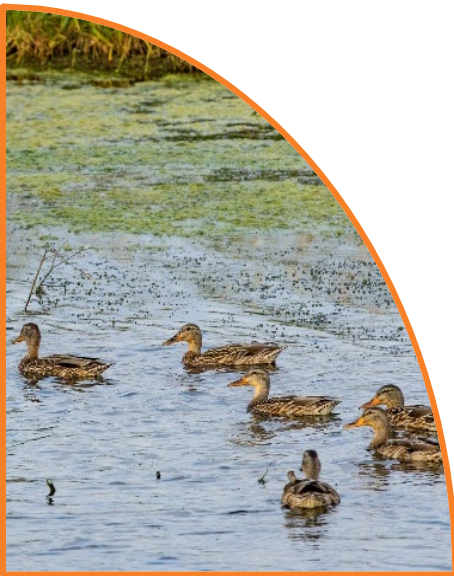


Papillion Creek

Watershed Management Plan

2024 Update



Executive Summary

E.1 Background and Purpose

The Papillion Creek Watershed Partnership (PCWP) was formed in August 2001 to address new development the Papillion Creek Watershed (Watershed) and prioritize stormwater management amongst all jurisdictions in the watershed. PCWP members presently consist of the City of Bellevue, Boys Town, City of Gretna, City of La Vista, City of Omaha, City of Papillion, City of Ralston, Sarpy County, and the Papio-Missouri River Natural Resources District (Papio NRD). In 2009, the Papillion Creek Watershed Management Plan (Plan) was finalized that developed solutions to address water quality and water quantity concerns within the rapidly developing watershed. Structural priority projects (Program Projects) and non-structural policies were among the solutions identified in the Plan, and an implementation plan was developed to outline the first set of action items.

E.2 2024 Review and Update

Every five years, a review of the Plan components and an update of the implementation plan for the next planning period is conducted. This 2024 Watershed Management Plan Update (2024 Update) represents the third iteration of updating the Plan (last update was in 2019) for the fiscal year (FY) planning period FY 2025 to FY 2029. It provides a summary of work completed within the Watershed since the 2019 Update, a review of the policies, and financial forecasting for all remaining structural projects. The financials were evaluated so the PCWP could develop their long-term and near-term funding strategies. This lays the framework for identifying the structural Program Projects that can be funded within the FY 2025 to FY 2029 Implementation Plan. Work completed in the last five years and findings from the 2024 Update include:

Concurrent Study, Planning, and Supplemental Funding Efforts:

General Reevaluation Study: The United States Army Corps of Engineers (USACE) completed a General Reevaluation Study to address flood risks within the Papillion Creek Watershed. Two Program Projects (DS-19 and DS-10) were recommended as projects that the USACE would support.

Watershed and Flood Prevention Operations (WFPO): The Papio NRD developed a Watershed Plan and Environmental Assessment with funding from the Natural Resources Conservation Service (NRCS) WFPO program that addressed water resources concerns in the Papillion Creek Watershed and recommended four streams for grade stabilization, one stream reach for restoration, and one sediment control basin with grade stabilization.

Grant Applications: Supplemental funding was obtained by successful grant awards. These included the Federal Emergency Management Agency's (FEMA) Building Resilient Infrastructure and Communities (BRIC) grant, Nebraska's Water Sustainability Fund (WSF), and the United States Fish and Wildlife Service's (USFWS) Sport Fish Restoration Grant funds by working in coordination with Nebraska Game and Parks (NGPC). In total, approximately \$16.3M of additional funds were obtained to put towards Program Projects.

Watershed Management Plan – Policy Evaluation: The policies were reviewed, and minor edits were made to update terminology and to simplify the policy document. More substantial efforts were put toward an evaluation of the stream setback policy. Based on stream erosion experienced in the Watershed and the risks of damage to public infrastructure and loss of private property, policy modifications were suggested to increase the setback area. Stakeholder outreach efforts were conducted and proposed

2024 Watershed Management Plan Update

policy updates were discussed with local jurisdictions, developers, and the PCWP. No modifications were agreed upon during the 2024 update, but it was agreed that assessments and discussions should continue to determine if modifications should be adopted in the future.

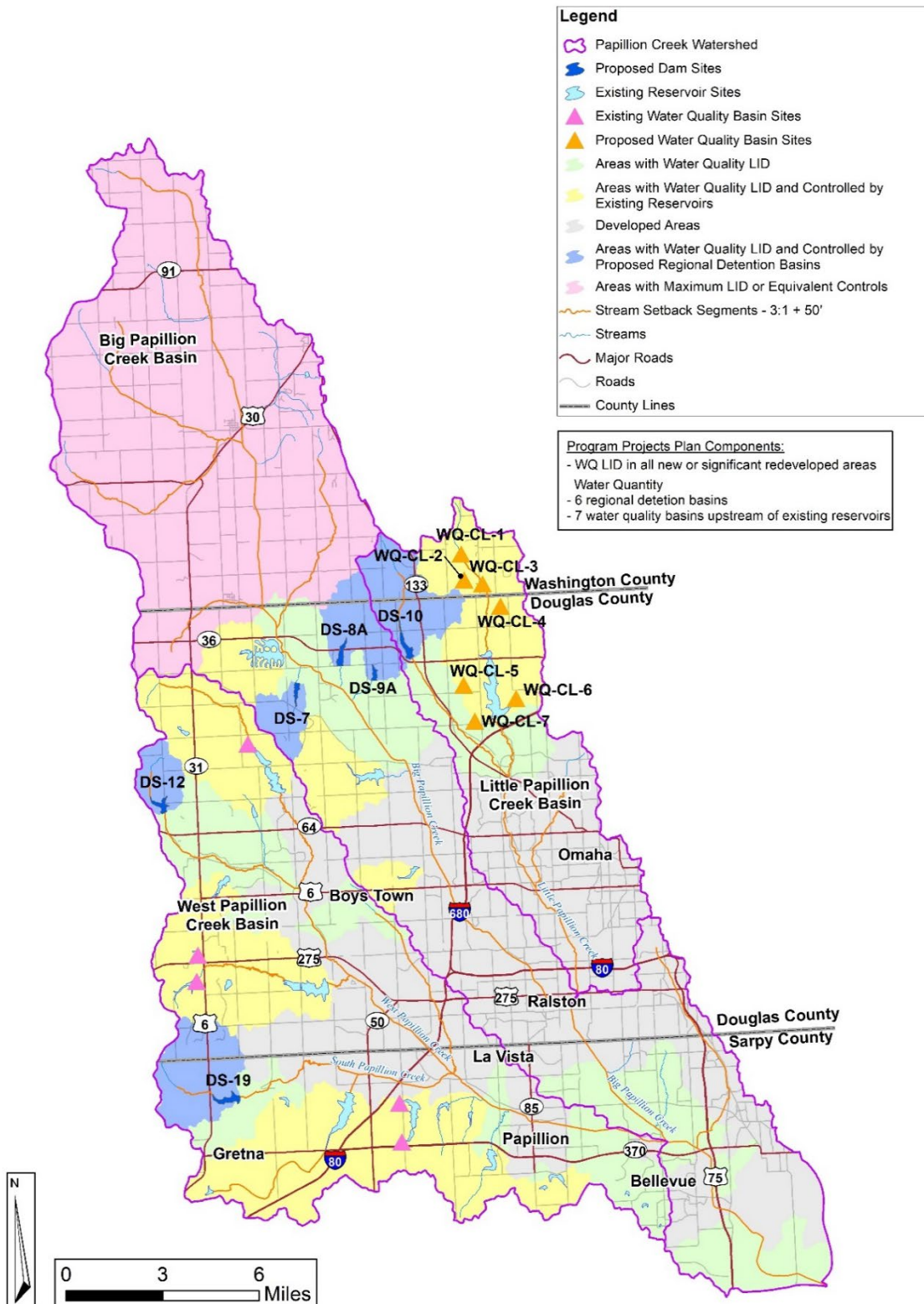
Watershed Management Plan – Status of FY 2019 to FY 2024 Program Projects: Program Projects identified in the 2019 Update were Regional Detention Basins WP-1, WP-2, and WP-4. The Papio NRD serves as the lead agency for project implementation on behalf of the PCWP and orchestrated the final design, land rights purchase, and construction bidding and oversight for all projects. [Table E-1](#) provides updated cost obligations of the FY 2019 to FY 2024 Program Projects and status. The estimated project costs shown in the 2019 Update were updated from 2018 to 2023 dollars for the three structures (\$35.1 million indexed to \$42.3 million). The current capital cost of these structures (\$40.5 million) came in slightly below the estimated cost when updated to 2023 dollars.

Watershed Management Plan – Remaining Program Projects: The 2024 Update summarizes remaining water quality and structural flood reduction projects. [Table E-1](#) shows the list of remaining Program Projects, along with updated estimated capital costs. The project sequencing is in the current order of priority based on development pressure. [Figure E-1](#) shows the locations of the remaining structural projects.

Table E- 1. Status of Program Projects

Structure Name	Approx. Location	Drainage Area (acres)	Total Project Capital Cost, 2023 Basis (Millions of \$) ¹	Current Status
2019 Plan Update Program Projects for Years FY 2020 to FY 2024				
WP-1	180th & Fort Streets	865	\$13.0	Anticipated construction completion in winter 2025
WP-2	180th St & Giles Road	705	\$12.2	Anticipated construction completion in spring 2025
WP-4	204th St & Schram Road	670	\$15.3	Anticipated construction completion in fall 2024
Total for FY 2020 to FY 2024			\$40.5	
Remaining Program Projects				
DS-12	216th & Fort Streets	1,660	\$30.4	Preliminary design complete Land rights purchase underway
DS-7	168th St & Bennington Road	1,675	\$27.2	Preliminary design complete Land rights purchase initiated
DS-19	192nd St & Giles Road	2,750	\$37.3	Preliminary design complete Land rights purchase underway USACE final design scheduled for 2025
DS-8A	144th St & Bennington Road	1,850	\$19.2	---
DS-9A	132nd St & Bennington Road	1,280	\$13.0	---
DS-10	120th St & Bennington Road	2,950	\$20.4	USACE preliminary design complete
Regional Detention Subtotal			\$147.5	
WQ-CL 1 through 7	Omaha & Washington Co.	4,470	\$102.1	---
Total Remaining			\$249.6	

Figure E- 1. 2024 Watershed Management Plan Update for Full Build-Out Conditions



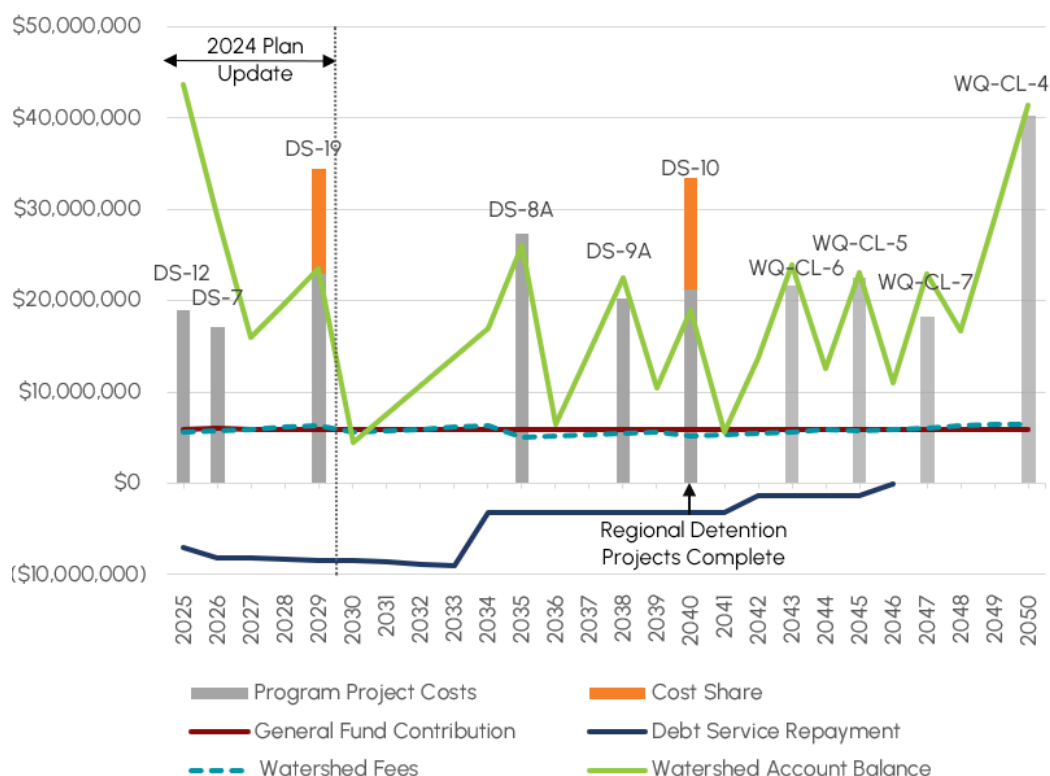
Financial Forecasting: An assessment of the PCWP financials compiled the revenues into the Watershed account (maintained by the Papio NRD) and expenditures associated with the remaining Program Projects. Financial models were developed to balance the cash flow into and out of the Watershed Account for various funding scenarios. Each modeling scenario identified the number of remaining Program Projects that could likely be completed within the entire planning period ending in FY 2050. These models were used to help identify a reasonable revenue generation strategy to fund the remaining Program Projects.

Updates were required to develop accurate estimates of the revenue sources. Watershed fees to be collected were determined based on updated fee rates and the area of land remaining for development. The Papio NRD General Fund contribution is a revenue stream included in the model which was estimated to be \$6M annually for the next 5-year planning increment. The Papio NRD has approximately \$20 million in remaining bonding capacity that was also considered as a potential revenue source along with potential eligible loans.

Project expenditures for Program Projects were updated based on the most current designs and cost estimates. All expenditures included in the cash flow scenarios, which includes capital costs for Program Projects and annual bond repayment obligations.

Several funding scenarios were studied for the 2024 Update. Figure E-2 depicts project funding Scenario 2.1 as a reasonable baseline means for project financing using a pay-as-you-go (P-A-Y-G) approach with bonding. Under this funding strategy, all the remaining six regional detention basin projects and four of the seven remaining water quality basin projects could be implemented within the 2050 planning horizon.

Figure E- 2. Scenario 2.1: P-A-Y-G with \$20M Bond (3.0% interest over 20-yr)



Implementation Plan – FY 2025 to FY 2029: The implementation plan addresses funding needs for the proposed Program Projects as follows:

- Capital costs for Program Projects for the next 5-year planning period
- Financial and administrative needs to implement the proposed Program Projects

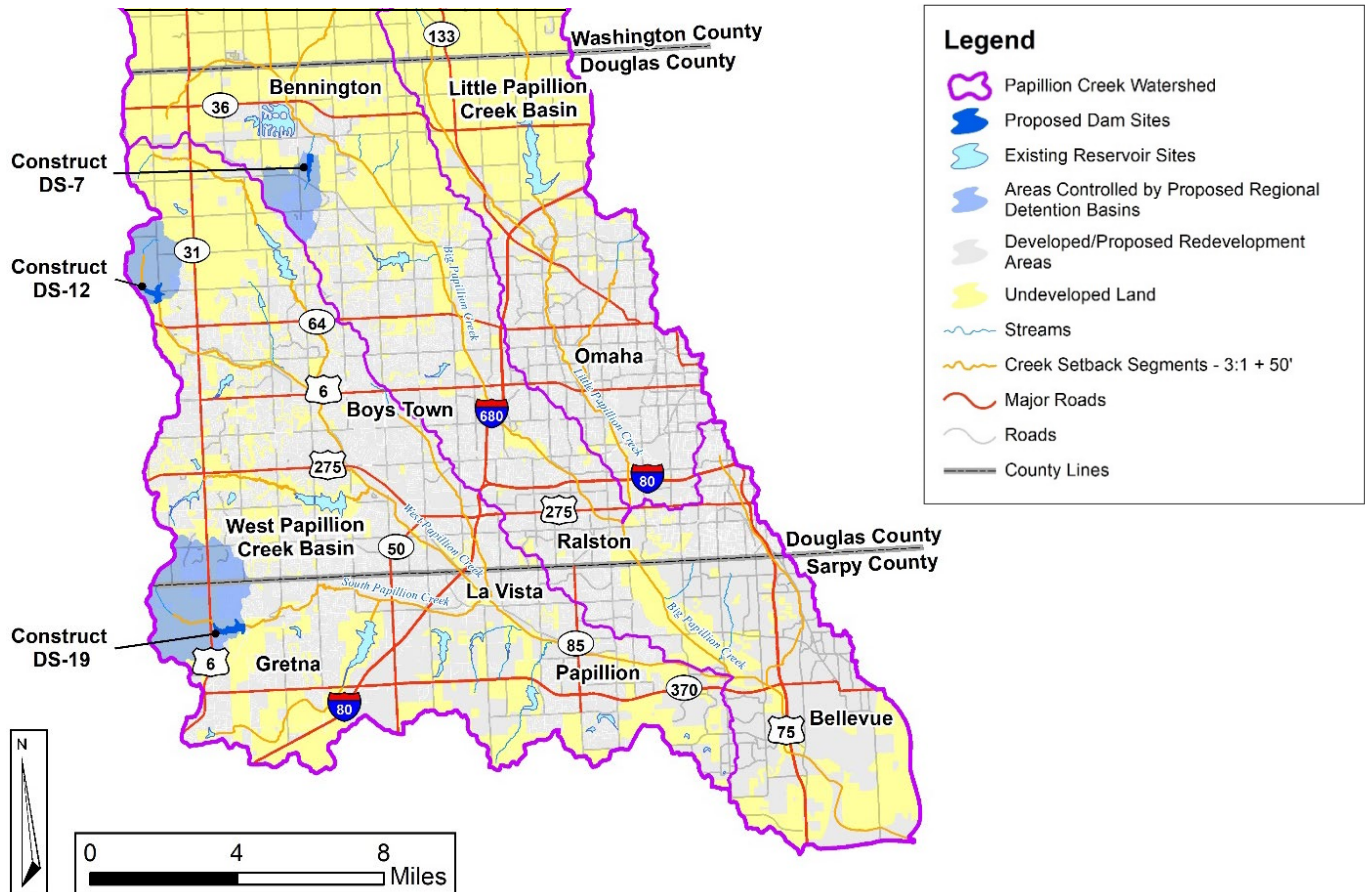
Table E-2 identifies the three structural Program Projects that were selected by the PCWP for the FY 2025 to FY 2029 implementation plan and their projected costs. The USACE will lead the implementation of DS-19 and has design slated to begin in 2025. The PCWP will not have control over this project schedule and cannot guarantee completion within the FY 2025 to FY 2029 implementation period. Additionally, a bond or loan will be required adequately fund the PCWP financial responsibilities for DS-19 within this period.

Table E-2. Implementation Plan - Program Projects for Years FY 2025 to FY 2029

Structure	Approximate Location & Planning Jurisdiction	Drainage Area (acres)	Est. Project Capital Costs, 2023 Basis, \$ Millions
DS-19	192 nd & Giles Road; City of Gretna	2,750	\$37.3
DS-12	216 th & Fort Streets; City of Omaha	1,660	\$30.4
DS-7	168 th & Bennington Road; City of Omaha	1,675	\$27.2
		Total	\$94.9

Figure E-3 represents the implementation plan, depicting the locations for the proposed three Program Projects for the FY 2025 to FY 2029 planning period.

Figure E-3. Papillion Creek Watershed Implementation Plan (FY 2025 to FY 2029)



E.3 Tracking Plan Success

Since the release of the Plan in 2009, the PCWP has dedicated time and resources towards successful implementation of plan components. Policies are being enforced and the PCWP continues to collect watershed fees to support future work. To complete a project, a multi-phase process that consists of design, permitting, land rights determination and purchase, and construction must be complete. The status of the PCWP milestones as of May 2024 is summarized in [Figure E-4](#).

Figure E-4. PWP Milestones

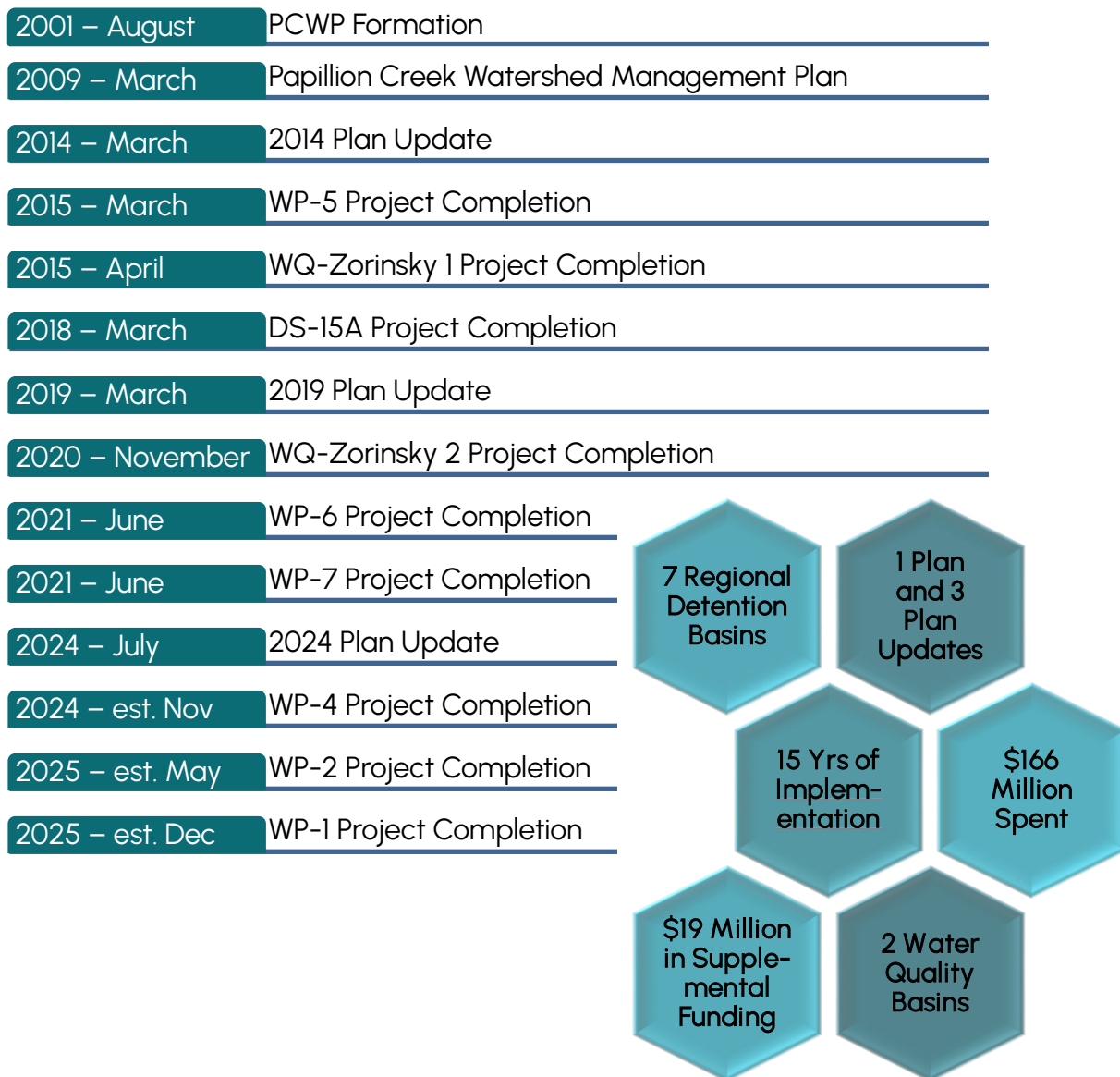


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B	Current Watershed Management Policies
C	Stakeholder Engagement Synthesis
D	Stream Stability Documentation

List of Acronyms and Terms

Term	Description
2019 Update	2019 Papillion Creek Watershed Management Plan Update
2024 Update	2024 Papillion Creek Watershed Management Plan Update
BRIC	Building Resilient Infrastructure and Communities
CWIFP	USACE Corps Water Infrastructure Financing Program
DS	Dam Site
EPA	Environmental Protection Agency
ETJ	Extra-Territorial Jurisdictions
Expenditures	Uses of funds
FEMA	Federal Emergency Management Agency
FY	Fiscal Year
LRIP	Long Range Implementation Plan
Max LID	Maximum Low Impact Development
MF	Multi-Family
NRCS	Natural Resources Conservation Service
NGPC	Nebraska Game and Parks
Papio NRD	Papio-Missouri River Natural Resources District
P-A-Y-G	Pay-As-You-Go
Plan	Papillion Creek Watershed Management Plan
Policies	Basic Administrative Framework
PCWP	Papillion Creek Watershed Partnership
RCPP	Regional Conservation Partnership Program
Revenues	Sources of Funds
SF	Single Family
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
Watershed	Papillion Creek Watershed
Watershed Fees	Watershed Management Fees
WFPO	Watershed and Flood Prevention Operations
WIFIA	Water Infrastructure Finance and Innovation Act
WP	West Papillion
WSF	Water Sustainability Fund
WQMP	Water Quality Management Plan

1 Update Purpose

This Papillion Creek 2024 Watershed Management Plan Update (2024 Update) is intended to provide interim progress on the work completed as part of the Papillion Creek Watershed Management Plan (Plan) completed in 2009. The 2019 Watershed Management Plan Update (2019 Update) identified the priority projects to be implemented within the fiscal year (FY) planning period FY 2020 to FY 2024. Therefore, this 2024 Update includes:

- Update on work that was identified in the 2019 Update completed within the last five (5) years
- Policy review and update efforts
- A review of the Watershed Management Fees (Watershed Fees) framework and rates
- Cost updates for remaining structural projects and the Implementation Plan for the structural Program Projects selected for potential funding and construction for the next planning period. For this 2024 Update, the next Program Project planning period has been established by the PCWP as a 5-year period extending from FY 2025 to FY 2029



Program Project (DS-15A) after completion

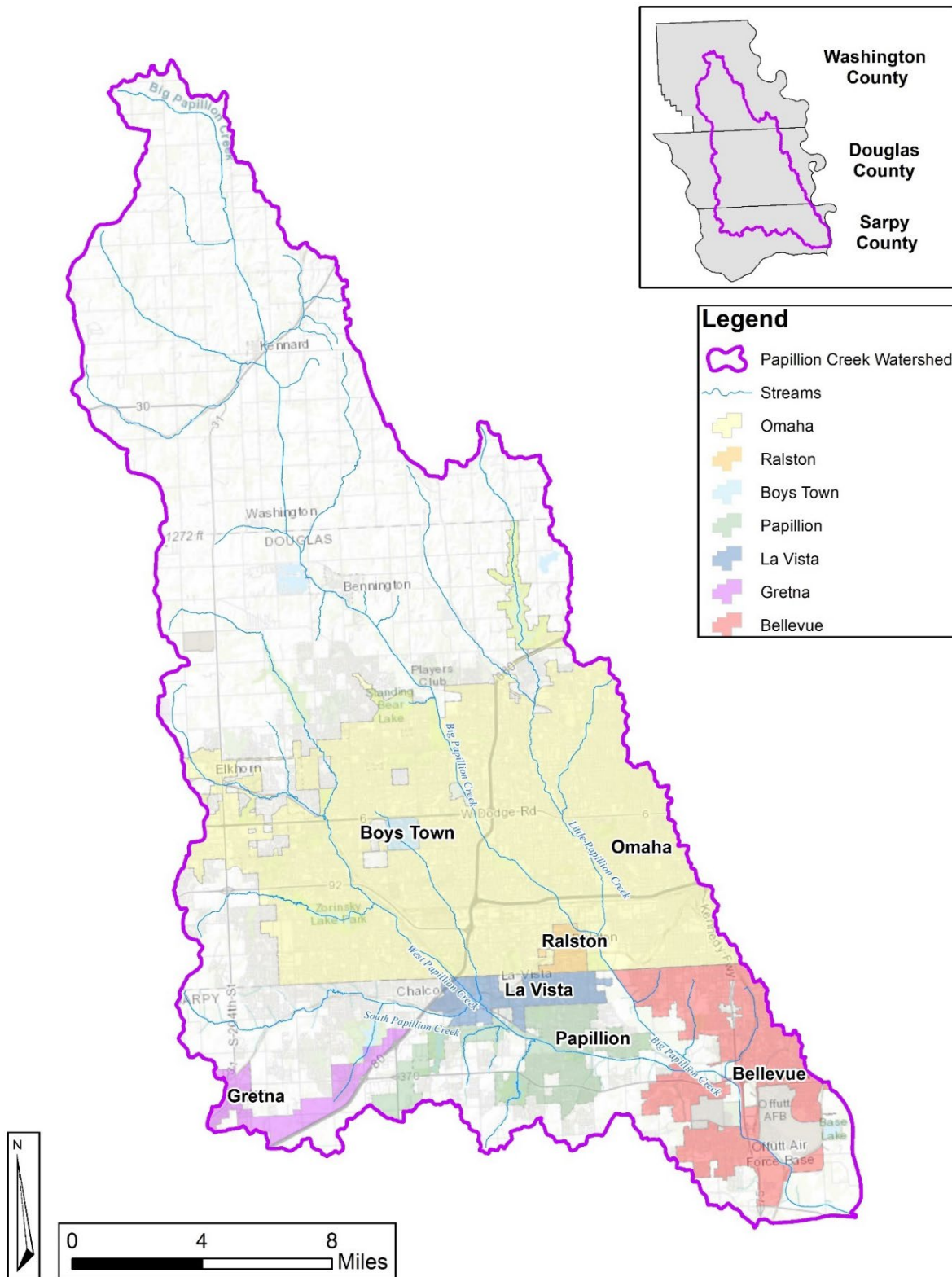
The 2024 Update does not include a description of current water quality impairments as the past updates have. A separate Papio-Missouri River Basin Water Quality Management Plan (WQMP) was developed to meet the Environmental Protection Agency (EPA) requirements of Section 319 of the Clean Water Act for developing nine-element watershed management plans. The Papio-Missouri River Natural Resources District (Papio NRD) and the City of Omaha partnered to complete the WQMP in order to address non-point source pollution and obtain 319 grant funding for eligible practices.

2 Watershed Information

2.1 Description

The Papillion Creek Watershed (Watershed) is depicted in [Figure 1](#) and drains an area of approximately 400 square miles (mi²). Approximately one-half of the Watershed is located within Douglas County, and the other half is divided nearly equally between Washington and Sarpy Counties. Primary streams in the Watershed include Big Papillion, Little Papillion, West Papillion, and Papillion Creeks. Little Papillion Creek drains approximately 60 mi² and flows into the Big Papillion Creek near 66th and Q Streets in Omaha. Big Papillion Creek has a drainage area of approximately 233 mi² and includes the tributary drainage area of Little Papillion Creek. The drainage area of West Papillion Creek is approximately 135 mi². The Big Papillion and West Papillion Creeks form Papillion Creek at their confluence near 36th Street and Gilmore Road in Bellevue. The following jurisdictions located within the Watershed are members of the PCWP: City of Bellevue, Boys Town, City of Gretna, City of La Vista, City of Omaha, City of Papillion, City of Ralston, Sarpy County, and the Papio NRD.

Figure 1. Papillion Creek Watershed



2.2 Concurrent Watershed Study, Planning and Supplemental Funding Efforts

Several concurrent efforts were on-going within the Watershed during the FY 2020 to FY 2024 implementation period. Each is described below.

Stream Degradation Study: In 2019 the Partnership engaged Felsburg, Holt, & Ullevig (FHU) to complete analysis of potential degradation in undeveloped areas of the Watershed. This study identified proposed changes to stream setback policies. This additionally led to a lateral migration potential analysis.

USACE Section 22 Stream Degradation Study: The United States Army Corps of Engineers (USACE) began a study that included a change detection analysis in the Watershed and suggestions for stream repair projects in areas that have experienced extreme degradation.

FEMA Erosion Mapping: As part of updating flood risk maps in the Watershed, FEMA completed analysis of the potential for stream erosion based on the updated hydraulic models. Impervious landcover near streams, and soil types.

General Reevaluation Study: USACE completed a General Reevaluation Study to address flood risks within the Papillion Creek Watershed. Two Program Projects (DS-19 and DS-10) were recommended as projects that the USACE would support.

Watershed and Flood Prevention Operations (WFPO): The Papio NRD developed a Watershed Plan and Environmental Assessment with funding from the Natural Resources Conservation Service (NRCS) WFPO program that addressed water resources concerns in the Papillion Creek Watershed. This study recommended four streams for grade stabilization, one stream reach for restoration, and one sediment control basin with grade stabilization. These structures do not overlap with PWCP Program Projects but will complement the goals of the Plan.

Grant Applications: Supplemental funding was obtained by the Papio NRD on behalf of the PCWP to support Program Projects. These included the Federal Emergency Management Agency's (FEMA) Building Resilient Infrastructure and Communities (BRIC) grant, Nebraska's Water Sustainability Fund (WSF), NRCS's Regional Conservation Partnership Program (RCPP), and the United States Fish and Wildlife Service's (USFWS) Sport Fish Restoration Grant funds by working in coordination with Nebraska Game and Parks (NGPC). In total, approximately \$16.3M of additional funds were obtained to put towards Program Projects. The awards per Program Project for each funding source is summarized in [Table 1](#).

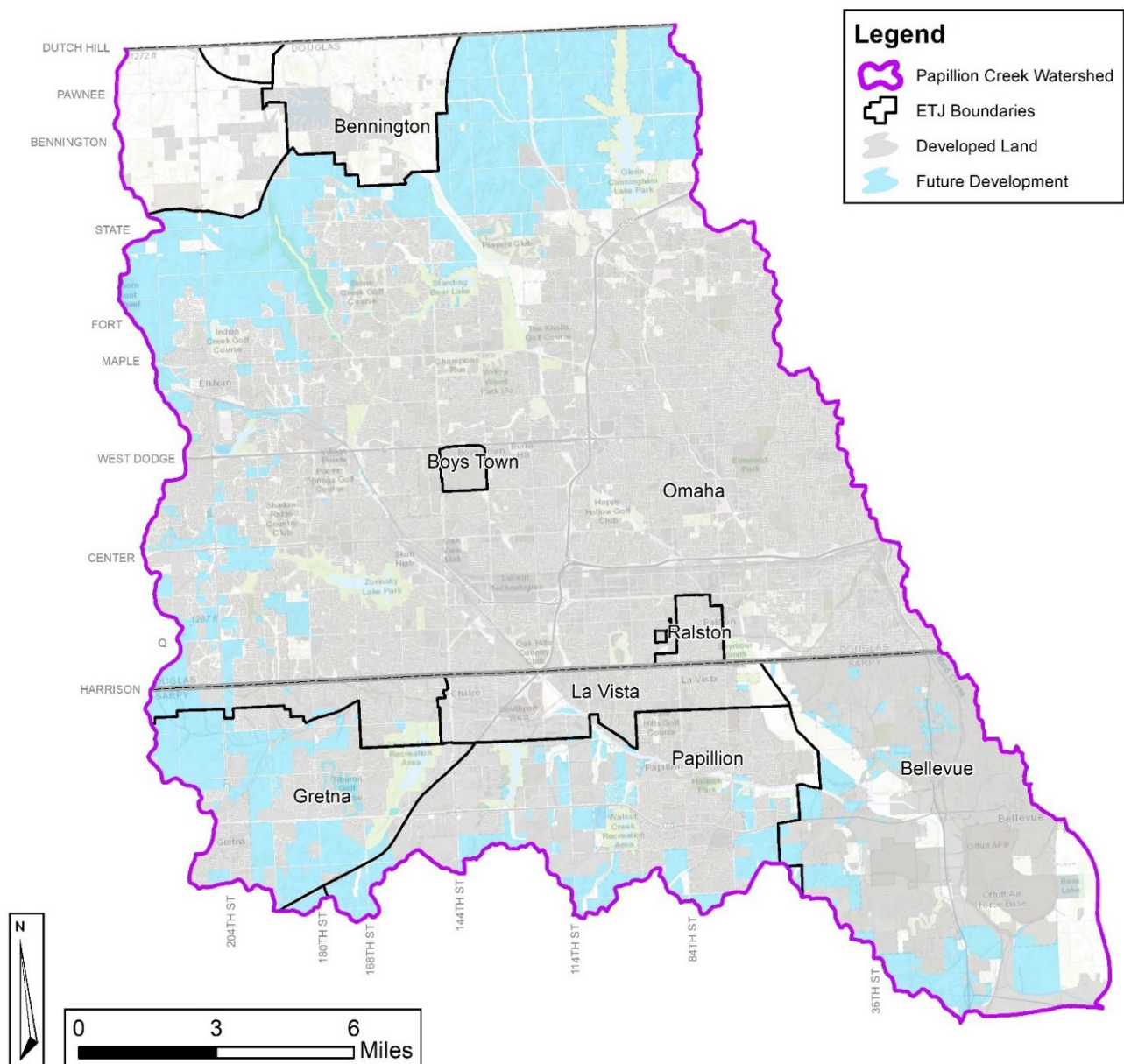
Table 1. Supplemental Funding Summary

Program Project	Grant Sources				
	WSF	FEMA/BRIC	NGPC/FWS	EPA 319	Total
WP-1	\$4,735,048	---	\$500,000	\$200,000	\$5,435,048
WP-2	\$4,171,204	---	\$325,000	---	\$4,496,204
WP-4	\$726,900	\$5,335,650	\$350,000	---	\$6,412,550
Total	\$9,633,152	\$5,335,650	\$1,175,000	\$200,000	\$16,343,802

2.3 Watershed Development

Development is rapidly expanding the urbanized area within the Watershed. [Figure 2](#) depicts developed area (i.e. residential, commercial and industrial land uses) and the land that is slated for future development within the Extra-Territorial Jurisdictions (ETJ) of PCWP member jurisdictions only. Future development is based on a comparison of baseline (2023) and future land use data. [Appendix A](#) summarizes the land use and population changes that were used to estimate Watershed Fees that will be collected as development continues. In the City of Omaha ETJ, development trends are expanding to the west and the northwest. Development to the west of Omaha's ETJ is near completion and the expansion to the north is anticipated to continue. The Cities of Gretna and Papillion are rapidly growing to the west and south; their growth is anticipated to continue within the Watershed boundary and beyond.

Figure 2. Current ETJ and Land Use Map in Douglas & Sarpy Counties



3 Watershed Management Plan

The 2009 Plan integrated water quality and peak flow reduction needs through a series of detailed evaluations of various strategies throughout the Watershed. Final Plan components include the placements of water quality measures within developments; regional detention basin for flood protection; water quality basins upstream of the regional detention basins; and a strategy termed Maximum Low Impact Development (Max LID), which was intended to provide an alternate means of both peak flow reduction and water quality protection in areas outside of the PCWP members' jurisdictions. Plan components are implemented through a series of policies and structural projects.

3.1 Policies

During development of the 2009 Plan, a set of six policies (listed below) were developed that identified requirements for any public or private development in the Watershed must follow. The policies were reviewed, and minor edits were made to update terminology and to simplify the policy document. See [Appendix B](#) for the updated policies.

POLICY GROUPS

- | | |
|---------------------------------|------------------------------------|
| 1. Water Quality Improvements | 4. Erosion and Sediment Control |
| 2. Peak Flow Management | 5. Floodplain Management |
| 3. Stream Corridor Preservation | 6. Stormwater Management Financing |

More substantial efforts were put toward an evaluation of the stream setback definition established in Policy Group #3. Based on stream erosion experienced in the Watershed and the risks of damage to public infrastructure and loss of private property, policy modifications were suggested to increase the setback area. Stakeholder engagement efforts were conducted and are summarized in [Appendix C](#). Modifications to the policy language were discussed and proposed policy updates were presented to the local jurisdictions, developers, and the PCWP. Ultimately, no modifications were agreed upon to include in the 2024 Update, but it was agreed that assessments and discussions should continue to determine if modifications should be adopted in the future.

3.2 Structural Components - Program Projects

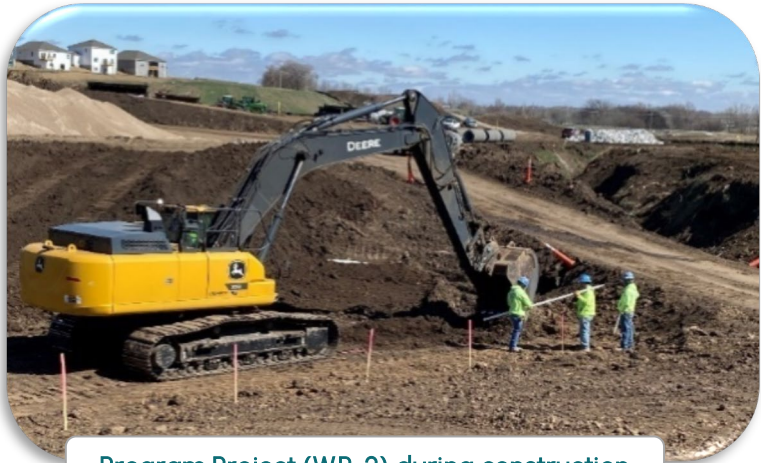
During development of the 2009 Plan, a suite of regional detention basins was screened for relative flood protection performance effectiveness and water quality basins for protection of existing and future reservoirs. In the 2009 Plan, fourteen (14) regional detention basins and seven (7) water quality basins were originally slated as Program Projects. Plan updates in 2014 and 2019 summarize progress of work completed in the first ten (10) years of implementation from FY 2010 to FY 2019.

FY 2020 to FY 2024 Program Projects Status

Program Projects in the 2019 Update implementation plan included WP-1, WP-2, and WP-4. Work required to complete each of these projects consisted of final design and permitting, land rights purchase, and construction. [Table 2](#) summarizes the status of the Program Projects that were progressed during the last five (5) year planning period and include the following:

- In April 2023, construction began on regional detention basin WP-4. Located in the City of Gretna; it is a flood control structure with a 15-acre reservoir contained within 80 acres of public recreation area. A closed loop trail around the lake will provide access to angler access features, along with native grasses and wildlife in the recreation area. Two kayak launches (one ADA accessible) will provide access to the no-wake lake, and three very large breakwater structures will provide angling opportunities into deep water. The fishing pier will allow for wheelchair access for ADA accessibility. The future Schram Road will also serve as the water quality basin embankment. The City of Gretna will take over ownership and maintenance of the recreation area, while the Papio NRD will maintain the dam structure. Construction completion is anticipated in the fall of 2024.

- Construction of regional detention basin WP-2 components was separated into two phases due to development pressure. A sanitary sewer line required for an adjacent neighborhood was designed beneath the water quality basin embankment upstream of WP-2. In 2021, sewer connections were needed, so the water quality basin (and associated sewer line) was bid ahead of schedule and was complete by the spring of 2022. Construction for the remaining



Program Project (WP-2) during construction

- project components began in October 2023. WP-2 is located in the City of Gretna on a tributary to the South Papillion Creek that controls over 700 acres of drainage area and will provide flood reduction benefits on the South, West and Big Papillion Creek branches. It is located at an existing NRCS grade control site, which is a small embankment that will be partially removed to accommodate the new dam structure. A stream mitigation project was developed for the segment downstream of the future dam. This work will stabilize the stream bed from future degradation, restore banks to stable slopes, and reuse cleared trees as habitat and bank stabilization features. The City of Gretna will take over ownership and maintenance of the recreation area, while the Papio NRD will maintain the dam structure. Construction completion is anticipated for the spring of 2025.
- Regional detention basin WP-1 construction will begin in the fall of 2024. WP-1 is located on a tributary to the West Papillion Creek in northwest Omaha. Controlling almost 900 acres of drainage area, this structure will provide flood attenuation through the heart of Omaha and down into the communities of Papillion and Bellevue. The site is predominately surrounded by development and will provide highly sought after local outdoor recreation opportunities. It will be located directly west of Elkhorn North High School, just across from 180th St. A water quality basin on the north end of the recreation area will provide an embankment to trap sediments and serve as a trail crossing to complete a closed loop around the lake. The recreation area will be managed by the City of Omaha upon completion, which is slated for the winter of 2025.
 - Due to development pressures, land rights for Program Projects outside the 2019 Plan Update had to be purchased ahead of schedule to ensure the necessary land was obtained by the Papio NRD

and not sold to a developer. The acquisition included land for the DS-7, DS-12 and DS-19 projects.

Remaining Program Projects

There are six (6) regional detention basins and seven (7) water quality basin projects remaining to be constructed. The updated Watershed Management Plan map depicts the status of each Program Project in [Figure 3](#). [Table 3](#) summarizes the estimated capital costs for the remaining regional detention basins and water quality basins. [Appendix A](#) contains additional cost breakdown details.

Table 2. Status of 2019 Implementation Plan for Years FY 2020 to FY 2024

Structure Name	Approx. Location & Planning Jurisdiction	Drainage Area (acres)	Project Funding Sources (Millions of \$)			Current Status
			NRD Fund & Watershed Fees	Other ¹	Total Project Expenditures ²	
2019 Program Projects for Years FY 2020 to FY 2024						
WP-1	180th & Fort Streets	865	\$7.6	\$5.4	\$13.0	Construction Begins Fall 2024 - completion in Winter 2025
WP-2	180th St & Giles Road	705	\$7.7	\$4.5	\$12.2	Under construction - completion in Spring 2025
WP-4	204th St & Schram Road	670	\$8.9	\$6.4	\$15.3	Under construction - completion in Fall 2024
2019 Program Projects Subtotal			\$24.2	\$16.3	\$40.5	---
Land Rights Purchase in FY 2020 to FY 2024						
DS-12	216th & Fort Streets; Omaha	1,660	\$12.5	---	\$12.5	Preliminary design complete Land rights purchase underway
DS- 7	168th Street & Bennington Road; Bennington/Omaha	1,675	\$11.6	---	\$11.6	Preliminary design complete Land rights purchase underway
DS- 19	192nd Street & West Giles Road; Sarpy County	2,750	\$7.7	---	\$7.7	Preliminary design complete Land rights purchase underway USACE final design scheduled for 2025
Land Rights Subtotal			\$31.8	---	\$31.8	---
Total			\$56.0	\$16.3	\$72.3	---

Notes:

WP= West Papillion

DS= Dam Site

[1] Other includes reimbursement for project enhancements by city or county and grant funding.

[2] Includes anticipated costs to complete 2019 Program Projects construction.

Figure 3. 2024 Watershed Management Plan Update for Full Build-Out Conditions

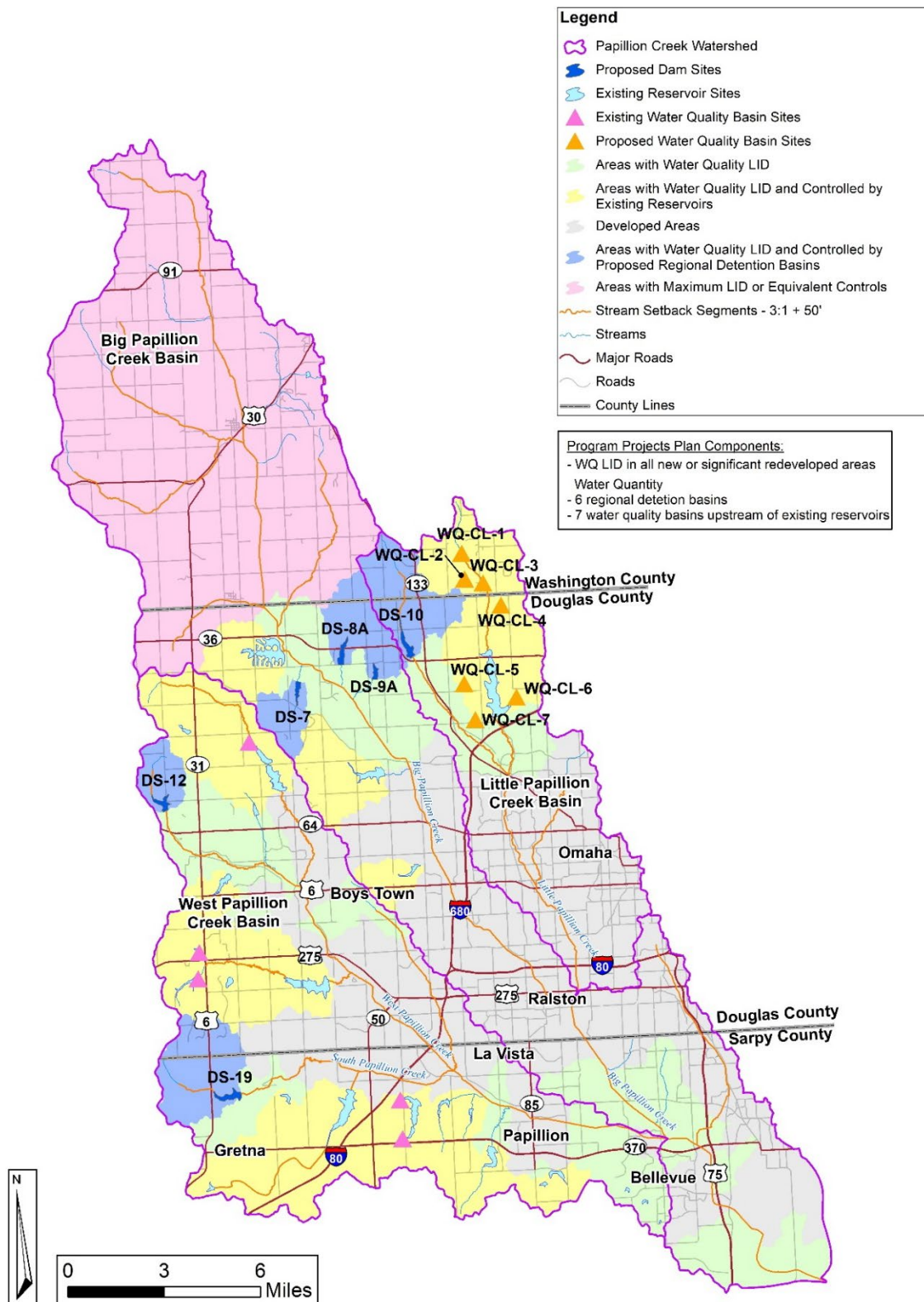


Table 3. Summary of Estimated Capital Costs for Remaining Projects

Structure Name	Stream Reach	Approx. Location/Jurisdiction	Drainage Area (acres)	Est. Normal Pool Area (acres)	Est. Project Costs, 2023 Basis (Millions of \$)		
					Construction Cost ¹	Real Estate Costs	Total Est. Project Capital Cost
DS-19	South Papillion Creek	192nd & Giles Road	2,750	74	\$17.4	\$19.9	\$37.3
DS-12	West Papillion Creek	216th & Fort Streets	1,660	43	\$14.1	\$16.3	\$30.4
DS-7	Trib. to Big Papillion Creek	168th & Bennington Road	1,675	43	\$12.2	\$15.0	\$27.2
DS-8A	Trib. to Big Papillion Creek	144th St & Bennington Road	1,850	75	\$8.8	\$10.4	\$19.2
DS-9A	Trib. to Big Papillion Creek	132nd & Bennington Road	1,280	38	\$6.5	\$6.5	\$13.0
DS-10	Thomas Creek	120th & Bennington Road	2,950	97	\$12.5	\$7.9	\$20.4
Regional Basin Subtotal					\$71.5	\$76.0	\$147.5
WQ-CL-6	Upstr. Cunningham Lake	Omaha	510	---	\$4.9	\$7.1	\$12.0
WQ-CL-5	Upstr. Cunningham Lake	Omaha	470	---	\$4.8	\$6.9	\$11.7
WQ-CL-7	Upstr. Cunningham Lake	Omaha	200	---	\$3.7	\$5.3	\$9.0
WQ-CL-4	Upstr. Cunningham Lake	Omaha & Washington Co.	915	---	\$7.5	\$10.6	\$18.1
WQ-CL-2	Upstr. Cunningham Lake	Washington Co.	845	---	\$7.2	\$10.3	\$17.5
WQ-CL-3	Upstr. Cunningham Lake	Washington Co.	790	---	\$7.0	\$9.9	\$16.9
WQ-CL-1	Upstr. Cunningham Lake	Washington Co.	740	---	\$7.0	\$9.9	\$16.9
Water Quality Basin Subtotal					\$42.1	\$60.0	\$102.1
Total Regional Detention and Water Quality Basins Total					\$113.6	\$136.0	\$249.6

Notes:

DS= Dam Site

WQ-CL=Water Quality-Cunningham Lake

[1] Construction costs include dam construction, utilities/infrastructure relocation/replacement, recreation construction, permitting and engineering.

4 Financial Assessment

The purpose of the financial assessment is to review how projects were funded in past five (5) years and understand the remaining financial requirements for Plan implementation. Each Plan update will assess options to fund the remaining Program Projects based on updated costs and the current economic environment and guide the PCWP in selecting projects to include in the next five (5) year Implementation Plan.

The funding goal for capital projects has been approximately 2/3 from public funding and 1/3 from private funding. This funding goal is commensurate with Policy Group #6: Stormwater Management Financing, included in [Appendix B](#). Public funding is from the Papio NRD and is an allocation of General Funds towards Plan implementation as described in the Papio NRD's Long Range Implementation Plan (LRIP). Private funding is generated by Watershed Fees paid by home builders or developers as described in Section 5.2. All PCWP finances are held in a special Watershed Account that is managed by the Papio NRD. The Papio NRD serves as the administrative agent for the PCWP as a public agency having inter-jurisdictional authority and has the capability for carrying out the construction of structural projects, as authorized by interlocal agreements within the PCWP.

Figures 4 and 5 approximate the revenues and expenditures as of the end of the Papio NRD's Fiscal Year 2023. To date, watershed fees have comprised approximately 14% of the total Program Project expenditures and 12% has come from outside funding sources.

Figure 4. Funding Source

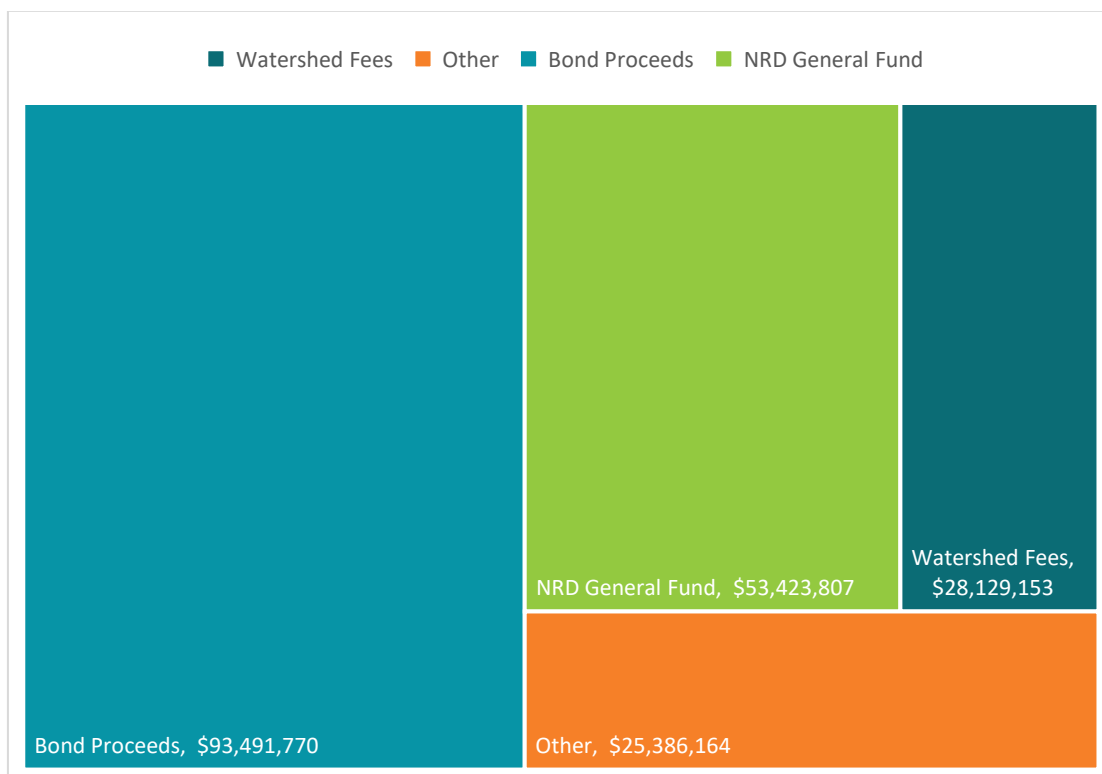
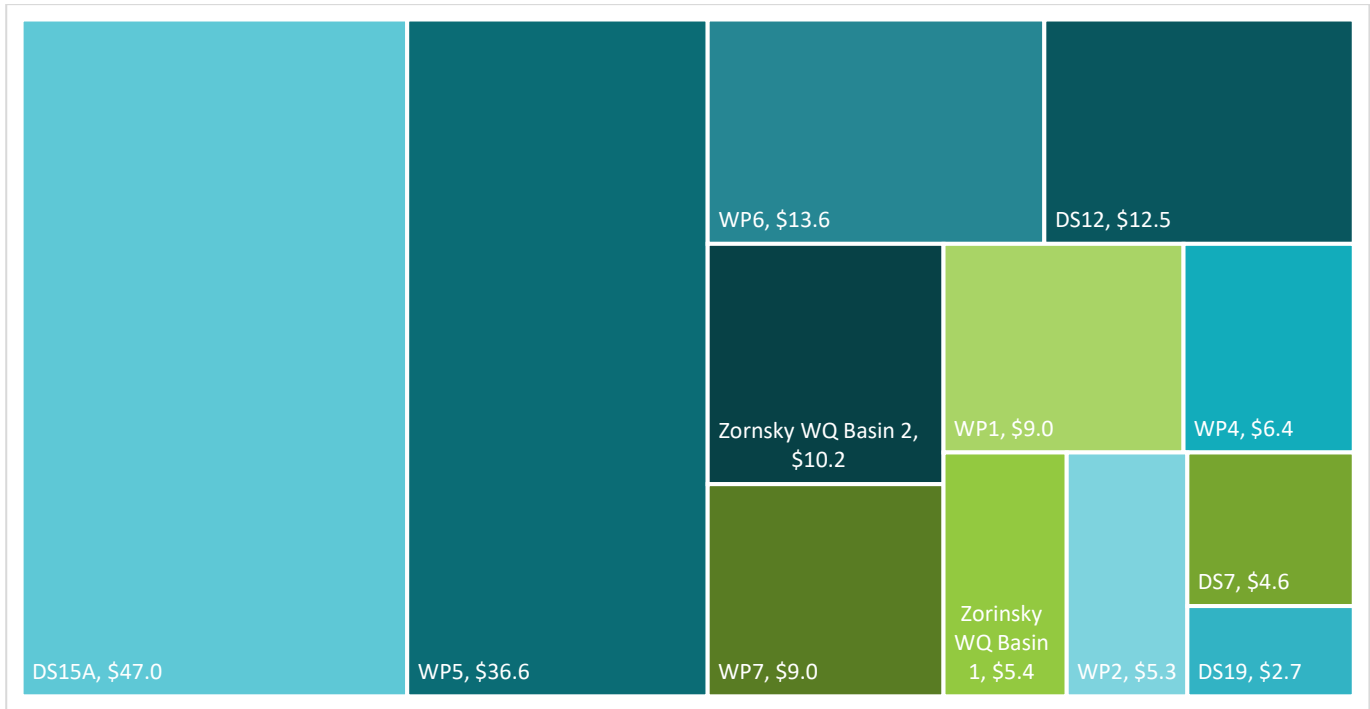


Figure 5. Project Costs to Date (in Millions)



4.1 Previous Program Projects Financial Approach

Program Projects identified for the previous FY 2020 to FY 2024 planning period were constructed with bond proceeds, General Fund allocations, and Watershed Fees as follows:

- The Papio NRD obtained bonding authority from the Nebraska Legislature in 2009. Bonding authority was to sunset in 2019, but in 2019 the Nebraska Legislature authorized a 5-year extension to 2024. Bond repayments are approximately \$7 million per year until three of the four bond repayments expire by 2034. Repayment will be reduced to approximately \$2 million per year until it expires in 2042.
- General Fund contributions: a review of the Watershed Account indicates the contribution from in General Fund from 2020-2024 averaged approximately \$5M per year.
- Watershed Fees: a review of the Watershed Account indicates the annual fees collected by PCWP members from 2020-2024 averaged approximately \$4M per year.

4.2 Remaining Program Projects Financial Assessment

The remaining Program Projects are identified in [Table 3](#) and locations of the proposed structures are located in [Figure 3](#). An assessment was performed to understand the financial requirements for implementing the remaining projects. This includes updates to available revenue source and project expenditures. A cash flow model was created to represent the inflows and outflows of the Watershed Account to predict the resulting balance on an annual time step. Model assumptions and funding mechanisms were applied to the model and several funding scenarios were developed to represent a variety of potential future conditions. The financial assessment of remaining projects is detailed in Sections 4.3 through 4.6.

4.3 Revenue Sources

Funds into the Watershed Account includes reserve balances carried over from the previous year, as well as the following revenue sources:

- General Fund Contribution: public funding from the Papio NRD General Fund collected via property tax mill levy on properties located within the district's boundary.
- Watershed Fees: Watershed Fees are collected by PCWP members through subdivision agreements at the time building permits are secured throughout the year. Watershed fees only apply to new development or significant redevelopment and are collected according to three different fee categories:
 - Single Family (SF) Residential: This classification includes low-density multi-family units up to 4-plexes. Fees are assessed per lot.
 - High-Density Multi-Family (MF) Residential: This classification includes multi-family units beyond 4-plexes. Fees are assessed per gross developable acre.
 - Commercial/Industrial: Fees are assessed per gross developable acre.
- Bond Proceeds: the Papio NRD bonding authority was extended until December 31, 2024, and they maintain the option to issue additional bonds to put towards Program Projects for FY 2025 to FY 2029. The Papio NRD has the remaining authority to issue up to \$20 million in bond proceeds.
- Loans: a new option investigated for FY 2025 to FY 2029 includes a loan through the USACE Corps Water Infrastructure Financing Program (CWIFP) that is authorized by the Water Infrastructure Finance and Innovation Act (WIFIA). Referred to as a WIFIA Loan, it is intended to enable local investment in infrastructure projects that enhance community resilience to flooding, promote economic prosperity, and improve environmental quality. WIFIA Loans are long term, low interest loans available to non-federal governments with projects (or groups of projects) over \$20 million. Current project eligibility is limited to existing infrastructure improvements for dam safety projects; however potential modifications to CWIFP could add new infrastructure projects for consideration. Therefore, the WIFIA Loan was assessed to understand its financial impact should it become an option during the next five (5) year Implementation Plan period.
- Cost Share: past Plan updates did not include potential cost share opportunities that may be obtained in the future, as financial details were undetermined, and no official agreements were in place. With the USACE General Reevaluation Study complete, the financial responsibilities for each agency have been identified and the cost share provided by the USACE for DS-19 and DS-10 can be accounted for in the financial assessment for this 2024 Update.
- Other (grants/donations): supplemental funding similar to the grants obtained during the previous FY 2020 to FY 2024 planning period will be pursued. Financial details are currently unknown and will not be relied upon for Program Project implementation.

4.4 Expenditures

Expenditure include costs for the implementation of projects and payments to debt services as follows:

- Capital costs for implementation of Program Projects include administrative, design and permitting fees, land rights and purchase services, and construction costs. Updated costs are presented in [Table 3](#) and outlined in more detail in [Appendix A](#).

- Debt Service Repayments:
 - Repayments of existing bonds according to bonding summaries prepared by the Papio NRD's bonding company, D. A. Davidson & Company, for bond issuances that are being used to finance the Program Projects.
 - Repayment of any additional bonds or loans obtained to finance Program Projects for the upcoming FY 2025 to FY 2029 period.

The Program Projects were incorporated into cash flow models in preferred sequence as listed in [Table 3](#), beginning with DS-19 and ending with the WQ-CL-1 water quality basin. The project sequence is based on several general factors:

- A need to provide the most performance-effective flood protection as early as possible in the overall program.
- Estimated population and land consumption trends provide the basic guidance for project timing as to when development platting may subsequently encroach on the structures in question. Related factors include: the probable "lead time" that is needed for land appraisals and land acquisition, engineering design time, permitting, and the time it takes to resolve various public utilities, and other infrastructure conflicts.
- Balancing project costs over time is a primary driver for affordability and overall project timing for implementation, deferral, or elimination. There may also be future opportunities for public-private partnerships to help make projects more viable.
- Completing or at least initiating all affordable projects in Douglas and Sarpy Counties prior to platting build-out within respective subbasins is highly desirable from both a cost and performance standpoint. Full platting build-out for the entire Watershed within Douglas County may occur by 2050 or slightly beyond, according to previous land consumption estimates and comments from the Omaha Planning Department. Similarly, full platting build-out within the Sarpy County portion of the Watershed has estimated to occur by 2050 due a recognized trend for a more rapid rate of growth.

4.5 Cash Flow Model Development

A cash flow model was developed to evaluate possible impact of various financing strategies within the PCWP budget on the implementation of the Plan. The cash flow model tracks sources of funds (revenues) and uses of funds (expenditures) over a 25-year planning horizon, beginning in 2025. Based on total revenues and expenditures following their historical trends, the model annually estimates the level of funds available for implementing the projects in their desired sequence. The available funds are assumed to be kept in a reserve or sinking fund until its balance is sufficient to fund the next upcoming project in the Implementation Plan. At the time of implementation, the fund is temporarily depleted, and reserves must again build-up until the subsequent project can be constructed. A similar revenue accrual and expenditure pattern must continue until all of the Program Projects in the Plan are constructed. The model development included:

1. Development of key model assumptions
2. Identification of funding mechanisms.

The Papio NRD provided the following background financial information that was used to update the financial cash-flow model:

- Bonding summaries prepared by the Papio NRD's bonding company, D. A. Davidson & Company, for four outstanding bond issuances that are being used to finance the Program Projects.
- A bond payment schedule that keys into the June 30th end of fiscal years from 2024 through the 2042 retirement of the last bond issued.
- The current design and construction status of the FY 2020 to FY 2024 Program Projects (as presented in [Table 2](#)).
- Papio NRD budget information for FY 2024.
- Watershed Account of revenues and expenditures from FY 2010 through FY 2023.

Key Model Assumptions

The model structure and logic follow straightforward sources and uses of funds analysis. Model assumptions developed for critical inputs include:

1. Watershed Account Balance: the beginning balance for the Watershed Account includes the remaining balance from the past implementation period plus any bond or loan scenario, the value is added to the remaining balance in the first year (FY 2025) of the planning horizon.
2. Regional Growth: it was assumed that population in the Papillion Creek Watershed would increase based on projections derived from the MAPA 2050 Model.
3. Inflation Rate: price levels for the capital costs of the Program Projects are assumed to increase 3 percent per year based on a long-run average of the Consumer Price Index.
4. General Fund Contribution: public funding from the Papio NRD General Fund is based on an assumed allocation to the Watershed Account of \$6 Million per year in line with the Papio NRD's Long Range Implementation Plan (LRIP).
5. Annual Watershed Fee Increases: Watershed Fees are linked to inflation with an assumed long-run average of 3 percent over time based on an average of construction cost indices.
6. Papio NRD Decision to Bond: the Papio NRD has a remaining authority to issue up to approximately \$20 million in bonds. In scenarios where bonding is used, it assumed that all remaining bonding authority will be used in the next planning periods (FY 2025 to FY 2029).
7. Financing Terms for Bonding: it was assumed that bond payments would be the principal amortized over 20 years based on a review of previous bonds issued by the Papio NRD. Interest rates are currently higher than past terms, therefore scenarios were developed for existing rates (4.5%) and rates experienced in the past (3%) that could be attained if market trends continue to decrease.
8. Financing Terms for WIFIA Loan: as a new funding mechanism and no set of previous terms that the Papio NRD has preference towards, a range of loan repayment schedules and interest rates were applied. Modeled scenarios reflect loan payments to be amortized over a range of 20 years to 35 years. The WIFIA Loans are issued at federal prime interest rates. D. A. Davidson & Company provided the current rate at 3.1% and projects that rates could be lower in the future. Modeled scenarios included interest rates at 3.1% and 2.0% to represent a range of potential conditions.
9. Program Project Sequence: the preferred implementation order in which Program Projects were inserted into the cash flow model based on factors described in Section 4.4.

Funding Mechanisms

These inputs were linked to three funding mechanisms: pay-as-you-go (P-A-Y-G), bonding with P-A-Y-G, or a WIFIA Loan with P-A-Y-G. The model development is described in more detail below. The cash flow model considers three (3) funding mechanisms to develop a range of the modeling scenarios described in Section 4.6:

1. P-A-Y-G: the first funding mechanism is a continuance of the strategy developed in the 2009 Plan, whereby implementation continues on a P-A-Y-G basis. Under this mechanism, the projects are implemented utilizing a combination of General Fund revenue allocations from the Papio NRD and Watershed Fees.
2. Bonding with P-A-Y-G: the second funding mechanism adds Papio NRD bonding authority to P-A-Y-G. The Papio NRD has capacity to issue additional bonds with a cap of total annual debt service for all bonds not to exceed 1 percent of the district's total property tax valuation (currently \$20 million remaining in bonding authority). When bonding is used, the Papio NRD would reduce its allocation of General Funds to the Watershed Account to cover the costs of bond issuance (annual debt service). In modeled scenarios, debt service is treated as a project expenditure while the General Fund contribution remains consistent with the LRIP.
3. WIFIA Loan with P-A-Y-G: the third funding mechanism add a WIFIA loan to P-A-Y-G. When a loan is used, the Papio NRD would reduce its allocation of General Funds to the Watershed Account to cover the costs of the loan repayment (annual debt service). In modeled scenarios, debt service is treated as a project expenditure while the General Fund contribution remains consistent with the LRIP.

4.6 Modeled Scenarios and Results

The funding mechanisms were combined with the model assumptions to form financing scenarios described below in [Table 4](#). These financing scenarios represent a range of potential financial pictures for project implementation. Details for Scenarios 1.0, 2.1 3.1, 3.2, and 3.3 are provided for further consideration since they present a variety of options that could be available to the PWCP for implementation depending on the future economic climate. See [Appendix A](#) for additional information on all scenarios evaluated.

Cash flow projections from the model are presented graphically for each funding scenario in [Appendix A](#). Scenarios 1.0, 2.1 3.1, 3.2, and 3.3 are shown in [Figures 6 through 10](#) and key model outputs are summarized in [Table 5](#). The figures include revenue streams and expenditures on projects, and the cumulative Watershed Account balance represents the resulting cash flow from these transactions. Key model outputs that were derived include:

1. Number of Program Projects completed in the next implementation period of FY 2025 to FY 2029.
2. Year in which all regional detention projects will be complete.
3. Cost of all regional detention projects (capital costs vary based on the rate of implementation due to inflation per assumption #2), plus any additional debt service incurred to implement regional detention for a total cost.
4. Number of water quality basins implemented within the planning horizon (by 2050).

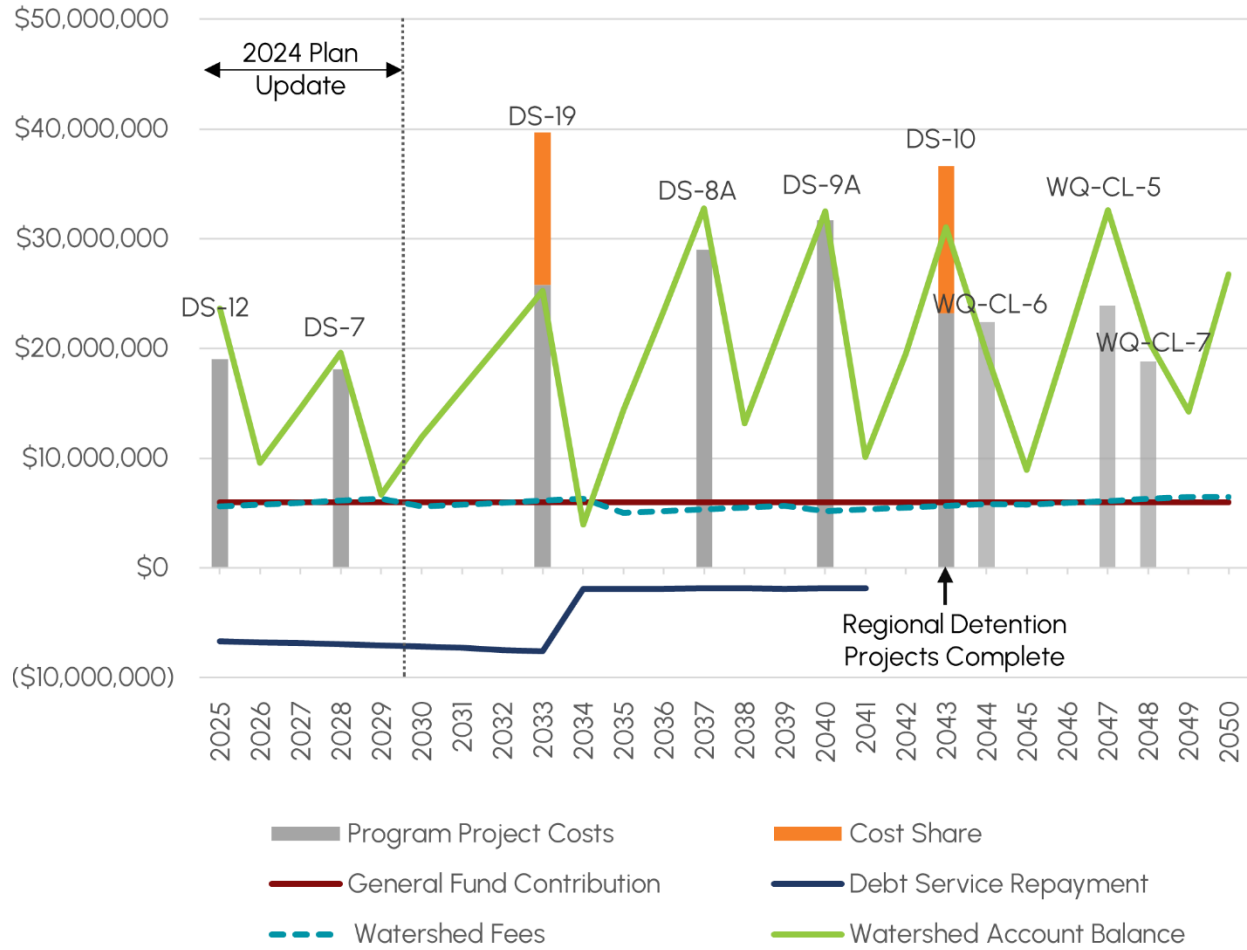
Table 4. Funding Scenarios Evaluated

Scenario	Funding Mechanism	Watershed Fees	Papio NRD Allocation	Financing Terms	
				Interest Rate	Repayment Period
1.0	P-A-Y-G	Current Rates with Inflation	General Fund Contribution	---	---
2.1	P-A-Y-G + Bond	Current Rates with Inflation	General Fund Contribution + \$20M Bond	3.0%	20 Yrs
2.2		Current Rates with Inflation	General Fund Contribution + \$20M Bond	4.5%	20 Yrs
3.1	P-A-Y-G + WIFIA Loan	Current Rates with Inflation	General Fund Contribution + \$30M WIFIA Loan	3.1%	35 Yrs
3.2		Current Rates with Inflation	General Fund Contribution + \$30M WIFIA Loan	2.0%	35 Yrs
3.3		Current Rates with Inflation	General Fund Contribution + \$46M WIFIA Loan	3.1%	35 Yrs
3.4		Current Rates with Inflation	General Fund Contribution + \$30M WIFIA Loan	2.0%	20 Yrs
3.5		Current Rates with Inflation	General Fund Contribution + \$46M WIFIA Loan	2.0%	35 Yrs
3.6		Current Rates with Inflation	General Fund Contribution + \$30M WIFIA Loan	3.1%	20 Yrs

A general description of components included in [Figures 6](#) through [10](#) is summarized below:

- The long-term planning horizon utilized was 25 years (FY 2025 to FY 2050).
- The next Program Projects cycle is highlighted from FY 2025 to FY 2029.
- The red line represents the contribution of annual funds from the PAPIO NRD's General Fund.
- The blue dashed line represents the annual contribution of Watershed Fees.
- The green solid line represents the cumulative funds available in the Watershed Account
- The gray bars represent the estimated cost of the project.
- The navy-blue line represents the existing bond repayment plus any new debt repayment associated with the modeled scenario.
- The orange bars represent planned cost share from the USACE.

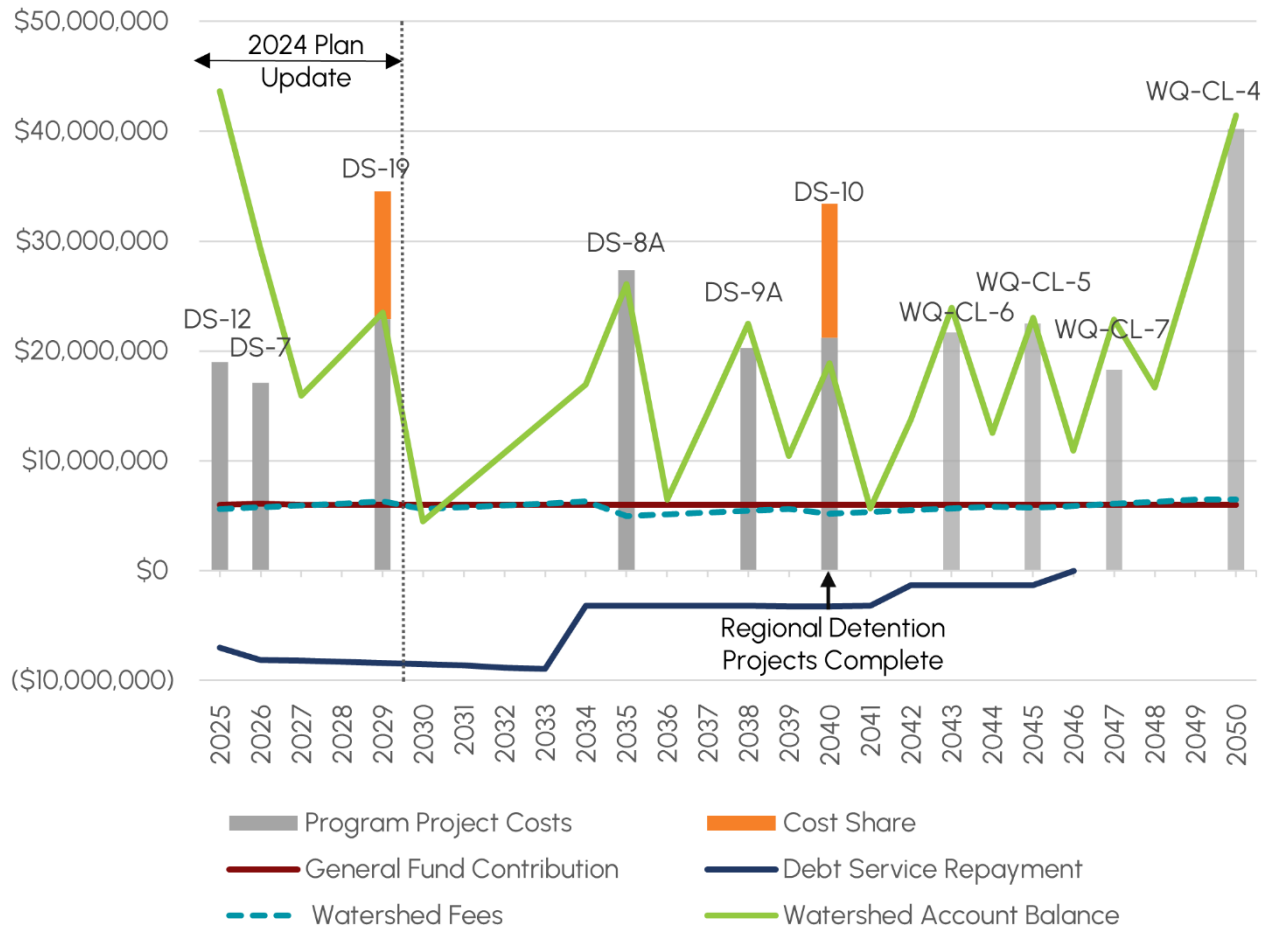
Figure 6. Scenario 1.0: P-A-Y-G



Scenario 1.0 Key Model Outputs:

1. Two (2) projects will be constructed in the next planning period (FY 2025 to FY 2029).
2. All regional detention structures will be complete by 2043.
3. Regional detention project cost of \$146.8 million (with no additional dept service).
4. Three (3) water quality basins can be constructed within the planning horizon (2050).

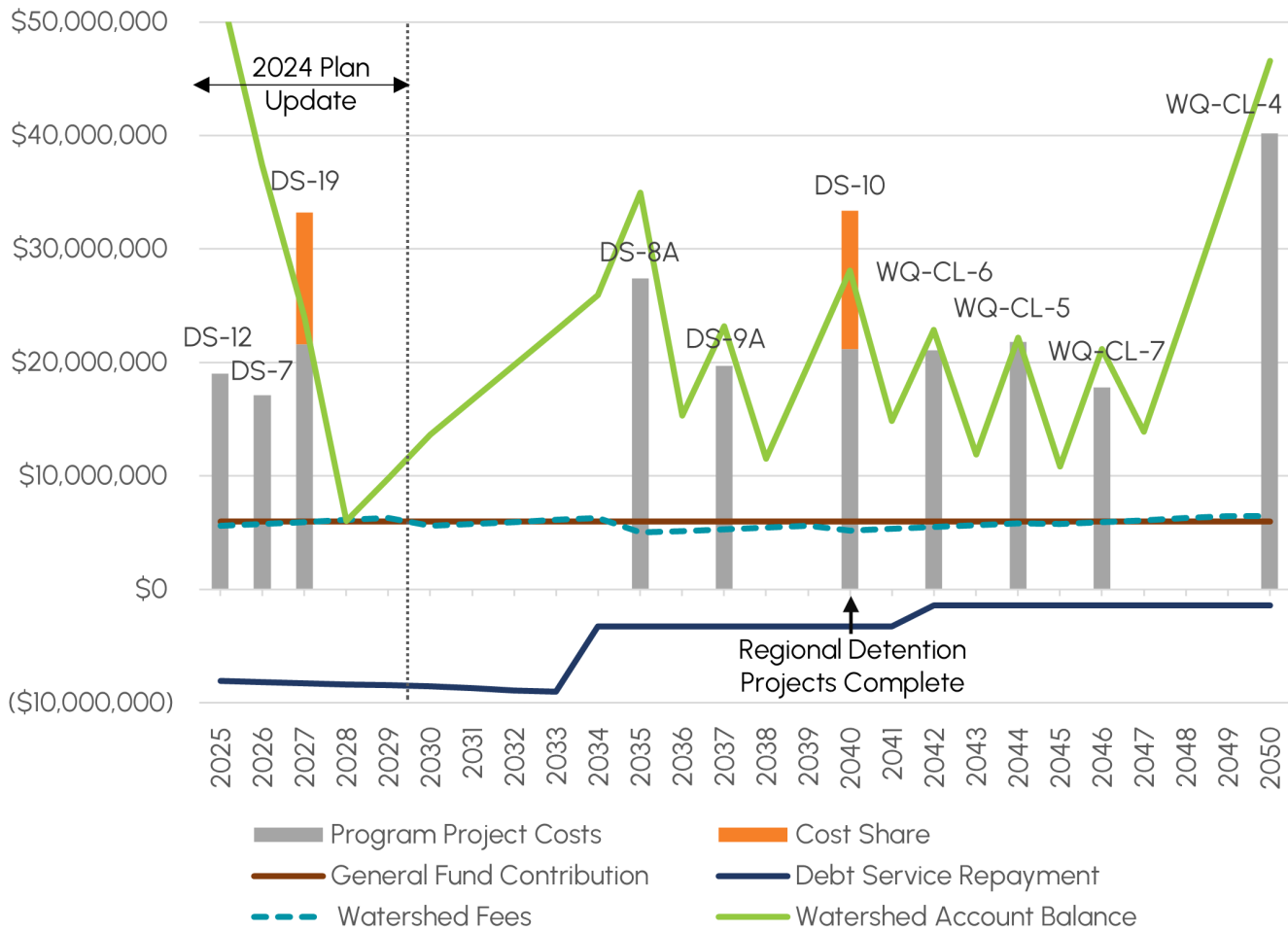
Figure 7. Scenario 2.1: P-A-Y-G with \$20M Bond (3.0% interest over 20-yrs)



Scenario 2.1 Key Model Outputs:

1. Three (3) projects will be constructed in the next planning period (FY 2025 to FY 2029).
2. All regional detention structures will be complete by 2040.
3. Regional detention project cost of \$127.9 million, plus \$6.9 million in additional dept service for a total regional detention cost of \$134.8 million.
4. Four (4) water quality basins can be constructed within the planning horizon (2050).

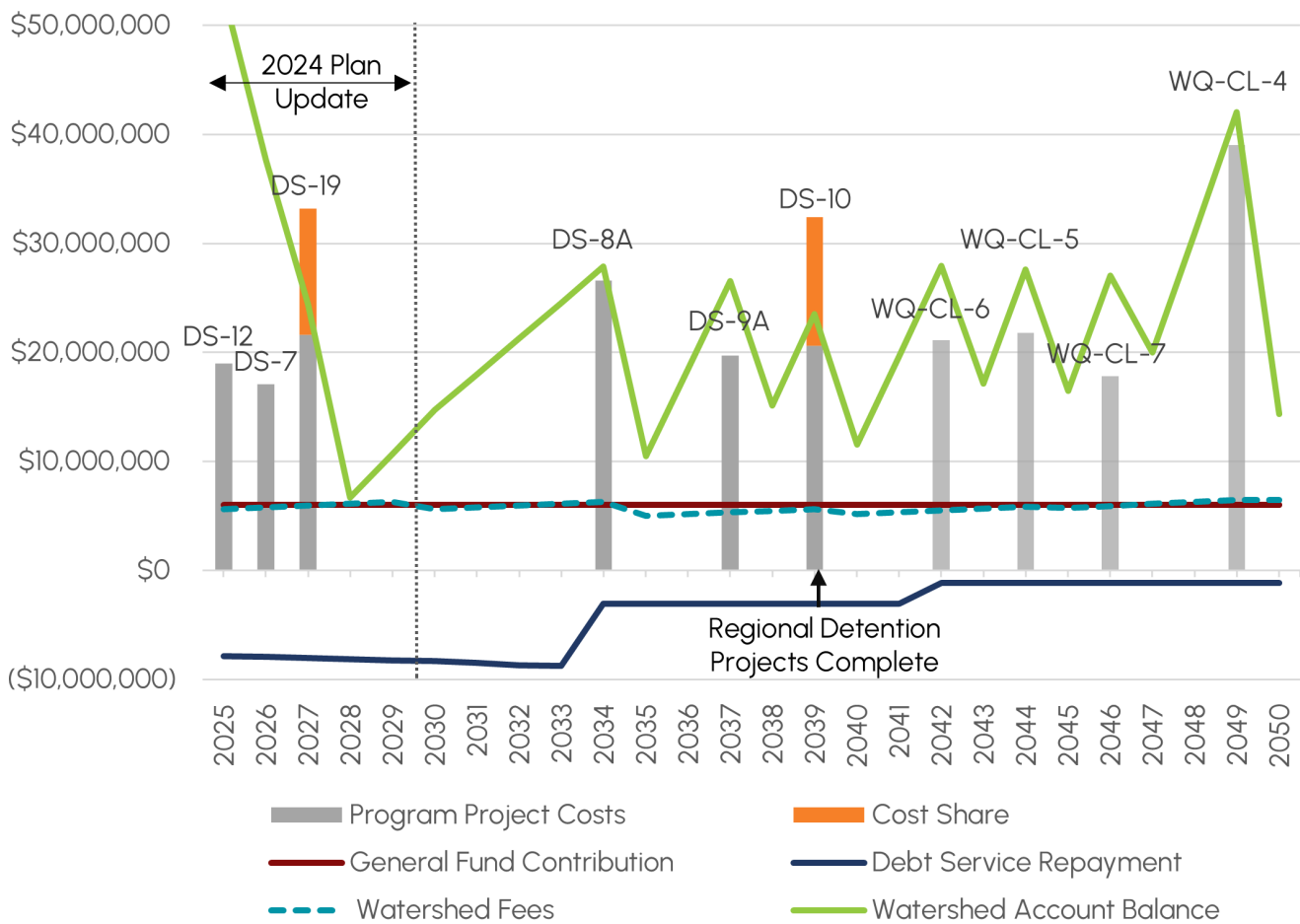
Figure 8. Scenario 3.1: P-A-Y-G with \$30M WIFIA Loan (3.1% interest over 35-yrs)



Scenario 3.1 Key Model Outputs:

1. Three (3) projects will be constructed in the next planning period (FY 2025 to FY 2029).
2. All regional detention structures will be complete by 2040.
3. Regional detention project cost of \$126.0 million, plus \$19.2 million in additional dept service for a total regional detention cost of \$145.2 million.
4. Three (3) water quality basins can be constructed within the planning horizon (2050).

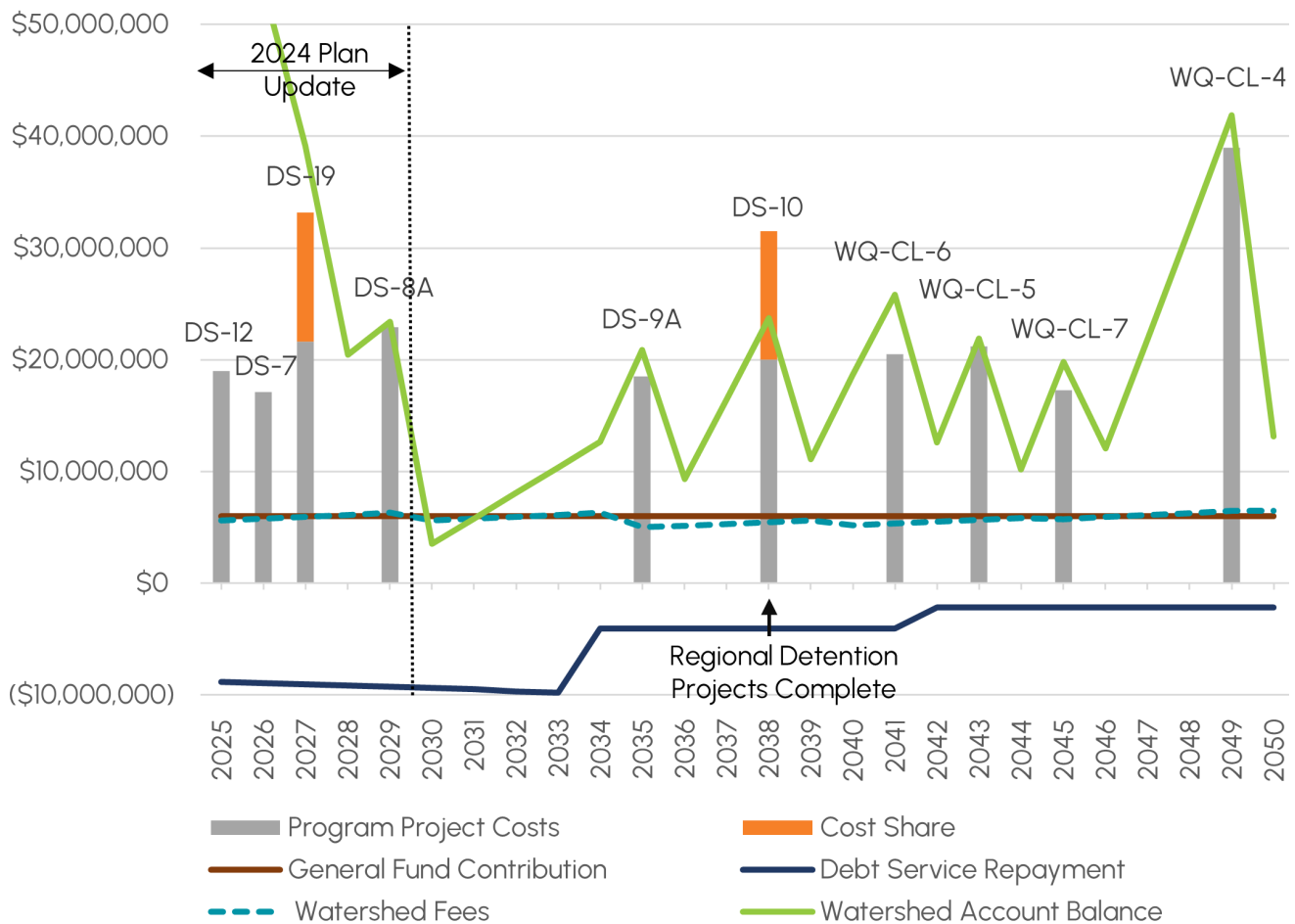
Figure 9. Scenario 3.2: P-A-Y-G with \$30M WIFIA Loan (2.0% interest over 35-ys)



Scenario 3.2 Key Model Outputs:

1. Three (3) projects will be constructed in the next planning period (FY 2025 to FY 2029).
2. All regional detention structures will be complete by 2039.
3. Regional detention project cost of \$124.6 million, plus \$11.7 million in additional dept service for a total regional detention cost of \$136.3 million.
4. Four (4) water quality basins can be constructed within the planning horizon (2050).

Figure 10. Scenario 3.3: P-A-Y-G with \$46M WIFIA Loan (3.1% interest over 35-ys)



Scenario 3.3 Key Model Outputs:

1. Four (4) projects will be constructed in the next planning period (FY 2025 to FY 2029).
2. All regional detention structures will be complete by 2038.
3. Regional detention project cost of \$119.1 million, plus \$30.1 million in additional dept service for a total regional detention cost of \$149.2 million.
4. Four (4) water quality basins can be constructed within the planning horizon (2050).

Table 5 summarizes the results of Scenarios 1.0, 2.1 3.1, 3.2, and 3.3 reported above that reflect financing options for the 25-year planning horizon and projects that could be completed in the next Program Project cycle from FY 2025 to FY 2029. Bonding and loan scenarios allow for immediate funding of projects but imposes a long-term debt service requirement. However, these additional funds upfront will increase the rate of project implementation and reduce future inflation costs that are projected onto capital costs (per assumption 2).

Table 5. Summary of Key Model Outputs

Scenario			# Projects Complete 2025-2029	Year Regional Detention Complete	Regional Detention Costs (\$ in Millions)	Additional Debt Service (\$ in Millions)	Total Regional Detention Cost (\$ in Millions)	# Water Quality Basins*
Method	Interest Rate	Repayment Schedule						
1 - PAYG	---	---	2	2043	\$146.8	\$0.0	\$146.8	3
2.1 - PAYG + \$20M Bond	3.0%	20 Yrs	3	2041	\$127.9	\$6.9	\$134.8	4
3.1 - PAYG + \$30M Loan	3.1%	35 Yrs	3	2040	\$126.0	\$19.2	\$145.2	3
3.2 - PAYG + \$30M Loan	2.0%	35 Yrs	3	2039	\$124.6	\$11.7	\$136.3	4
3.3 - PAYG + \$46M Loan	3.1%	35 Yrs	4	2038	\$119.1	\$30.1	\$149.2	4

5 Implementation Plan

The Implementation Plan in the 2009 Report primarily dealt with the administrative and financial requirements necessary to initiate the Plan. Since the basic administrative framework (policies) are already in place, the Implementation Plan within subsequent updates is primarily intended to provide updated capital cost estimates and recommended Program Projects that can be considered for the next immediate planning period.

5.1 Structural Components: Program Projects

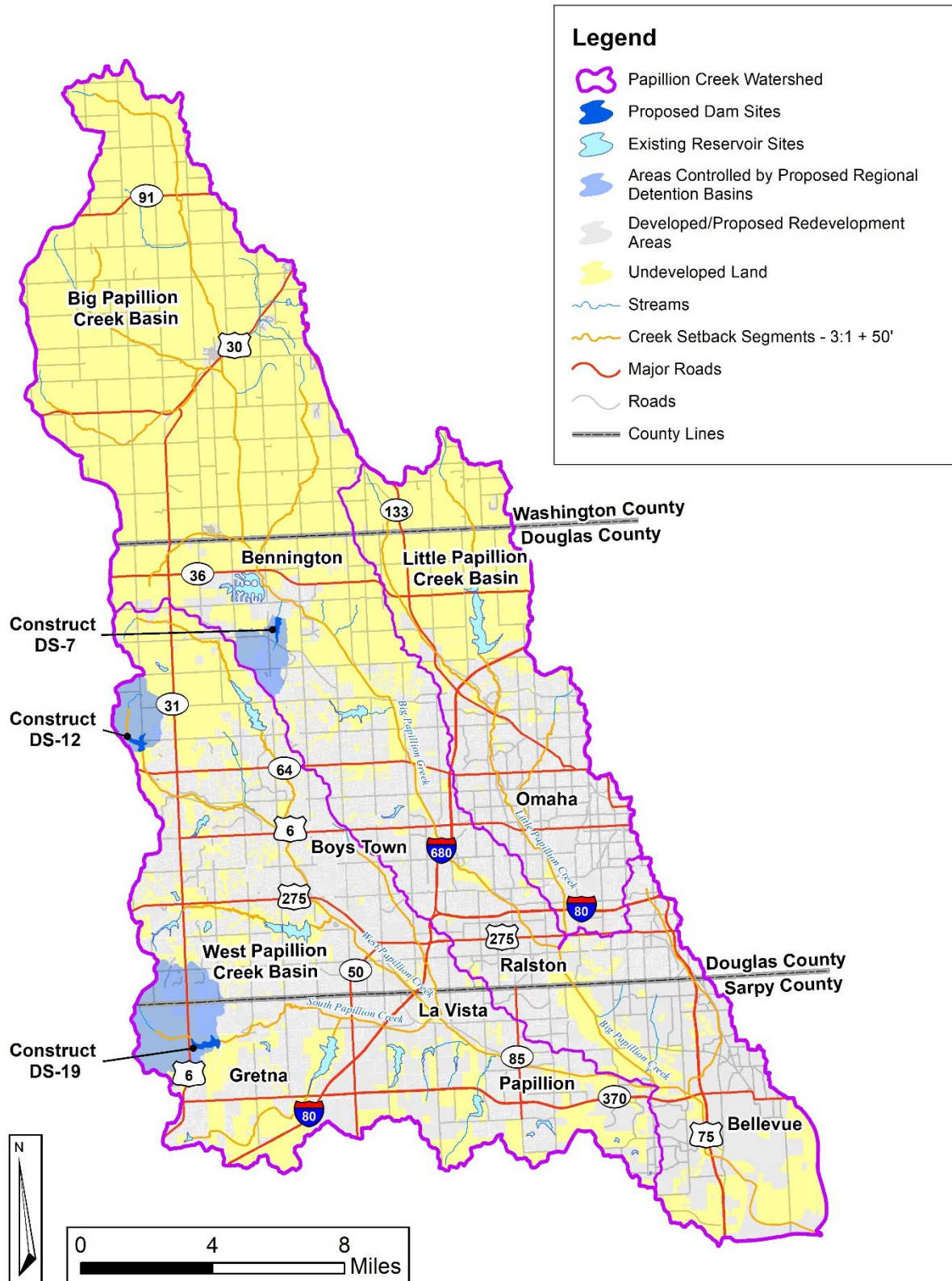
The structural portion of the Implementation Plan update consists of Program Projects whose construction would be initiated in the FY 2025 to FY 2029 planning period. Proposed Program Projects recommended by the PCWP consist of three (3) regional detention basins, as listed in [Table 6](#) and shown on the Implementation Plan Map in [Figure 11](#).

Table 6. Watershed Management Plan Program Projects for FY 2025 to FY 2029

Structure	Approx. Location & Planning Jurisdiction	Drainage Area (acres)	Est. Project Capital Costs, 2018 Basis, \$ Millions
DS-19	192 nd & Giles Road; City of Gretna	2,750	\$37.3
DS-12	216 th & Fort Streets; City of Omaha	1,660	\$30.4
DS-7	168 th and Bennington Road; City of Omaha	1,675	\$27.2
Total			\$94.9

Note:
DS= Dam Site

Figure 11. Papillion Creek Watershed Implementation Plan Map (FY 2025 to FY 2029)



5.2 Project Funding Framework

Project funding considerations every five (5) years need to include a re-examination of financial resources, responsibilities, and constraints that are needed to support the Plan and implementation. The Watershed Fees are reassessed based on total Program costs (updated remaining structural projects plus previous Program Project expenditures), land use/population projections, and a credit for Watershed Fees collected to date. Funding needs will be cost shared with the goal of 2/3 public (tax dollars) and 1/3 private (Watershed Fees) for overall Program Project costs. The Watershed Fee rates increase by an annual inflation factor determined with each plan update. [Table 7](#) below summarizes the adjusted annual Watershed Fee rates with 3 (three) percent inflation per year for the FY 2025 to FY 2029 implementation period.

Table 7. Schedule of Watershed Fees for Years FY 2025 to FY 2029

Fee Category	Current (FY 2024)	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029
Single Family Residential per housing unit or dwelling unit (also includes low-density multi-family up to 4-plexes)	\$1,027	\$1,058	\$1,090	\$1,122	\$1,156	\$1,191
High-Density Multi-Family Residential (beyond 4-plexes) per gross developable acre	\$4,520	\$4,656	\$4,795	\$4,939	\$5,087	\$5,240
Commercial/Industrial per gross developable acre	\$5,478	\$5,642	\$5,812	\$5,986	\$6,166	\$6,351

The PCWP's intent is to monitor market conditions for favorable interest rates that would justify obtaining an additional \$20M bond by December 2024 to finance Program Projects. Additionally, the PCWP will stay informed on potential revisions to CWIFP that would allow new project eligibility for the WIFIA Loan. Obtaining a bond or WIFIA loan at a favorable rate (approximately 3 percent for bonds and 2 percent for WIFIA Loans as modeled) would increase the rate of Program Project implementation and provide valuable costs savings by minimizing inflation incurred. The total cost of regional detention without additional revenue from bonds or loans (Scenario 1.0) was estimated at \$146.8M and would be reduced by approximately \$10.5M to \$12M (Scenarios 2.1 and 3.2) if a bond or WIFIA Loan was obtained at a favorable interest rate.

5.3 Next Steps

During the FY 2025 to FY 2029 planning period, the Partnership will continue to evaluate issues related to flooding and erosion throughout the watershed. Discussions during the plan update questioned the continued use of watershed fees for flood control projects and whether additional Program Projects could be added that addressed other issues such as stream repair projects. As discussed in Section 4 of this report, watershed fees were intended to cover approximately one-third of the Program Project costs. Fees collected as of the date of analysis comprise approximately 14% of expenditures to complete Program Projects.

Stream Stability Evaluation

Concerns with stream degradation and bank erosion have been identified in developed areas by members of the Partnership and were discussed throughout the 2024 Plan Update process. Stream erosion in developed areas is causing damage to public infrastructure (road crossings, utilities, etc.) as well as loss of private property. The magnitude of this problem and how to address it is not fully understood at this time. During the FY 2025 to FY 2029 implementation period, the Partnership will pursue an assessment that includes the efforts described below. The goal of the assessment would be to provide the Partnership with perspective on the order of magnitude of financial resources that would be required to address stream stability with Program Projects.

1. Identify sites with existing stream stability problems within the watershed
 - a. An inventory of existing problem areas will be created using data provided by each Partner, analysis of available datasets, and minor field work.
2. Identify potential Program Projects
 - a. Based on results of the inventory, the Partnership will determine the magnitude of issues that would qualify for investment from the Partnership. This will also include development of a methodology to prioritize sites so that work is equitable throughout the watershed.
3. Perform a cost analysis
 - a. Approximate total cost range for addressing all potential Partnership Projects

Stream Setback Definition

Effort was made during the 2024 Plan Update to modify the stream setback defined under the Stream Corridor Preservation policy group to reduce the risk of damage from stream erosion and degradation that is experienced within the watershed. No conclusions were reached, and the Partnership continue to evaluate stream setback definition alternatives for a policy update. Prevention of future degradation is a key component to reducing costs to repair and restore streams.

6 References

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List of Appendices

Appendix	Description
A	Financial Model Development
B	Current Watershed Management Policies
C	Stakeholder Engagement Synthesis
D	Stream Stability Documentation
