

INTER-OFFICE MEMORANDUM

DATE: October 24, 2023

TO: City Commission

FROM: Bill Heatherman, PE, CFM, Floodplain Administrator/Stormwater Compliance Engineer

RE: Annual Review of the City's Floodplain Management Plans

BACKGROUND

A review of the adopted Floodplain Management Plans has been completed as part of the City's on-going flood hazard mitigation efforts and a requirement of recertification of the City's participation in the Community Rating System. The review covers the flood hazard elements for Manhattan within the regional Hazard Mitigation Plan, as well as more detailed local plans adopted for Wildcat Creek and the Kansas and Blue Rivers.

The Central Kansas (Region I) Multi-Hazard, Multi-Jurisdictional Mitigation Plan was finalized with regional participation in May 2020. This document is used to analyze the potential risks that face the residents and businesses throughout a 7-county region of north-central Kansas, which includes the City of Manhattan and Riley and Pottawatomie Counties. Adoption of the plan is required as a condition for future funding of mitigation projects under multiple FEMA grant programs. The City of Manhattan fully participated in the FEMA-prescribed mitigation planning process for the development of the plan, and the City Commission formally adopted the plan on November 17, 2020, via Resolution No. 111720-A. The full plan can be found on the Riley County Emergency Management website at <https://www.rileycountyks.gov/207/Emergency-Management>.

The Wildcat Creek Floodplain Management Plan culminates the Wildcat Creek Watershed Working Group's efforts. It summarizes the discussions and desired action items for the City of Manhattan and Riley County to minimize flooding impacts on residents, business owners, and their properties. The Floodplain Management Plan was adopted by Ordinance No. 7047 on November 5, 2013, and the Comprehensive Plan was amended to reference the document formally. The Riley County Planning Board and the Riley County Board of County Commissioners undertook the same process. The entire Wildcat Creek Floodplain Management Plan can be found at <https://cityofmnhk.com/2150/Wildcat-Creek-Floodplain-Management-Plan>.

In 2019, the City and Riley County began an update to the Wildcat Creek Floodplain Management Plan. An initial draft was presented at a Joint City-County meeting in March 2021. More work is needed to complete the planning update.

The Big Blue and Kansas Rivers Floodplain Management Plan was the final document for a project sponsored by the U.S. Army Corps of Engineers, the State of Kansas, Riley County, Pottawatomie County, and the City of Manhattan to study how to manage the flood risks for residents and businesses that are outside of the Manhattan Levee System, as well as properties being protected by the City levee system. The City Commission approved Ordinance No. 7270 on January 3, 2017, to adopt the Big Blue and Kansas Rivers Floodplain Management Plan and amended the Manhattan Urban Area Comprehensive Plan to reference the document. The entire Big Blue and Kansas Rivers Floodplain Management Plan is located at <https://cityofmnhk.com/2798/Big-Blue-River-Floodplain-Management-Plan>.

DISCUSSION

This review provides an update of each floodplain management plan or hazard mitigation plan’s action plan.

Regional Hazard Mitigation Plan

The elements of the Regional Hazard Mitigation Plan most relevant to flooding in the city of Manhattan are shown in the following table:

Action Identification	Description	Hazard Addressed	Overall Priority
Manhattan-1	The City of Manhattan is committed to continued participation and compliance with the NFIP.	Flood	High
Manhattan-2	Develop a program to acquire and preserve parcels of land subject to flooding from willing and Voluntary property owners (NFIP)	Flood	High
Manhattan-3	Identify and map flash-flood prone areas and implement flood reduction measures. (NFIP)	Flood	High
Manhattan-4	Develop and implement standards designed to restrict development in natural hazard areas and environmentally sensitive areas, as identified in the Comprehensive Plan.	All Hazards	High
Manhattan-5	Develop and implement standards for open space dedication requirements.	Flood	High
Manhattan-6	The City of Manhattan will complete PM 43 certification of the city levee according to the FEMA Provisionally Accredited Levee agreement.	Dam and Levee Failure	High

The activities largely reflect a continuation of priorities given in the prior regional Hazard Mitigation Plan adopted in 2015. Plans are generally updated on a 5-year cycle. The status of individual elements is as follows:

Participation in the National Flood Insurance Program (NFIP)

The City of Manhattan has participated in the National Flood Insurance Program (NFIP) since 1984. The City continues to participate and be in compliance with NFIP. A new flood insurance study and flood insurance rate maps were completed and adopted by Ordinance No. 7123 on February 3, 2015. The effective date of the flood insurance rate maps is March 16, 2015.

Acquire and Preserve Flood Prone Land

The City has been awarded three separate grants from the Kansas Department of Emergency Management (KDEM) to purchase flood properties. In total, \$2.4 million has been spent (\$1.8 from state and federal funds) to purchase nine (9) properties that removed 20 flood-prone dwelling units from the floodplain. The City will own these properties and remain as open space in perpetuity. One additional grant-funded project is underway, and a second is nearing award. The City continues to work with KDEM and seek other funding sources to buy out properties at risk of flood. The City has routinely set aside funds in the Stormwater Fund to match such grants.

Identify Flash Flood Prone Areas

The City of Manhattan has mapped the flood inundation levels from a flood on Wildcat Creek in 2011 and the September 3, 2018, flood. The City will continue to map flood inundations from significant floods in the future to provide better information to the public and better understand how the City's floodplain functions. One crucial defense against flash flooding risk lies in the adequate design of stormwater infrastructure, including the intentional development of overflow pathways. On October 10, 2023, Public Works issued a major update to the City's Stormwater Management Criteria, which will take effect for designs beginning November 1, 2023. The new criteria supersede previous design standards in effect since 1995.

Development in Natural Hazards and Environmentally Sensitive Areas

The current Manhattan Urban Area Comprehensive Plan identifies environmentally sensitive areas, including the floodways in the city and surrounding areas in rural Riley County. An update of the Manhattan Urban Area Comprehensive Plan was completed and was adopted on April 7, 2015, and mapping these environmentally sensitive areas will continue. In addition, several policies and regulations are in place to protect known wetlands and limit development within the floodplain and floodway.

The Manhattan Development Code (MDC), a major update and consolidation of development and subdivision regulations, was enacted in January 2022. The City's floodplain regulations were incorporated as Article 26-6. In February 2022, modest corrections were made to several provisions of the floodplain section to restore the intent of the 2015 Higher-Standards provisions.

Open Space Dedication

Open space standards are covered by Sec 26-6B-5 of the Manhattan Development Code, which went into effect in January 2022. Under the code, open space is optional if adopted

for purely recreational purposes. Still, it is required as a buffer zone along drainage corridors or within the riparian area along rivers and streams. The dedication requires secure identification of responsible parties and maintenance expectations. On October 10, 2023, Public Works released new Stormwater Management Criteria that expanded technical requirements for sizing and maintenance stream buffers when utilized.

Levee Accreditation and Improvements

This Mitigation Action item was completed on February 8, 2013, when the City of Manhattan received notification from FEMA that the Manhattan Unit Levee accreditation package was accepted. The efforts by the City and its consultant, AMEC Environment & Infrastructure, met the requirements of the PAL agreement.

Additionally, the City has received up to \$40 million in funding from the Federal Government to improve the aging levee system infrastructure, including raising the elevation of the levee to better protect Manhattan residents and businesses. Construction on the Project began in 2022, and the primary phase of upgrades will be completed in 2024. A final phase of work to address the stop-log closure gap at the Union Pacific Railroad Crossing is under design.

Wildcat Creek Floodplain Management Plan

Action Item	City	County	Timeline	Progress
Adopt the Wildcat Creek Floodplain Management Plan (FMP)	X	X	3 months	Complete
Create a City/County Development Coordination Process	X	X	3 months	On-going
Amend the Multi-Jurisdictional Hazard Mitigation Plan to include the FMP		X	6 - 12 months	Complete
Research and, if acceptable, form a Wildcat Creek Watershed District		X	2+ years	Not Started
Develop a comprehensive flood hazard mitigation plan	X	X	2+ years	In Progress
Adopt Future Conditions model and Flood Insurance Rate Maps	X	X	1 year	Complete
Research and adopt higher standard floodplain regulations	X	X	1 year	Complete
Develop a Wildcat Creek recreation plan	X	X	12 - 18 months	Not Started
Develop a comprehensive public outreach plan	X	X	12 months	On-going
Research and update, where needed, development policies and regulations	X	X	12 months	On-going

Adopt stormwater detention/retention policies		X	12 - 18 months	Not Started
Join the Community Rating System	X	X	12 - 18 months	Complete
Maintain and expand the existing flood warning systems	X	X	On-going	On-going

Adopt the Wildcat Creek Floodplain Management Plan (FMP)

As described above, the Wildcat Creek Floodplain Management Plan was adopted and referenced in the Manhattan Urban Area Comprehensive Plan by the Manhattan City Commission on November 5, 2013 (Ordinance No. 7047) and by the Riley County Board of County Commissioners on November 25, 2013 (Resolution No. 112513-73).

Create a City/County Development Coordination Process

This action item has not been formally completed, although the Manhattan Community Development Department and Riley County Planning and Development meet regularly to discuss development topics. Also, the City of Manhattan and Riley County departments that deal with infrastructure and development proposals consistently talk to coordinate efforts, such as utilities, roads, and stormwater management.

Amend the Multi-Jurisdictional Hazard Mitigation Plan to include the FMP

As already noted, this item was completed in 2020.

Develop a comprehensive flood hazard mitigation plan

This action item is underway. As noted previously, the City has been actively mitigating flood-damaged properties by being awarded state and federal grants to mitigate homes in high flood-risk areas.

The City of Manhattan received a grant through the U.S. Army Corps of Engineers (USACE) Floodplain Management Services Program and the Silver Jacket Program to fund the *Little Apple Nonstructural Measures Project*. The Project used national experts from the USACE Nonstructural Flood Proofing Committee and the Institute of Water Resources to analyze a sample of properties in high-risk flood zones to determine what mitigation options are available and what the costs are for these mitigation options. This Project is complete and provides the framework to create a systematic approach for the comprehensive flood hazard mitigation plan.

Furthermore, the City was awarded a technical assistance grant from FEMA to develop a mitigation benefits estimation project. Stantec provided the technical assistance of evaluating over 6,000 homes and businesses in or near a mapped floodplain (floodway, 100-year, and 500-year) to determine if buying out or elevating a structure would be cost-effective. This GIS and cost data is available for both individual projects and potential future comprehensive planning.

Adopt Future Conditions Model and Flood Insurance Rate Maps

The Future Conditions Floodplain Model was completed in 2014 for areas along Wildcat Creek, its tributaries and the Marlatt Drainage Basin, are represented on the updated Riley County Flood Insurance Rate Map (FIRMs) as Zone X (Future Base Flood). The FIRMs went into effect on March 16, 2015.

Research and adopt higher standard floodplain regulations

Higher Standard Floodplain Regulations were drafted and completed in 2014 for the City of Manhattan. The regulations were approved on February 3, 2015. These provisions were carried forward into Article 26 of the Manhattan Development Code, which went into effect in January 2022.

Develop a Wildcat Creek Recreation Plan

The item has not been specifically addressed. The citizens of Manhattan approved a sales tax increase to construct new community recreation centers and provide funds for trails throughout Manhattan. The Manhattan Park and Recreation Department is developing plans for new and improved trails in the city, including providing trails and open space in the Wildcat Creek Watershed, if appropriate.

Develop a comprehensive public outreach plan

The comprehensive plan referenced with the Wildcat Creek study includes floodplain risk messages for the Kansas and Blue River areas as well. Outreach is on-going.

Research and update, where needed development policies and regulations

The City of Manhattan continually researches floodplain and stormwater management policies as needs arise. To date, no new policies or regulations have been proposed beyond what is drafted in the higher standard floodplain regulations.

Join the Community Rating System

The City of Manhattan was accepted into the Community Rating System (CRS) in May 2013 as a Category 8 community, which equates to a 10% discount on flood insurance premiums. In May 2018, the City improved its CRS rating to Category 6, which provides a 20% reduction in flood insurance premiums. Our next revalidation visit is scheduled for November 2023.

Maintain and expand the existing flood warning systems

The Wildcat Creek Silver Jacket Project, created the Wildcat Creek Advanced Hydrologic Prediction Service (AHPS) website and is up and running. This website predicts and graphically represents the water surface elevation of Wildcat Creek during a rain event. This website was used during several significant rain events since its creation, including the September 3, 2018, flood event.

The Wildcat Creek Silver Jacket Project also made installing a roadside flood warning sign and lights possible at the Wildcat Creek Bridge on Scenic Drive. The warning system is fully operational.

Riley County and the City of Manhattan continue to use the multi-media warning system for flood watches and alerts (i.e. storm warnings, street closures, etc).

The City of Manhattan has installed three (3) outdoor sirens with voice modulation along Wildcat Creek. The siren locations are at Amherst Avenue near the Manhattan Fire Station, the 3100 block of Anderson Avenue (City Utility Division Shop), and Anneberg Park. The voice modulation system was used during recent rain events that triggered the need to announce a Flood Warning in the area and performed exceptionally well. These outdoor sirens have helped the City of Manhattan and Riley County emergency officials respond to the event and provide advanced warnings to affected residents. These systems have provided valuable information that can be used for future storm events.

Resilient Wildcat Floodplain Management Plan Update, 2019-on-going

An update to the Wildcat Creek Resiliency Plan was begun in 2019. The effort included multiple meetings of Citizen Advisory Team. Due to staff shortages and the COVID pandemic, progress on the plan paused in 2021. Several draft recommendations and activities progressed, as follows:

- ***2D Hec-Ras Model:*** Wildcat Creeks’ engineered certified HEC-RAS 2D flood model of was prepared to provide the best possible model data to the City, developers, and other consultants. This activity is completed and is in use.
- ***Flood Warning Signs:*** Signs were erected along Anderson Avenue, Scenic Drive, and nearby, with the message “Turn Around, Don’t Drown.”
- ***Detention/Retention Models:*** Two studies of detention/retention for the upper watershed were completed and reviewed with stakeholders prior to 2021. These options included either two large retention basins on Fort Riley or a multitude of smaller retention and detention basins throughout the watershed, basins that could provide multi-purpose benefits to the public and existing landowners. Feedback at the time was mixed on these on these proposals and no further action has been taken.
- ***Tenant Notification.*** A tenant notification requirement was adopted as part of floodplain management regulation updates that took effect in January 2022. Staff intends to work on the implementation of this requirement, including work with landlords, beginning in 2024.

Big Blue and Kansas Rivers Floodplain Management Plan

Action Item	City	Riley County	Pott.Co unty	Timeline	Progress
Adopt the Blue River & Kansas Rivers Floodplain Management Plan (FMP)	X	X	X	3 months	Complete
Create a Development Coordination Process between the 3 Entities	X	X	X	3 months	Not Started
Amend the Multi-Jurisdictional Hazard Mitigation Plan to include the FMP	X	X	X	6 - 12months	Complete

Develop Future Conditions Model and Flood Insurance Rate Maps	X	X	X	2+ years	Not Started
Research and adopt higher standard floodplain regulations		X	X	2+ years	In Progress
Develop Erosion Control and Water Quality Requirements		X	X	1 year	Not Started
Develop Stormwater Detention Requirements		X	X	1 year	Not Started
Maintain and Expand Existing Flood Warning Systems	X	X	X	On-going	Not Started
Develop a Comprehensive Public Outreach Plan	X	X	X	1 Year	On-going
Join the Community Rating System		X	X	12 – 18 months	On-going
Maintain and Expand the Existing Flood Protection Facilities	X	X	X	On-going	On-going

Adopt the Blue River & Kansas Rivers Floodplain Management Plan (FMP)

The City Commission approved Ordinance 7270 on January 3, 2017, to adopt the Big Blue and Kansas Rivers Floodplain Management Plan and amended the Manhattan Urban Area Comprehensive Plan to reference the document.

Create a Development Coordination Process between the three Entities

This goal is similar to that expressed under the Wildcat Creek plan, though to include Pottawatomie County and Zoning officials. Work continues at the staff level to enhance coordination.

Amend the Multi-Jurisdictional Hazard Mitigation Plan to include the FMP

As noted previously, this item was completed in 2020.

Develop Future Conditions model and Flood Insurance Rate Maps

The Future Conditions Floodplain Model was completed in 2014 for the Marlatt Drainage Basin and is represented on the updated Riley County Flood Insurance Rate Map (FIRMs) as Zone X (Future Base Flood). The FIRMs went into effect on March 16, 2015. No other areas within the Blue River Basin or areas in the Kansas River Basin outside of the Wildcat Creek Watershed have future conditions flood models created for it.

Maintain and Expand Existing Flood Warning Systems

Riley County, Pottawatomie County, and the City of Manhattan continue to maintain and operate the emergency warning system installed in early 2000 by the U.S. Army Corps of Engineers during the Tuttle Creek Reservoir stabilization project. This system has a voice-modulated system that was originally created to warn of a reservoir breach during the stabilization project. The system has been expanded to cover all types of warnings,

including flooding. The counties and City continue to use the multi-media warning system for flood watches and warnings as well as other warnings and alerts (i.e. storm warnings, street closures, etc).

Develop a Comprehensive Public Outreach Plan

In the summer of 2014, the City of Manhattan, and New Boston Creative Group, created and implemented a comprehensive effort to address general information about flood risk, flood insurance, floodplain regulations, and the new floodplain maps. on-going project for the City of Manhattan, will be expanded to address other informational needs.

Maintain and Expand the Existing Flood Protection Facilities

As noted previously, the Manhattan Levee system is currently undergoing a significant improvement, the primary phase of which will be completed in 2024.

Flood Preparedness

In addition to the above action items, the City, Riley County, and Pottawatomie County, with the support of the USACE, conducted a tabletop exercise in 2015 with partners in the region to prepare for the event of a massive release from Tuttle Creek Reservoir that would cause flooding along the River and damaging and breaching the Manhattan Levee System. This effort was put into action with the threat of flooding in 2019 due to excessive rain upstream of Tuttle Creek Reservoir, causing the reservoir to nearly reach its capacity and requiring USACE to conduct emergency releases of water from the dam. Fortunately, no evacuations were required in 2019, but the lessons learned from that planning have been documented for future use.

ACTION

The information is provided as a review of the efforts that the City of Manhattan, Riley County, and Pottawatomie County have taken in completing the action items listed in Wildcat Creek Floodplain Management Plan, Big Blue, and Kansas Rivers Floodplain Management Plan, and the regional Hazard Mitigation Plan that is directly related to flooding. The Community Development and Public Works Departments would appreciate any feedback from the City Commission on the efforts made thus far and any suggestions or concerns on the action items yet to be completed. Please direct the feedback, suggestions, or concerns to Bill Heatherman, P.E., CFM, Floodplain Administrator/Stormwater Compliance Engineer.