sediment upstream of the reservoir and prevent transport of this material into the main body. This concentrates the material into a smaller, more manageable location and prevents reduction of the water volume in the reservoir, which is beneficial to maintaining water quality and planned lake depths. Pollutant load reductions can be expected,

specifically 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 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. A few additions are incorporated into the basin design to improve the basin's function. The configuration of the riser structure will increase the drawdown time for smaller events that often have the greatest impact on water quality (generally the first 0.5 inches of runoff). In summary, additional earthwork grading that increases storage capacity, the creation of wetlands and increasing the surface area will collectively improve the basin's performance.

Wildlife Habitat: The reservoir will create diverse deep and shallow water habitats for a variety of aquatic organisms and birds. The reservoir also impacts water quality in a positive way by further reducing 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 reservoir causes 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 to water quality and loss of aquatic life and habitat through a variety of geomorphic mechanisms. These mechanisms include less 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.

10. Are land rights necessary to complete your project?

YES NO

If yes, provide a complete listing of all lands involved in the project.

Site WP-1 will encompass an estimated 105.3 acres. See Section B-3 of the SIA for maps associated with the table below. The P-MRNRD does not currently own all of this ground, but have already initiated communication with the land owners regarding the land acquisition process. All landowners are aware of the project and at this time, are anticipated to be willing sellers

to this project and the planned developments surrounding the project.

Parcel	Area*	Unit	Unit Cost	Cost
117690004	35.37	AC	\$50,000.00	\$1,768,500
117700000	18.06	AC	\$50,000.00	\$903,000
117710004	13.85	AC	\$50,000.00	\$692,500
117750006	16.35	AC	\$50,000.00	\$817,500
117750008	5.61	AC	\$50,000.00	\$280,500
117760010	2.31	AC	\$50,000.00	\$115,500
123620000	7.52	AC	\$50,000.00	\$376,000
123620003	4.19	AC	\$50,000.00	\$209,500
123630002	0.04	AC	\$50,000.00	\$2,000
123630004	1.96	AC	\$50,000.00	\$98,000
TOTAL	105.26			\$5,263,000

If yes, attach proof of ownership for each easements, rights-of-way and fee title currently held.

The NRD has purchased two of the properties and is not seeking reimbursement for this project cost. Copies of the two purchase agreements are included in the SIA (PMRNRD 2018b,c)

If yes, provide assurance that you can hold or can acquire title to all lands not currently held.

The P-MRNRD is currently undergoing negotiations with multiple land owners for acquisition. All land owners are anticipating the sale and to date have not indicated unwillingness to sell. The P-MRNRD 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.

This project falls directly in line with the roles and responsibilities of the P-MRNRD. The P-MRNRD will obtain all necessary permits and land rights to complete the project to obtain the authority needed to perform work on their own property.

12. Identify the probable environmental and ecological consequences that may result as the result of the project.

The water quality and aquatic habitat benefits from this project are substantial. Water quality basins upstream of the reservoir can have a

major impact on reservoir sustainability. The primary function of a water quality basin is to trap sediment upstream of the reservoir and prevent transport of this material into the main body. This concentrates the material into a smaller, more manageable locations 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 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.

A few additions are incorporated into the basin design to improve the basin's function. The configuration of the riser structure will increase the drawdown time for smaller events that often have the greatest impact on water quality (generally the first 0.5 inches of runoff). In summary, additional earthwork grading that increases storage capacity, the creation of wetlands and increasing the surface area will collectively improve the basin's performance.

The reservoir will create diverse deep and shallow water habitats for a variety of aquatic organisms and birds. The reservoir also impacts water quality in a positive way by further reducing 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 reservoir causes 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 to water quality and loss of aquatic life and habitat through a variety of geomorphic mechanisms. These mechanisms include less 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. Numerous design alternatives were screened in the PCWM Plan (HDR 2009), but were refined in the Section 404 permitting process to avoid and minimize environmental impacts. The permitting process is well underway and ongoing. Although the impacts are considered relatively small, the project will require Section 404 permits and will result in some unavoidable impacts that are documented in (Olsson 2015b). A summary of these impacts includes:

- Construction of the WP-1 dam and spillway would require fill in an estimated 0.37 acres of PEMA/PEMC wetlands and 543 linear ft of channel.
- An estimated 0.43 acres of PEMA/PEMC wetlands and 2,556 linear feet of channel would be inundated within the permanent pool.

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

Section C.

NRC SCORING

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

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

Notes:

- The responses to one criterion *will not* be considered in the scoring of other criteria. Repeat references as needed to support documentation in each criterion as appropriate. The 15 categories are specified by statute and will be used to create scoring matrixes which will ultimately determine which projects receive funding.
- There is a total of 69 possible points, plus two bonus points. The potential number of points awarded for each criteria are noted in parenthesis. 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 that contains 780,704 people in the watershed (over 40% of Nebraska's population), this reservoir 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 and those communities that have taking water from the Missouri River planned in their future.

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.

The P-MRNRD and Nebraska Department of Natural Resources (NDNR) jointly adopted a voluntary Integrated Management Plan (IMP) in August of 2014. Actions to meet the goals and objectives of this IMP are underway. Goal 1 is to develop and implement water use policies and practices which better protect existing surface and groundwater uses while allowing for future development. The P-MRNRD and NDNR have adopted rules and regulations restricting the amount of groundwater and surface water development each year and the P-MRNRD has updated their Groundwater Management Plan (circa March 1994) and adopted changes in February 2018 to be more consistent with the IMP. Much like Groundwater Management Plans can have direct ties to IMP goals and objectives, Watershed Management Plans can be considered existing policies and authorities used to address water quality and quantity issues of an IMP. The project proposed under this application is part of the PCWM Plan (HDR 2009) and helps achieve Goal 1, Objective 1.1 of the P-MRNRD IMP. Regional Detention Structures along with other components of the PCWM Plan (HDR 2009) strive to maintain or restore natural watershed hydrology and reduce peak discharge. The effects of this regional detention and stormwater management system not only help curb flooding, but help restore more natural base flows to receiving streams or rivers by increasing groundwater infiltration and subsequent seepage, store and slowly release surface water runoff, and remove some pollutants and contaminants not naturally found in the surface or ground water.

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.

The P-MRNRD and NDNR jointly adopted a voluntary IMP in August of 2014. Actions to meet the goals and objectives of this IMP are underway. Goal 1 is to develop and implement water use policies and practices which better protect existing surface and groundwater uses while allowing for future development. The P-MRNRD and NDNR have adopted rules and regulations restricting the amount of groundwater and surface water development each year and the P-MRNRD has updated their Groundwater Management Plan (circa March 1994) and adopted changes in February 2018 to be more consistent with the IMP. Much like Groundwater Management Plans can have direct ties to IMP goals and objectives, Watershed Management Plans can be considered existing policies and authorities used to address water quantity issues of an IMP. The project proposed under this application is part of the PCWM Plan (HDR 2009) and does help achieve Goal 1, Objective 1.1 of the P-MRNRD IMP. The Papillion Creek Aquifer is located at varying depths throughout the watershed. In the vicinity of site WP-1 the aquifer is at a depth of 40 to 120 feet. This dam will provide recharge for any draws on the aquifer. A low-level drawdown conduit will be installed on the reservoir's riser as well, as required by NDNR Dam Safety Regulations. These drawdowns can be operated to provide increased streamflow downstream for any senior water rights or future demands on the stream. The above points address recharge, aquifer depletion and streamflow enhancement, but with regards to contributing to sustainability goals, "Water Sustainability" is defined in Nebraska Title 264 as when water use is sustainable when current use promotes healthy watersheds, improves water quality, and protects the ability of future generations to meet their needs. Recognizably, sustainability has varied meanings across the State. In Eastern Nebraska, watershed health is related to reducing the threat of flood damage first and foremost. Nearly every watershed plan in this region addresses flood control first. And as argued above, finding any project that would protect the ability of future generations to meet their needs would be difficult, given the protection this project provides to one of Nebraska's thriving communities and contributor to the State's economy. Regional Detention Structures along with other components of the PCWM Plan (HDR 2009) strive to maintain or restore natural watershed hydrology and reduce peak discharge. The effects of this regional detention and stormwater management system not only help curb flooding, but help restore more natural base flows to receiving streams or rivers by increasing groundwater infiltration and subsequent seepage, store and slowly release surface water runoff, and remove some pollutants and contaminants not naturally found in the surface or ground water.

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: The primary purpose of this dam site is flood control and water quality improvements as identified in the PCWM Plan (HDR 2009). The reservoir will attenuate flood flows through a 48” diameter principal spillway pipe, storing flood flows in the reservoir. They are designed to maximize flood reduction benefits in a rapidly developing watershed. The dam 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 the City of Papillion and Bellevue from the 100-yr flood event. Without the reservoirs identified in the PCWM Plan (HDR 2009), costly levee modifications and bridge raises would be required to bring the West Branch levees into FEMA compliance.

Recreation: The proposed project components provide numerous recreational, wildlife habitat, water resource conservation and preservation benefits (Olsson, 2018e). Reservoirs create multiple recreational opportunities near Nebraska’s largest population base including fishing, boating, canoeing, wildlife viewing, hiking and picnicking. While all existing flood control reservoir day use facilities provide a diversity of public use amenities, it is appropriate for WP-1 to provide like uses the public is accustomed to with a P-MRNRD installation. Primary programmed uses for WP-1 focus upon hiking/bicycling trail use, picnicking, shoreline fishing, and boat ramp water access. The following is a summary of proposed day use facilities for WP-1:

- Paved access to stabilized shoreline landing/launch area.
- One universally accessible floating kayak and canoe launch.
- One day use picnic shelter with associated table and grill provisions – fully accessible.
- Waterless accessible toilet facility with single male and female stalls.
- 1.6 mile concrete multi-use trail – single loop circumnavigating reservoir.
- Seven stabilized shore fishing extensions into the lake (6 aggregate paved and 1 ADA compliant surface). Fishing extensions allowing shore anglers to gain better access to deeper waters.
- Concrete parking area.
- Open park space for sledding and exploration

Water Quality: The water quality and aquatic habitat benefits from this project are substantial. Water quality basins upstream of the reservoir can have a major impact on reservoir sustainability. The primary function of a water quality basin is to trap sediment upstream of the reservoir and prevent transport of this material into the main body. This concentrates the material into a smaller, more manageable location and prevents reduction of the water volume in the reservoir, which is beneficial to maintaining water quality and planned lake depths. Pollutant load reductions can be expected, specifically 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 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. A few additions are incorporated into the basin design to improve the basin's function. The configuration of the riser structure will increase the drawdown time for smaller events that often have the greatest impact on water quality (generally the first 0.5 inches of runoff). In summary, additional earthwork grading that increases storage capacity, the creation of wetlands and increasing the surface area will collectively improve the basin's performance.

Wildlife Habitat: The reservoir will create diverse deep and shallow water habitats for a variety of aquatic organisms and birds. The reservoir also impacts water quality in a positive way by further reducing 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 reservoir causes 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 to water quality and loss of aquatic life and habitat through a variety of geomorphic mechanisms. These mechanisms include less 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.

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.

In highly urbanized areas, flood control remains the top focus of Nebraskans within the urban area. This project addresses that need directly as part of a well-developed plan. While providing flood control benefits, this project offers secondary beneficial uses to Nebraskans including recreation and additional health and wellness opportunities, habitat improvement, water quality improvements and opportunities for education regarding all of the above. There will be no reduced beneficial uses. Impacts to existing resources are detailed throughout the environmental permitting process and mitigation measures are planned to more than offset the impacts. This project provides a beneficial impact by reducing the threat of flooding and enhancing the opportunity for Nebraskans to enjoy the water resources of the State in a highly urbanized area.

6. Is cost-effective;

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

A cost summary table detailing all of the costs for the proposed project is provided in a summary table in SIA Section A-1. All detailed costs are shown in the SIA Section B-3 along with the benefits, cash flow stream and economic comparison. The comparison shows the cost effectiveness of the plan with an overall B:C ratio of 1.82:1.

Site WP-1 was identified in the PCWM Plan (HDR 2009) to provide regional detention of storm water during flood events and water quality improvements in the watershed. This was developed to address a long history of flooding within the watershed, which extends from the upper reaches in Washington County, across Douglas County, and ending in Sarpy County at the confluence with the Missouri River. The PCWM Plan (HDR 2009) includes 14 storm water detention basins and associated water quality basins, as well as an implementation prioritization based on flood risk reduction and pressure of impending development. The report provides detailed information on the alternatives studies and their costs.

Flood reduction in the Papillion Creek watershed has been studied extensively through efforts undertaken by the PCWP. The PCWM Plan (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, it was concluded that the regional detention

structures are still required to reduce flood flows and prevent associated damage.

This project will provide flood control benefits specifically on the West Branch of the Papillion Creek. As a result of watershed development currently, the West Papillion Creek levee system no longer contains the 100-yr flood and required freeboard in accordance with FEMA criteria. The P-MRNRD performed two studies, the West Papillion Creek Levee Restoration – Summary of Previous Analyses (HDR 2006) and the West Papillion Creek Levee Restoration Evaluation (HDR 2008), to assess flood control measures to restore the required levee freeboard. Like the PCWM Plan, these studies also studied various alternatives to reduce flooding in the watershed and the net result of both plans is that WP-1 is vital to providing flood control in the overall watershed and this sub-watershed. This site represents the maximum drainage area that can be controlled in the watershed, given the current development and infrastructure in the area. A detailed description of the alternatives studies is in the SIA Bibliography.

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 is required to maintain the integrity of the Nation's waters, and requires states to establish a list of impaired that do not meet water quality standards. Once on the 303(d) of impaired waters, it is required that a Total Maximum Daily Load (TMDL) report is developed to set goals and pollutant load reductions required for the water body to meet water quality standards. The entire Papillion Creek system, which includes the Little Papillion Creek, Cole Creek, Big Papillion Creek, West Papillion Creek tributaries, is on the 303(d) list of impaired waters for *E.coli* and the TMDL for the Papillion Creek Watershed Report (hereafter referred to as the TMDL Report) (NDEQ 2009) was developed.

The water quality benefits improvements from this project will help contribute to reductions in the *E.coli* load, specifically to the West Papillion Creek immediately downstream of the site. This is achieved by increasing the surface area exposed to sunlight and extending the detention time of the water, allow for additional bacteria die off prior to discharging 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 reduces (nearly eliminates) the threat to the lands between the dam and the West Branch Papillion Creek. That land is shown in the SIA Section B-3 and includes the existing facilities labeled on the figure that will be protected by this project, in addition to future development for projects to come (some already in the planning stage). The project contributes much needed flood reduction within the West Branch and downstream Papillion Creek system and the transportation corridors, utilities and other infrastructure that runs along or through the Papillion Creek system. Flood reduction benefits are shown in aerial and tabular formats in the SIA Section B-3. Flood damage reductions are computed in the economic analysis, so the reduction in threats to critical infrastructure including roadways, etc. are detailed there. The project also provides a significant flood reduction threat to utilities along the Papillion Creek system, although quantifying that threat is technically difficult to impossible. The elimination of the threat is the benefit provided to Nebraskans.

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 water quality benefits from this project are substantial. Water quality basins upstream of the reservoir can have a major impact on reservoir sustainability. The primary function of a water quality basin is to trap sediment upstream of the reservoir and prevent transport of this material into the main body. This concentrates the material into a smaller, more manageable location and prevents reduction of the water volume in the

reservoir, which is beneficial to maintaining water quality and planned lake depths. Pollutant load reductions can be expected, specifically 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 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.

A few additions are incorporated into the basin design to improve the basin's function. The configuration of the riser structure will increase the drawdown time for smaller events that often have the greatest impact on water quality (generally the first 0.5 inches of runoff). In summary, additional earthwork grading that increases storage capacity, the creation of wetlands and increasing the surface area will collectively improve the basin's performance.

In addition, downstream water quality 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 reservoir causes a decrease in stormwater runoff flow rate, volume and velocity, which decreases erosion, sediment deposition and pollutant loading. Altering the magnitude, frequency and duration of stormwater runoff and sediment loads to streams reduces impacts to water quality and loss of aquatic life and habitat through a variety of geomorphic mechanisms. These mechanisms include less 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.

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 City of Omaha has been an avid supporter of this project and have participated in the planning efforts for WP-1 as the local governing jurisdictions. They have been an active participant in the planning process of WP-1 to date and are significant contributors to costs through the Papillion Creek Watershed Partnership. That support is shown in the letter of support in Section D-3 of the SIA. Douglas County has provided support

by participating as a key stakeholder through the preliminary design. All anticipated funding sources for the project are shown in the cost summary in the SIA Table A-1.1. The P-MRNRD currently taxes at a levy rate of \$0.037797 per \$100 of valuation to obtain a property tax income of nearly \$24.3 million. Because the P-MRNRD is not in a fully or over-appropriated basin, any remaining tax levy up to a \$0.045 levy rate will be required to pay the local share of the costs for this project and others that are currently being planned or designed. Because the P-MRNRD taxing authority will be completely utilized without being able to implement the projects vital to the P-MRNRD's mission, there has been new legislation introduced to generate additional tax dollars through the ability to finance capital improvement projects with a new bonding authority. The other funding sources are; The Natural Resources Conservation Service through the Regional Conservation Partnership Program (RCPP – see draft agreement NRCS 2017a,b), Environmental Protection Agency Section 319 funding (application in fall, 2018), Nebraska Game and Parks Commission (coordination on-going, application in fall, 2018).

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.

“Water Sustainability” is defined in Nebraska Title 264 as when water use is sustainable when current use promotes healthy watersheds, improves water quality, and protects the ability of future generations to meet their needs. Recognizably, sustainability has varied meanings across the State, in Eastern Nebraska, watershed health is related to reducing the threat of flood damage first and foremost. Nearly every watershed plan in this region addresses flood control first. And as argued above, finding any project that would protect the ability of future generations to meet their needs would be difficult, given the protection this project provides to one of Nebraska's thriving communities and contributor to the State economy. The primary sustainable practices for this project are flood control, water quality improvements, managing floodplain regulations and habitat improvement which all contribute to healthy watersheds. No other place in the State is the value of land and improvements as high, on average in this watershed due to the rate of development (also the highest in the State) occurring

around these reservoirs. Not only are those that are protected downstream of these sites benefitting from the projects, but all Nebraskans due as the area continues to grow, sustainably, and help fuel Nebraska's economy. The local jurisdiction that manages and enforces these practices are the individual municipalities that participate within the Papillion Creek Watershed Partnership. The City of Omaha and of course the Papio-Missouri River NRD are all among the participants in the Partnership. The P-MRNRD and Nebraska Department of Natural Resources (NDNR) jointly adopted a voluntary Integrated Management Plan (IMP) in August of 2014. Actions to meet the goals and objectives of this IMP are underway. Goal 1 is to develop and implement water use policies and practices which better protect existing surface and groundwater uses while allowing for future development. The P-MRNRD and NDNR have adopted rules and regulations restricting the amount of groundwater and surface water development each year and the P-MRNRD has updated their Groundwater Management Plan (circa March 1994) and adopted changes in February 2018 to be more consistent with the IMP. Much like Groundwater Management Plans can have direct ties to IMP goals and objectives, Watershed Management Plans can be considered existing policies and authorities used to address water quantity issues of an IMP. The project proposed under this application is part of the PCWM Plan and does help achieve Goal 1, Objective 1.1 of the P-MRNRD IMP.

12. Addresses a statewide problem or issue;

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

Flooding is the number one threat to Nebraskans in highly urbanized area. The real threat of flooding in the Papillion Creek Watershed is well documented in the PCWM Plan (HDR 2009). This project will address that issue by providing flood control in the West Branch of Papillion Creek and downstream throughout the system. The total number of acres, structures, etc. protected is based on the prorated values listed in the WP-6&7 WSF application (FYRA 201) and identified in Section B-3 of the SIA. The benefits have also been quantified and are detailed in Section B-3 of the SIA.

The project would also provide a benefit to the state by increasing the recreation opportunities with the amenities that will be installed at the site, which can lure tourists and visitors that would increase economic 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 multiple funding partners identified for this project. From the Federal level, this project contributes to the state's ability to leverage state dollars with a Federal funding source. Site WP-1 has been approved to receive federal funds through the NRCS Regional Conservation Partnership Program in the amount of \$3,352,469 to assist with the planning, engineering, and construction costs (see SIA Bibliography – Draft RCPP Agreement, NRCS 2017a,b). A funding application is being coordinated from the U.S. Fish and Wildlife Service's Sportfish Restoration Fund for fish habitat construction and angler access. The fund is administered locally by the Nebraska Game and Parks Commission and coordination on the design of these enhancements had been on-going. Also on the Federal level, funds will be requested from the Environmental Protection Agency's 319 fund, administered locally by the Nebraska Department of Environmental Quality. This is for water quality improvements and namely the basin planned at the head of the reservoir. On the State level, this Water Sustainability Fund is the largest request, but additional requests may be made from the Nebraska Environmental Trust as well. On the local level, both Douglas County and the City of Omaha are assisting in the planning for transportation and utility infrastructure surrounding the project. The City of Omaha will be taking over the long-term maintenance of the park area (the NRD remains responsible for the dam), and therefore, they will assume future operation and maintenance costs. Lastly, private funds are being used in synergies identified with the grading of the project and surrounding developments and in the development of watershed management practices above the reservoir that will maintain a sustainable, high quality lake. These partnerships at all levels saves the NRD money that will go towards additional structures that provide a safe watershed to Nebraskans. An updated cost-share schedule is provided in SIA Table A-1.1.

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.

A stream assessment of waterways within the project area was conducted according to the methodologies and procedures outlined in the U.S. Army Corps of Engineers Nebraska Stream Condition Assessment Procedure (NeSCAP). The procedure involved the review of available published resources combined with field assessments to evaluate the physical and biological attributes of a stream reach. The study found that stream channel reaches degrade moving downstream as they become deeply incised, disconnected from the floodplain, heavily eroded streambanks and appear to be frequently disturbed (Olsson 2018b,c,f). The same assessment methodology was applied to future (post project) conditions to determine stream health and function impacts related to the project. This analysis found that the project will increase stream function within the project area. Specifically, there will be an overall increase in habitat stability, improvements to riparian buffer communities and decreases in erosion will increase aquatic functions. The reservoir will create both deep and shallow open water habitat, inundated wetlands, and emergent wetland/mesic tallgrass prairie transition zones. Tree and shrub dominated areas may also develop with the buffer zone by natural colonization, or promoted with plantings in designated areas.

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 2017 Annual Report (NDNR 2017a), lists the objectives as related to the Water Sustainability Fund;

- Provide financial assistance to programs, projects, or activities that increase aquifer recharge, reduce aquifer depletion, and increase streamflow;
- Remediate or mitigate threats to drinking water;
- Promote the goals and objectives of approved integrated management plans or ground water management plans;
- Contribute to multiple water supply management goals including flood control, reducing threats to property damage, agricultural uses, municipal and industrial uses, recreational benefits, wildlife habitat, conservation, and preservation of water resources;
- Assist municipalities with the cost of constructing, upgrading, developing, and replacing sewer infrastructure facilities as part of a combined sewer overflow project;
- Provide increased water productivity and enhance water quality;
- Use the most cost-effective solutions available; and
- Comply with interstate compacts, decrees, other state contracts and agreements and federal law.

The objectives of the fourth, sixth and seventh goals are met as follows;

Flood Control: The primary purpose of this dam site is flood control and water quality improvements as identified in the PCWM Plan (HDR 2009). The reservoir will attenuate flood flows through a 48” diameter principal spillway pipe, storing flood flows in the reservoir. They are designed to maximize flood reduction benefits in a rapidly developing watershed. The dam 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 the City of Papillion and Bellevue from the 100-yr flood event. Without the reservoirs identified in the PCWM Plan (HDR 2009), costly levee modifications and bridge raises would be required to bring the West Branch levees into FEMA compliance.

Recreation: The proposed project components provide numerous recreational, wildlife habitat, water resource conservation and preservation benefits (Olsson 2018e). Reservoirs create multiple recreational opportunities near Nebraska’s largest population base including fishing, boating, canoeing, wildlife viewing, hiking and picnicking. While all existing flood control reservoir day use facilities provide a diversity of public use amenities, it is appropriate for WP-1 to provide like uses the public is accustomed to with a P-MRNRD installation. Primary programmed uses for WP-1 focus upon hiking/bicycling trail use, picnicking, shoreline fishing, and boat ramp water access. The following is a summary of proposed day use facilities for WP-1:

- Paved access to stabilized shoreline landing/launch area.
- One universally accessible floating kayak and canoe launch.
- One day use picnic shelter with associated table and grill provisions – fully accessible.

- Waterless accessible toilet facility with single male and female stalls.
- 1.6 mile concrete multi-use trail – single loop circumnavigating reservoir.
- Seven stabilized shore fishing extensions into the lake (6 aggregate paved and 1 ADA compliant surface). Fishing extensions allowing shore anglers to gain better access to deeper waters.
- Concrete parking area.
- Open park space for sledding and exploration

Water Quality: The water quality and aquatic habitat benefits from this project are substantial. Water quality basins upstream of the reservoir can have a major impact on reservoir sustainability. The primary function of a water quality basin is to trap sediment upstream of the reservoir and prevent transport of this material into the main body. This concentrates the material into a smaller, more manageable location and prevents reduction of the water volume in the reservoir, which is beneficial to maintaining water quality and planned lake depths. Pollutant load reductions can be expected, specifically 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 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. A few additions are incorporated into the basin design to improve the basin's function. The configuration of the riser structure will increase the drawdown time for smaller events that often have the greatest impact on water quality (generally the first 0.5 inches of runoff). In summary, additional earthwork grading that increases storage capacity, the creation of wetlands and increasing the surface area will collectively improve the basin's performance.

Wildlife Habitat: The reservoir will create diverse deep and shallow water habitats for a variety of aquatic organisms and birds. The reservoir also impacts water quality in a positive way by further reducing 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 reservoir causes 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 to water quality and loss of aquatic life and habitat through a variety of geomorphic mechanisms. These mechanisms include less 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 upstream of the reservoir and the reservoir itself will have a major impact on reservoir sustainability. The primary function of a water quality basin is to trap sediment upstream of the reservoir and prevent transport of this material into the main body. This concentrates the material into a smaller, more manageable location and prevents reduction of the water volume in the reservoir, which is beneficial to maintaining water quality and planned lake depths. Pollutant load reductions can be expected, specifically 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 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. A few additions are incorporated into the basin design to improve the basin's function. The configuration of the riser structure will increase the drawdown time for smaller events that often have the greatest impact on water quality (generally the first 0.5 inches of runoff). In summary, additional earthwork grading that increases storage capacity, the creation of wetlands and increasing the surface area will collectively improve the basin's performance. In addition, downstream water quality 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 reservoir causes a decrease in stormwater runoff flow rate, volume and velocity, which decreases erosion, sediment deposition and pollutant loading. Altering the magnitude, frequency and duration of stormwater runoff and sediment loads to streams reduces impacts to water quality and loss of aquatic life and habitat through a variety of geomorphic mechanisms. These mechanisms include less 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.

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.

The P-MRNRD maintains a responsibility with FEMA under their P-MRNRD Mapping Activity Statement (FEMA). Under this agreement, the P-MRNRD agrees, as a Cooperating Technical Partner (CTP) to provide FEMA with updated mapping information within the project area and other areas in the P-MRNRD's jurisdiction. In order to do so, FEMA guidelines on mapping and the map modernization process must be followed. This process requires levee certification for any levee systems that will continue to show protection from the 1% chance of occurrence ("100-year") flood. This must be done in accordance with CFR, Title Section 65.10 (Federal Government of the United States 2015a). This project is designed to minimize changes to the downstream floodplains that are mandated to be updated by FEMA. Additionally, this project contributes to mitigation plans that will minimize certification efforts that will be required on the West Branch levee system through Papillion. The P-MRNRD also has a responsibility to meet Total Maximum Daily Loads (TMDLs) in the Papillion Creek Watershed which are for bacteria in the streams. These reservoirs help to reduce bacteria from agricultural and even more so, urban, areas by increasing travel time for the water while in the reservoirs and allowing the bacteria to die off longer. "Water Sustainability" is defined in Nebraska Title 264 as when water use is sustainable when current use promotes healthy watersheds, improves water quality, and protects the ability of future generations to meet their needs. Recognizably, sustainability has varied meanings across the State, in Eastern Nebraska, watershed health is related to reducing the threat of flood damage first and foremost. Nearly every watershed plan in this region addresses flood control first. Finding any project that would protect the ability of future generations to meet their needs would be difficult, given the protection this project provides to one of Nebraska's thriving communities and contributor to the State economy. By protecting the population and providing so many benefits, this project is a perfect fit for furthering the goals of water sustainability.

Section D.

PROJECT DESCRIPTION

1. Overview

In 1,000 characters or less, provide a brief description of your project including the nature and purpose of the project and objectives of the project.

The P-MRNRD is proposing construction of a regional detention basin within the West Papillion Creek watershed that was identified in the PCWM Plan (HDR 2009). The report identified the best remaining options available for providing flood control and lake and stream water quality benefits within the 402 square-mile watershed. The plan was developed to address a long history of flooding within the watershed, which extends from the upper reaches in Washington County, across Douglas County, and ending in Sarpy County at the confluence with the Missouri River. The plan includes 14 storm water detention basins and associated water quality basins, as well as a prioritization based on flood risk reduction.

The WP-1 structure will provide regional detention in the West Papillion Creek sub-watershed, located in Douglas and Sarpy Counties, NE on the tributary shown on the location map in Section B-1(a) of the SIA. This is one of the most rapidly developing watersheds in the metropolitan area and this site was selected to maximize flood control, given what open ground remains in the area in a rapidly developing watershed area. This site is at the top of the list of the NRD's current prioritization list due to impending development and funding received from NRCS.

The primary purpose of the proposed dam structure is flood control, and several ecologic and recreation benefits are realized with the implementation of the reservoir. The earthen dam will have a primary spillway outlet pipe that controls the permanent pool elevation in the reservoir. The auxiliary spillway is set at the modeled 500-yr storm elevation, which will provide flood storage and reduced discharge for all events up to the 500-yr storm. The PCWM Plan (HDR 2009) sites will control 5,055 acres of drainage area and provide 2,386 acre-ft of flood storage. A breakdown of the site data for WP-1 is located in the SIA (Olsson 2018e).

According to the Papillion Creek HMS model created for FEMA floodplain remapping, the sites collectively reduce the 100-yr peak flood discharge on the West Papillion Creek by 9-13%, which reduces the elevation raise required to meet FEMA requirements on average by 0.6 ft.

The ecological benefits include large improvements to water quality. Not only is there a planned water quality basin upstream of the site to protect the reservoir, but the reservoir also protects and improves the water quality discharged downstream into the West Papillion Creek. The water quality basin will trap sediment and prevent accumulation in the main reservoir. Of the sediment that reaches the reservoir, the majority will settle in the large reservoir and will not be transported downstream. This plays a large role in the reduction of *E.coli* transported to the West Papillion Creek, since *E.coli* is attached to sediment particles. The reservoir and water quality basin will also extend the time it takes for water to transfer into the lake, providing additional die off time for bacteria. The increase in water surface area provided by the project also provides more ultraviolet light exposure that kills bacteria. Collectively the project should provide substantial reductions in *E.coli*, for which the West Papillion Creek is currently listed as impaired, and will be highly beneficial in helping meet the goals listed in the TMDL Report (NDEQ 2009). Additionally, nutrient load reductions will be achieved through settling from increased detention time, as well as biological uptake from the increased wetland area created by this project.

Aquatic and wildlife habitat improvements will all be experienced as part of this project. The stream assessment found that the stream channel reaches in the project area are degraded, are becoming deeply incised and are disconnected from the floodplain. They have heavily eroded streambanks and appear to be frequently disturbed. Future conditions provided by the dams will create grade stability and prevent continued erosion. The reservoir creates both deep and shallow water habitats and improvements to the riparian and buffer zones.

Recreation will also be improved with the activities associated with the reservoir, as well as park features that are included in the recreation plan. The open water provides fishing, boating and kayaking opportunities. Additionally, trails and angler access features, as well as boat ramps and picnic facilities increase the recreation opportunities in the urban area.

2. Project Tasks and Timeline

Identify what activities will be conducted by the project. For multiyear projects please list what activities are to be completed each year.

The tasks have been broken down into the following:

Professional Services: Includes all of the 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 a water quality basin included as part of the project. Also included are professional and legal

services required to facilitate land purchase and to perform construction observation.

Land Purchase: Includes performing appraisals and negotiations with land owners, and obtaining the property required for the project.

Construction: Includes construction of the dam and all associated features. Below is the timeline associated with these tasks.



3. Partnerships

Identify the roles and responsibilities of agencies and groups involved in the proposed project regardless of whether each is an additional funding source. List any other sources of funding that have been approached for project support and that have officially turned you down. Attach the rejection letter.

NRCS: NRCS is providing technical and financial assistance through their Regional Conservation Partnership Program (RCPP.) This assistance is geared towards the completion of the original Workplan for the watershed originally prepared by NRCS in the 1960s which is located in the SIA (NRCS 1960).

PCWP: This partnership has been involved from the beginning in identifying this project site as a need to reduce flood control. They have maintained their involvement with monthly meeting updates and monitoring to track the progress of projects in the watershed. Watershed Fees are collected via ordinance from development communities at the time of a building permit that help support the PCWP and ultimately the projects they support.

Nebraska Game and Parks Commission (NGPC): The NGPC regularly attends coordination meetings to provide input and help make decisions

regarding the project design, specifically related to the recreational opportunities. The NGPC is a funding source, as it uses its ability to apply for Federal Sport Fish Restoration Program grant funding and contribute obtained funds toward projects.

City of Omaha (City): The site is located within the City's ETJ that is intended for annexation. The City regularly attends coordination meetings to provide input and help make decisions regarding the design of the site. They are specifically involved in decisions that impact roadways and future development. The City will manage the recreational facilities located at the site upon completion of the project. The City is a funding partner related to long-term maintenance and operation of the site.

Douglas County (County): The County regularly attends coordination meetings to provide input and help make decisions regarding the design of the site within the County's current transportation infrastructure. Since they currently maintain the roadways around site WP-1 and the majority of the watershed drainage is currently located outside of the City boundary in the County. The County is not a funding partner.

4. 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 detailed out for the project during the economic analysis is provided in the following table. Federal funding has been acquired, and state grants are being applied for, and cost sharing from local project partners will go towards this project, which is summarized in the table in below and in Section A-1 of the SIA.

NRCS: NRCS is providing technical and financial assistance through their Regional Conservation Partnership Program (RCPP.) \$3,352,469 has been provided for funding assistance for the planning, design, construction and construction oversight for the project.

NGPC: The NGPC can apply obtained grant funds through the U.S. Fish and Wildlife Services' SportFish Restoration Fund towards the construction costs of the fisheries portion of the recreational facilities at the sites. The NGPC obtained \$500,000 for recent sites constructed in the watershed, and a similar level of funding is anticipated for WP-1.

EPA Section 319 Grant Program: A 319 grant application through the Nebraska Department of Environmental Quality will be completed during the Professional Services phase of the project to assist in the costs associated with the construction of the water quality basin and with any additional improvements and/or public education efforts in the watersheds. It is anticipated that a request of approximately \$200,000 will be made.

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 long-term maintenance and operation of the site.

	Total Remaining Costs	FEDERAL			Remaining Costs	WSF Grant Request	Total Local Cost Share
		USFWS SRF	NDEQ Section 319	NRCS RCPP			
WP1							
Engineering, Planning and Permitting	\$1,712,214			\$1,150,000	\$562,214	\$337,328	\$224,886
Legal Services	\$25,000				\$25,000	\$15,000	\$10,000
Land Rights	\$3,285,000				\$3,285,000	\$1,971,000	\$1,314,000
<u>Capital Improvement Costs</u>							
Dam and Spillway							
Fishery Enhancements							
Water Quality Basins/Improvements	\$6,922,001	\$500,000	\$200,000	\$2,202,469	\$4,019,532	\$2,411,719	\$1,607,813
Recreation Facilities							
Totals	\$11,944,215	\$500,000	\$200,000	\$3,352,469	\$7,891,746	\$4,735,048	\$3,156,698

5. Support/Opposition

Discuss both support and opposition to the project, including the group or interest each represents.

Local recreators have tremendous interest in a new reservoir in the area. Trails and parks get abundant use within the urban areas, and this site will create a new opportunity and closer proximity to recreational opportunities in this part of the metro area. This site also creates new water access for boaters and anglers; site WP-1 presents a different approach, as there will be no motor boats allowed and a different fish stocking approach than the traditional reservoirs. Without motorboats, this will be ideal for kayakers and shore anglers. No local or direct opposition has been noted. Adjacent development is already planned and is adding to the many factors driving this project's schedule.