

October 9, 2012

LR 495 Testimony

Chairperson Langemeier and Members of the Natural Resources Committee:

My name is Laurie Carrette Zook, Water Resources Engineer for HDR Engineering Inc., and I want to thank you for the opportunity to provide testimony regarding the Papillion Creek Watershed. HDR was retained by the P-MRNRD and the Papillion Creek Watershed Partnership to study and evaluate flood mitigation measures within the Papillion Creek Watershed. Work began in 2001 with data collection and was completed in 2009 with a document outlining the Papillion Creek Watershed Plan. I plan to provide an overview of the stormwater issues that face the Papillion Creek Watershed and the communities that reside within its boundaries.

Papillion Creek Watershed Partnership (PWCP) Mission

In August 2001, the Papillion Creek Watershed Partnership (PCWP) was created to facilitate compliance with federal mandates. The Environmental Protection Agency required urbanized areas to obtain National Pollutant Discharge Elimination System permits for their stormwater discharges. In order to reduce duplication of programs and reporting, P-MRNRD and the communities, and counties located within the Papillion Creek Watershed banded together with a common mission to:

“Address issues related to water quality and storm water quantity in the Papillion Creek Watershed by establishing regionally common goals and standards for the development of the watershed through 2040.”

What is and who is the PCWP?

PCWP joins communities located within the 402 square mile watershed located in 3 counties: Washington, Douglas and Sarpy.

A total of 9 local governments are represented in the PCWP with the guiding principle of cooperation, participation and comprehensive watershed planning. The logos for the 9 governments are depicted on the bottom of the slide.

Problems are getting worse and time is running out

The Papillion Creek Watershed has a history of flooding. In the late 1960's, the U.S. Army Corps of Engineers proposed a series of 21 regional dams to protect the Omaha metropolitan area. Only 8 dams have been constructed to date. As urbanization continues, the amount of paved roads and rooftops increases, thereby; increasing the amount of runoff coming off our lawns, collecting in our ditches, sewers, creeks, and rivers. Floodplain management, levees, channel and reservoir projects, and conservation measures have proven to provide effective reductions in flooding risk; however, a flooding threat still exists in the Omaha Metropolitan area.

It is estimated that within the next 30 to 50 years, the majority of the land in the Watershed will be developed, as can be seen graphically on the slide. The smaller map shows urban development, in red, in 2002, while the future land use map show what the areas of the

Watershed that would be developed. Existing problems will get worse if appropriate actions are not taken now or continue in the future.

Partnership Recommendations— The Watershed Plan

What was missing was a single, comprehensive Watershed Management Plan. A Plan that provides direction to minimize flooding and improve water quality within the Watershed.

The Watershed Plan recommended by the PCWP, consists of non-structural and structural elements. Each community passed an ordinance requiring low impact development or LID strategies to improve water quality. This ordinance requires all new developments to control the first half inch of runoff on site and a no net-increase in the 2-year peak discharge.

The structural component is the construction of 15 regional detention and 12 water quality basins in Douglas and Sarpy counties. These structures would be located upstream of urbanizing areas and designed to store floodwaters, while the water quality basins would be constructed upstream of regional detention basins to collect sediment and pollutants. Regional detention sites have proven to be an effective flood control measure saving lives and property in the Papillion Creek Watershed.

The next slides are some examples of LID and detention basins.

Examples of LID

Low Impact Development or LID can be effective in improving water quality. LID employs principles such as preserving and recreating natural landscape features, minimizing imperviousness to create functional and appealing site drainage. There are many practices that have been used to adhere to these principles such as bio-retention facilities, wetlands, pervious pavements, rain gardens, and on-site detention. LID principles and practices promote the natural movement of water within a watershed. LID techniques can work in reducing runoff for more frequent events on local drainage sites.

Examples of Regional Detention

Regional detention basins are larger on-site facilities such as dams that regulate or control stormwater from a larger area. These regional detention basins not only provide protection from less frequent events, but also offer recreational benefits to the surrounding communities.

On the left is an example of a regional detention basin and water quality basin. Upstream of Wehrspann Lake is a water quality basin located south of Hwy. 370. Sediment laden water is collected and allowed to settle while cleaner water is released downstream into Wehrspann Lake. On the right is Walnut Creek. Walnut Creek is located in Sarpy County and offers flood control and recreational opportunities for the residents of Papillion and Sarpy County.

Watershed Management Plan Improves Floodplain Boundaries

With the implementation of the Watershed Management Plan, the floodplain boundary decrease. The photos on the left illustrate the 1980's floodplain in green and the 2004 floodplain in blue. The floodplain has increased and numerous businesses and homes are at risk of flooding. The figures on the right illustrate the 2004 floodplain in blue and the floodplain boundary with the implementation of the Plan in orange. As can be seen, the

floodplain shrink, but at some locations, like at 144th and F Streets on the West Papillion Creek, the flooding risk is reduced, but not eliminated.

Benefits of Watershed Management Plan

What are the benefits of the PCWP's Plan?

- Application of water quality controls throughout the Watershed
- Flexible implementation of flood control when and where needed
- Provides proven methods of flood control recognized by FEMA
- Manageable level of structures requiring operation and maintenance
- Maintains development densities and reduce urban sprawl

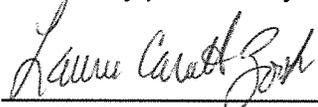
Estimated Costs for Watershed Plan

What is the estimated cost for implementation of the Watershed Plan?

- Water Quality LID funded by development
- Regional detention and water quality basins in Douglas and Sarpy counties funded by public and/ or private partnerships
- \$376 M in 2010 dollars
- \$963 M implemented through 2050

Thank you for listening to my testimony. I would be happy to assist you with any questions on the Papillion Creek Watershed related to LR 495.

Testimony provided by:



Laurie Carrette Zook, P.E.
HDR Engineering, Inc.
8404 Indian Hills Drive
Omaha, NE 68114
(402) 399-1078 laurie.carrette@hdrinc.com

Providing Flood Control for the Papillion Creek Watershed

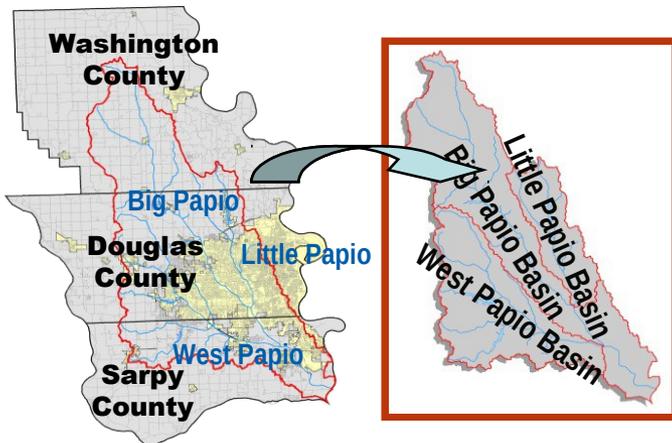
Nebraska Natural Resources Committee
LR 498
October 9, 2012

Laurie Carrette Zook, PE, CFM
HDR Engineering, Inc.



Papillion Creek Watershed Partnership (PWCP) Mission

*“Address issues related to water quality and storm water quantity in the Papillion Creek Watershed by establishing **regionally common goals and standards** for the development of the watershed through 2040.”*



Established August 2001

What is and who is the PCWP?

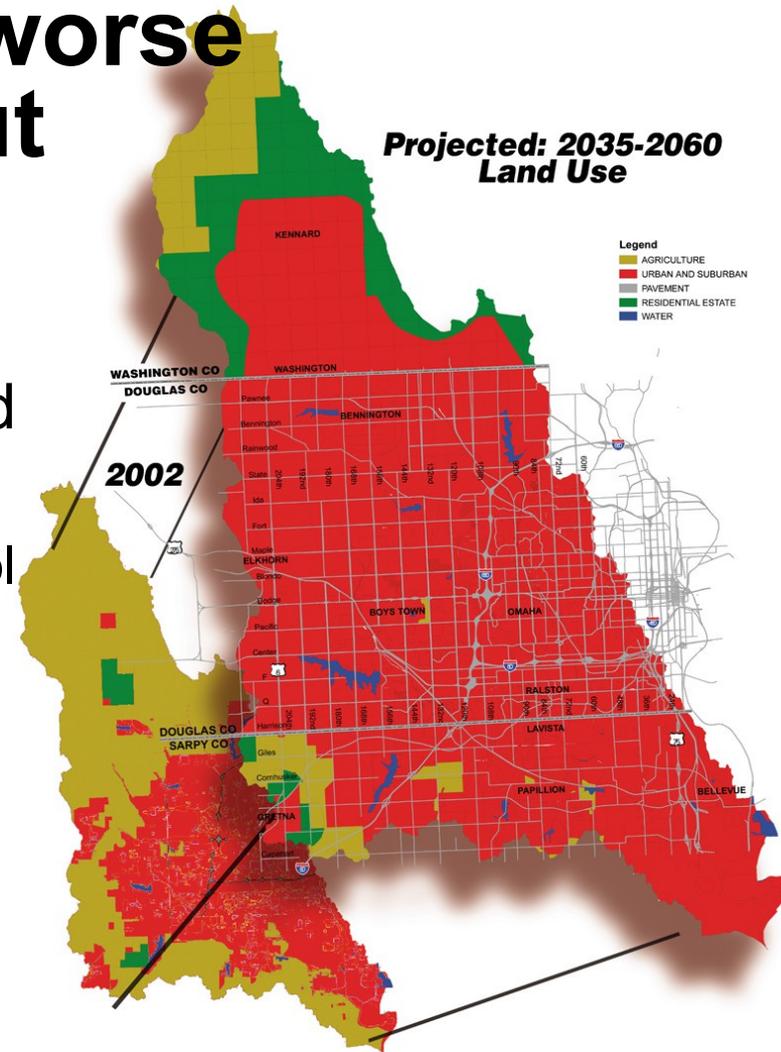
- The Papillion Creek Watershed is a common thread that joins our communities
 - 402 Square Miles - Portions of three counties
 - One third of Nebraska's population
- The PCWP is comprised of 9 local governments that are wholly or partially in the Papillion Creek Watershed
- The guiding principles of the PCWP are cooperation, community participation and comprehensive watershed planning

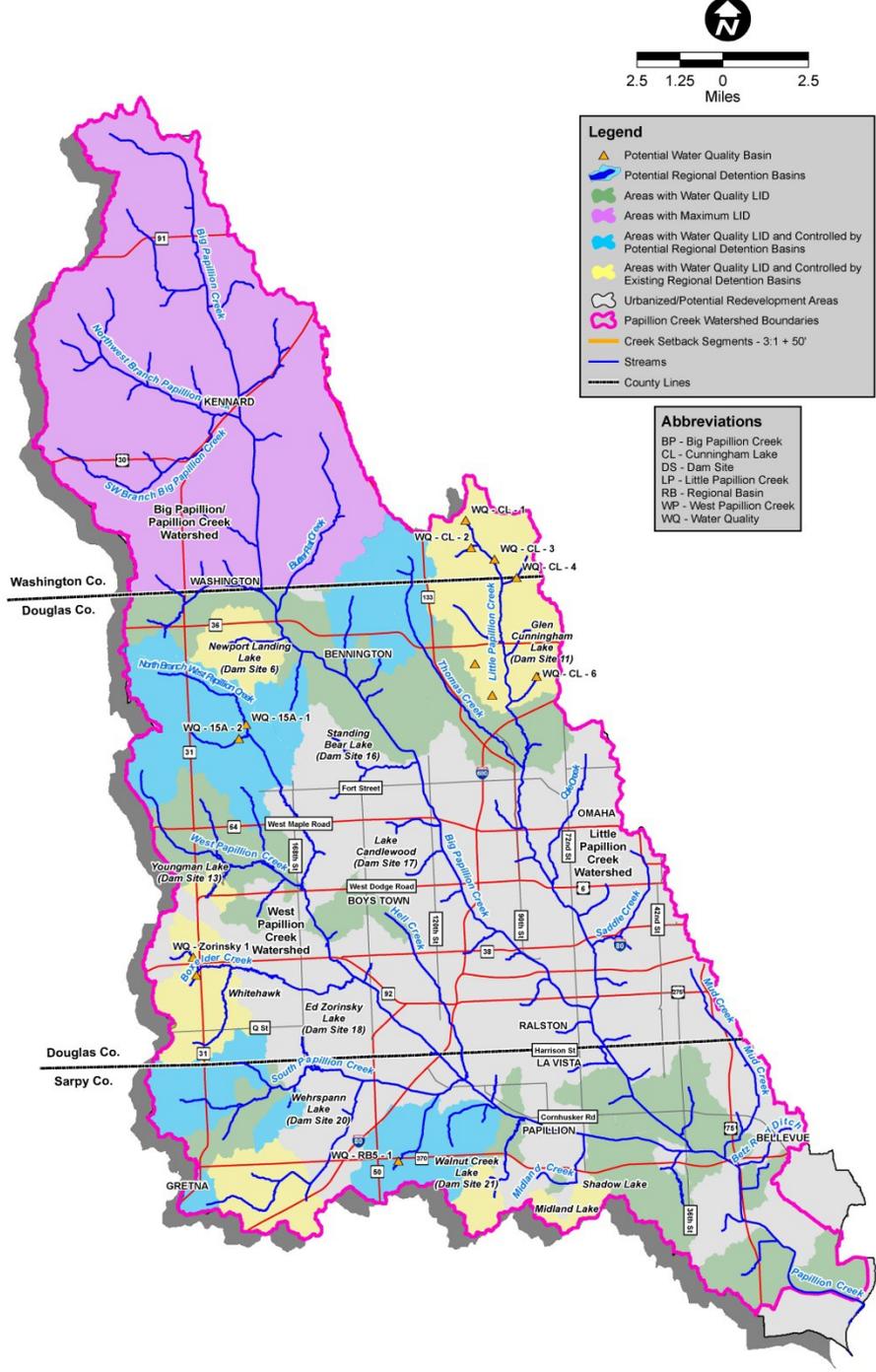


Problems are getting worse and time is running out

Our watershed has limited options,
time and available land for
water quality improvements and
flood prevention

- Current water quality and flood control measures will not meet future needs.
- Continued urban growth has and will lead to larger floodplains, increasing the flood risk to life and property
- Almost all land in the watershed will be developed in the next 30 to 50 years



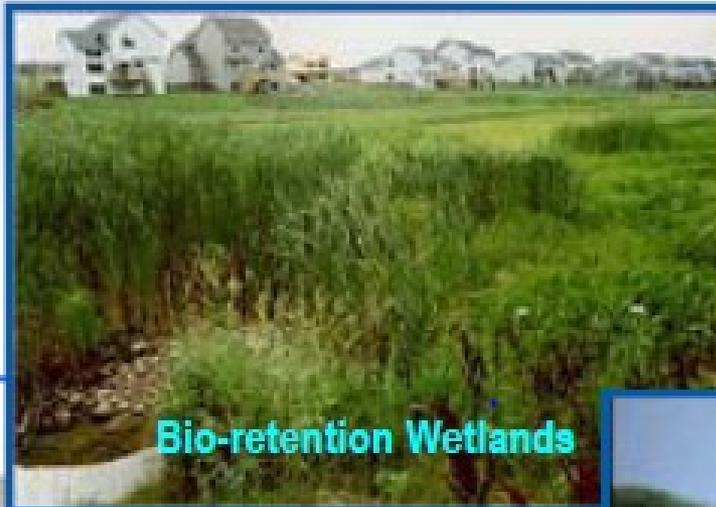


PCWP Recommendations— *The Watershed Plan*

- **Non-Structural Elements**
 - Ordinance passed by communities requiring WQ Low Impact Development (LID) for all new developments
 - Control of 1/2-inch runoff
 - No net increase in 2-year peak discharge

- **Structural Elements**
 - 12 Water Quality Basins
 - 15 regional detention basins in Douglas and Sarpy counties

Examples of LID Retention Strategies



Bio-retention Wetlands



Pervious Concrete
Regency Lodge, Omaha



Rain Garden
National Park Service, Omaha



On-site Detention

Examples of Regional Detention



Watershed Management Plan Improves Floodplain Boundaries

Floodplains have Expanded
With Development

Floodplains will Shrink with
Watershed Management Plan



3
South Papillion
Creek near
NE Hwy. 50



4
West Papillion
Creek near 144th
and F Streets



Legend

- Regulatory FEMA Floodplain Boundary (1980's)
- Existing Floodplain Boundary (2004)
- Watershed Management Plan Floodplain Boundary

Benefits of Watershed Management Plan

- Water quality controls applied throughout Watershed
- Able to address existing flooding problems in a timely fashion
- Proven method of flood control recognized by FEMA
- Manageable level of structures requiring Operation and Maintenance
- Maintain development densities and reduce urban sprawl

Estimated Costs for Watershed Plan

- Water Quality LID funded by development
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