



2019



FLOODPLAIN
MANAGEMENT
PLAN

PURPOSE

The purpose of the Floodplain Management Plan is to protect the residents of the City by lowering the risks and reducing the effects of disasters on property owners and critical facilities by identifying and implementing mitigation strategies that will reduce or prevent catastrophic damages, casualties, physical and/or financial losses.

Step 1: Organize to Prepare the Plan

The Mayor and City Council saw the need to update the Community Rating System (CRS) program and reduce flood insurance rates for the City and reached out to the former CRS Coordinator to come out of retirement and assist with the project in October 2017. After a few months of working on the CRS program, it was determined that the 20-year old Floodplain Management Plan needed to be updated and incorporated into the current Regional Hazard Mitigation Plan due for revision in early 2019. The City Council formally adopted a Resolution on June 5, 2018 forming the Floodplain Management Committee (FMP) and a Sub-Committee for the Property for Public Information (PPI), including language that the City will add all new and updated information to our current Multi-Jurisdictional Multi-Hazard Plan. On December 18 Council authorized the Floodplain Management Plan (FMP) Committee's proposed revisions to the Regional Multi-Hazard Mitigation Plan (HMP) to be submitted to Forrest County for inclusion in the 5-year renewal of the regional plan due in early 2019. Both documents are attached in Appendix A. It was later determined that the time frame for the HMP would not allow for the two plans to be merged within the CRS Modification timeframe, so in late January, this plan was created separately, with plans to merge before the next CRS annual review.

The Planning Staff of the City of Hattiesburg under the direction of the Floodplain Management Committee prepared this plan. We wish to acknowledge the valuable contributions of the following individuals and the committees:

Mayor and City Council:

Toby Barker, Mayor
Jeffrey George, Ward 1
Deborah Denard Delgado, Ward 2
Carter Carroll, President - Ward 3
Mary Dryden - Ward 4
Nicholas Brown, Ward 5

Planning Staff:

Andrew Ellard, Director of Urban Development
Ginger Maddox Lowrey, Planning Manager/Floodplain Manager
Nick Williams, Planner/CRS Coordinator

CITY OF HATTIESBURG
FLOODPLAIN MANAGEMENT PLAN
JANUARY 2019

Floodplain Management Committee and Property for Public Information Sub-Committee:

Toby Barker, Mayor, Committee Chair
Wilma Adams, Citizen, Floodplain Resident
Michael Anderson, Citizen (Realtor – added for PPI Committee portion only)
Ross Bell, Citizen (Insurance Agent)
Dawn Burns, Staff (Accounting Department)
Deborah Denard Delgado, City Councilwoman, Floodplain Resident (Ward 2)
Chad Edmonson, Citizen
Hema Gopalan and Grand Hobgood, Staff (GIS Department)
Nadir Hasan, Citizen (Twin Forks Development Representative)
Margaret Heath and Judy Mellard, Citizen (Hattiesburg Housing Authority)
Colton Hill, Ronnie Perkins, Maurice Sutton and Keith Parks, Staff (Public Works)
Ann Jones, Staff (Chief Administrative Officer)
Myron Lott, Staff (Parks and Recreations)
Samantha McCain, APR, Staff (Chief Communications Officer/PPI Committee)
Steve Mitchell, Staff (Building Official)
Khadijah Muhammad, Staff/Stakeholder (Municipal Court/Red Cross Representative)
Lisa Reid, Staff/Citizen, Floodplain Resident (Consultant/PPI Committee)
Lamar Rutland, Staff (City Engineer)
Rev. Joseph Scott, Citizen, Floodplain Resident
Paul Sheffield, Stakeholder (Emergency Operations Center)
Hardy Sims, Major, Staff (Police Department, Operations Division)
Paul Sims, Citizen (Insurance Representative on PPI Committee)
James Trussell, Citizen, Floodplain Resident
Melvin Williams, Citizen, Floodplain Resident
Nick Williams, Staff (Planning Department/CRS Coordinator and PPI Committee)
Doug Wimberly, Citizen (Engineer responsible for City's MS-4 Program)
Petra Wingo, Citizen (Twin Forks Development Representative)

The first FMP Committee Public Meeting was held July 5, 2018 for an introduction of team and overview of their purpose and duties (see Table 1-1 for proposed additional meeting dates). Members were given a timeline of proposed meeting dates and topics for each meeting. A binder was issued to each member full of information, guidelines and current ordinances and resolutions, including but not limited to: project timelines and duties for the Committee and the PPI Sub-Committee existing drainage resolution and flood damage prevention ordinance, review of the CRS program, credit points, and what that means to citizens; CRS Manual Activity Series 300 - 600 and acronyms, MEMA's Quick Guide, several FEMA documents on hazard mitigation, excerpts of the Comprehensive Plan. Land Development Code, a history of flooding, and existing maps, such as the areas in a SFHA and previously identified Community Assessed Hazard Areas. We discussed each document to ensure members understood why and what we were doing as a Committee. Public in attendance were not provided a full binder, but were give the timeline of proposed dates:

CITY OF HATTIESBURG
FLOODPLAIN MANAGEMENT PLAN
JANUARY 2019

Table 1 –1, Timeline of Proposed Public Hearings, Floodplain Management Plan 2018

Meeting 2	July 19 th	Assess the Hazard
Meeting 3	August 2 th	Assess the Problem
Meeting 4*	August 16 th	Assess the Problem – continued (if needed) and start Setting Goals
Meeting 5	August 30 th	Setting Goals and start Reviewing Possible Activities
Meeting 6	September 13 th	Review possible activities – continued (if needed) and start Drafting Action Plan
Meeting 7	September 27 th	Draft an action plan – continued (if needed)
Meeting 8*	October 4 th	Initial Review of Draft Plan
Meeting 9*	October 18 th	Final Review of Draft Plan
Meeting 10	date to be determined	Public Hearing
Meeting 11	November 19 th	Adopt the Plan (placed on City Council Agenda by November 9th)
Meeting 12	dates to be determined	Implement, evaluate, and revise

*Several of the above meetings were changed, such as the August 16 meeting which was cancelled to allow the new CRS Coordinator to attend CRS Training, and the October meetings were cancelled to allow staff time to draft the plan. All documentation, such as agendas, sign-in sheets, minutes and copies of each meetings live feed videos are attached as Appendix B.

Step 2. Involve the Public

Plan Process and Public Involvement

The Mayor held Town Meetings with most of the Neighborhood Associations prior to and during the Plan process. Although not held just for the planning process, flood issues were discussed at every meeting, and notes were made of all flood problems reported in each area. The meeting list (Table 2-1) was then incorporated into the planning process and updated as the meetings continued. Full minutes of each meeting are available upon request; however, only the flood related info is included here. The Committee reviewed the list in July and determined these areas needed to be included in the Community Assessed Flood Hazard Maps and the map was updated as new meetings were held in other areas. As noted in the last column of Table 2-1, flooding is an issue across the entire City and not just in the Special Floodplain Hazard Areas.

CITY OF HATTIESBURG
FLOODPLAIN MANAGEMENT PLAN
JANUARY 2019

Table 2 –1, Town Hall Public Hearings, 2017-2018

Meeting Date	Neighborhood Association	Town Hall Meeting Flooding Complaints:
10/19/17	University Heights	<p>Sewer issues on 40th Ave.</p> <p>Water flows over the road on the 400 block of S 3th Avenue</p> <p>Other listed streets with “water problems”</p> <p>Flood insurance has gone up 30% in the last 2 years.</p> <p>Homes flooding on 300 & 400 blk of S 32nd, from Corner Market south</p>
11/13/17	Highlands	<p>Drainage problems due to ditch maintenance/drain issues listed on various streets but no specific mention of high water.</p>
01/25/18	Grace Avenue and North Hills Drive	<p>Drainage problems due to ditch maintenance/drain issues listed on various streets but no specific mention of high water.</p>
02/13/18	Mobile – Bouie	<p>There needs to be a way for water to flow on JD Randolph from 6th to 7th</p> <p>6th Street Community Center looking South: problems with flooding and standing water.</p> <p>Scott Street experiences water backing into people’s yards when it rains.</p> <p>Standing water on the 9th Street ballpark after it rains</p> <p>Flooding behind Butler, 9th and 10th Street where Delk Tire is located.</p> <p>Families relocating due to storms and flooding.</p>
02/15/18	Timberton Property Owners	<p>Drainage problems due to ditch maintenance/drain issues listed on various streets but no specific mention of high water.</p>
03/01/18	Timberton Park	<p>Drainage problems due to ditch maintenance/drain issues listed on various streets but no specific mention of high water.</p>
03/26/18	Unified	<p>The dead end on Willis Avenue floods.</p> <p>John and Katie floods after rain.</p> <p>602 Stevens water rises into the yard while raining.</p> <p>Cypress and Peyton experience flooding issues.</p> <p>Water backs up and fills yard at 915 Franklin.</p>
04/10/18	Jamestown Lincoln	<p>Flooding on Dovercliff</p> <p>Flooding south of Lincoln</p> <p>Flooding at Navajo Circle</p> <p>Flooding at Berkshire/40th</p>
04/17/18	The Oaks	<p>Drainage problems due to ditch maintenance/drain issues listed on various streets but no specific mention of high water.</p>
04/17/18	Irene Chapel	<p>Drainage problems due to ditch maintenance/drain issues listed on various streets but no specific mention of high water.</p>
04/23/18	Longleaf Heights	<p>Some yard flooding at 204 North 20th</p> <p>Flooding on 21st with standing water.</p>
05/03/18	Arcadia Sunset	<p>East end of Sunset Drive experiences flooding into yards when it</p>

CITY OF HATTIESBURG
FLOODPLAIN MANAGEMENT PLAN
JANUARY 2019

		<p>rains. Gordon's Creek floods due to clogging. Clayton and Marie Flood insurance rates have jumped very high.</p>
05/14/18	Pinehills	<p>Dam built on Gordon's creek is causing standing water and mosquito increase. Erosion due to flooding at 105 Shady Lane from the back of Cascades</p>
05/17/18	Audubon Westwood	<p>High water during rain on Fuller Street onto the 1900 and 2000 blocks. Floods with hard rain on South 21st</p>
05/17/18	Innswood	<p>Gordon's Creek road does not drain well. No real specific mention of flooding.</p>
06/04/18	Southern Heights	<p>no reports of water/flooding one bad ditch at 116 Southern Hills</p>
06/11/18	East Jerusalem	<p>Drainage 602 Tipton near the sidewalk 417 Fredrick 1009 Deason 613 Annie 625 McComb 1407 Rebecca, huge flooding Sullivan Street near James Street Behind 1405 Elizabeth (creek around it by Klondike near Rebecca) 1401 Putnam Behind Putnam and Paul there is a ditch, there is a huge tree that has fallen over</p>
07/11/18	Hattiesburg High School	<p>Ditch, between Duane and Myrtle - Needs to be cleaned/fixed/drained Blocked grate/ditch at Hutchinson 300 Broad Drive; Drainage and flooding</p>
07/23/18	Kamper Avenues	<p>Sewage/Water 1712 Camp - overflow SSO 410 South 15th - constant leak 211 South 15th - heavy water leak 403 South 12th and Mamie - water coming up out of the street Drainage 200 and 400 block of 12th - only on the outer areas, those in the middle don't really have an issue All of the homes from 13th overflow back to 12th Avenue, the drains on 13th are higher than the yards so it floods (Colton in Public Works will get after) 12th and Hardy (across from Compadres) 13th and Concart (Colton from Public Works explained roots and total replacement)</p>

CITY OF HATTIESBURG
FLOODPLAIN MANAGEMENT PLAN
JANUARY 2019

		<p>Corner of Camp and Hutchinson (all flooding due to mattresses and garbage) **offenders live at 303 S 13th**</p> <p>214 South 14th</p> <p>295 South 14th</p> <p>303 South 14th</p> <p>213 South 14th</p> <p>422 South 15th</p> <p>100 block of South 15th - sewer line eroding?</p> <p>Basically all of 15th</p> <p>308/310 South 15th</p> <p>Alleys between S 16th and S 17th (Concart/Camp) flood</p> <p>Alley between Camp and Mamie</p>
07/31/18	Palmers Crossing	<p>Drainage</p> <p>Old Airport Road</p> <p>Eleanor Knight</p> <p>South Washington</p> <p>Malcolm</p> <p>North Washington</p> <p>Tatum Road</p> <p>Gassaway Loop</p> <p>Langston Road (by the Jordan's home)</p> <p>Hood Road</p> <p>Willis Road</p> <p>Ditches and Culverts</p> <p>All ditches/culverts used to be cleaned out on a regular basis and now they are not done unless called</p> <p>There is a Wood Mill, likely contaminated, that floods onto Hood Road</p>
08/13/18	North Main Historic	<p>Drainage</p> <p>Melrose and Jackson</p> <p>105 Columbia and Main</p> <p>Main and 6th</p>
08/27/18	Baywood Cove	<p>this neighborhood is one of the natural springs/start of Gordon Creek; only in times of huge storms are there reports of flooding</p>
09/20/18	Kensington Woods	<p>Drainage</p> <p>204 Chesterfield (has not been maintained in many years; the ditch and retaining wall is beginning to erode)</p> <p>On South 40th from Manchester to Kensington (west side of road) the ditch is maintained, but during big rains it floods and there is a SSO</p> <p>Storm water comes under 59 from 302 to 300 Kensington and overflows during floods; produces foul odor</p> <p>Flooding at 40th and Mamie</p>

CITY OF HATTIESBURG
FLOODPLAIN MANAGEMENT PLAN
JANUARY 2019

11/01/18	Midway	214 Gamble Rd, occasional erosion with dirt/clay washing away standing water on Mixon
11/06/18	40th Place	no issues
11/08/18	Briarfield Apartments	drainage and flooding in the middle of the complex
11/13/18	Bethune/Rowan	Standing water on the 100-200 block of Eastside
11/26/18	Hope Drive	no flood issues

On July 19, 2018 the CRS Coordinator met with the Council of Neighbors to explain the upcoming Floodplain Management process and how each Neighborhood Association could participate in the planning process. The Council made up of representatives from each Neighborhood Association, typically the President and Vice President, meet quarterly to obtain and disseminate information back to their Associations on all City issues, concerns and upcoming projects. Members were given a questionnaire for distribution to each of their Associations.

The questionnaire was also distributed by FMP Committee Members and posted on the City's website. Copies of completed questionnaires are attached as Appendix C, and a map of the Neighborhood Associations is shown in Map 2-1.

As shown in Appendix A, live feed of each public meeting outlined in Table 1-1 were done and streamed on our Facebook page. The July 5 organizational meeting fully explained the planning process and solicited input from our citizens.

Currently Used Tools

The FMP Committee utilized the following documents to review existing regulations and preventive activities currently in place (excerpts of which were provided in their Committee Binders):

- Hattiesburg's Comprehensive Plan,
- Land Development Code (which includes the City's Zoning, Subdivision and Stormwater Ordinances),
- Floodplain Damage Prevention Ordinance,
- Disaster Preparedness Plans,
- Metropolitan Planning Organization Transportation Plan,
- ICC Series of Building Code,
- City's Code of Ordinances, which is a codified version of many other adopted Ordinances, and
- Various Drainage Improvement Studies on file.

CITY OF HATTIESBURG
FLOODPLAIN MANAGEMENT PLAN
JANUARY 2019

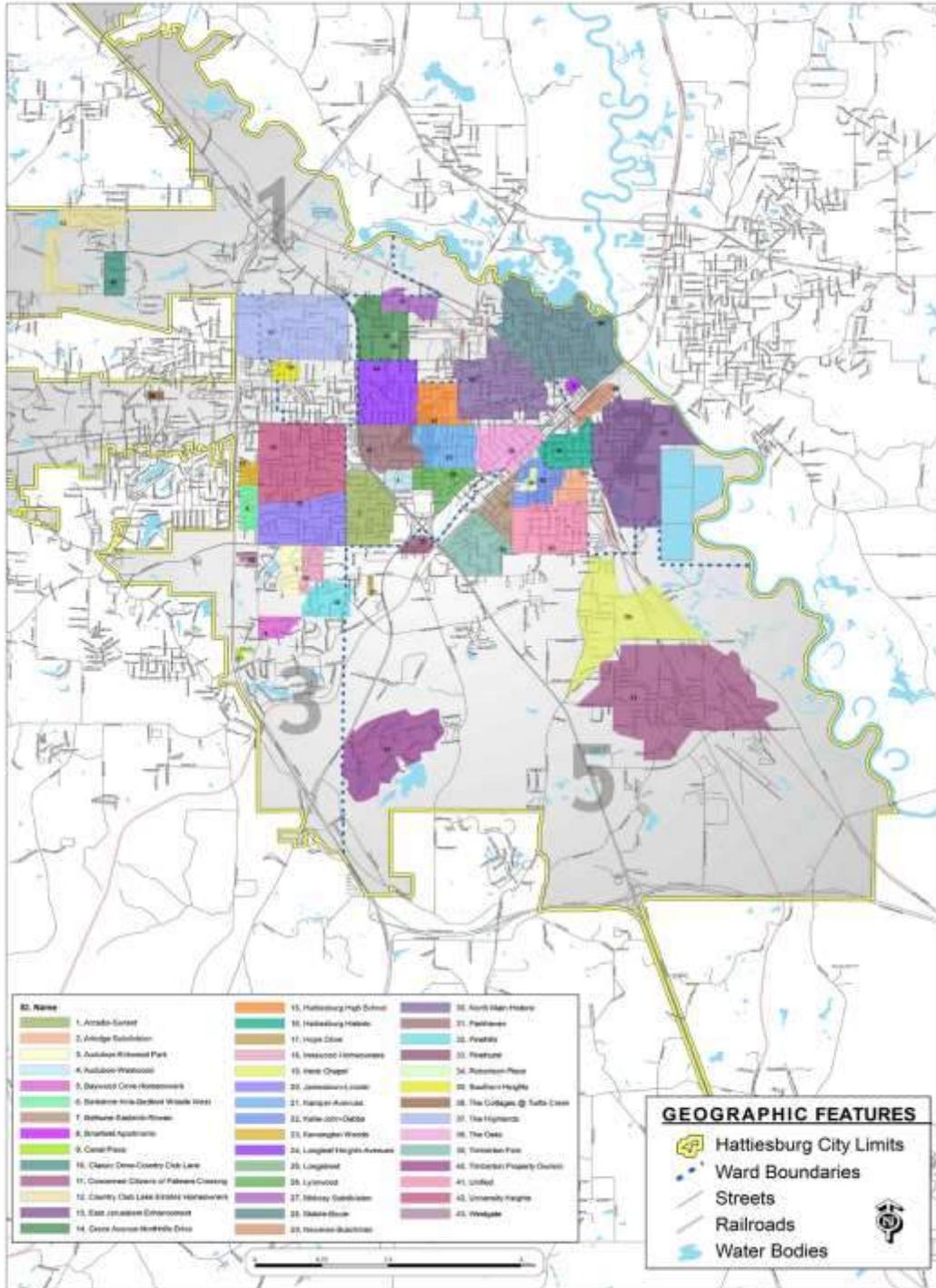
The draft plan and full modification application were presented to the FMP Committee on November 15th for committee and public input. This meeting was open to the public and advertised on our website, notice to Neighborhood Associations and on Facebook. Final revisions were made, and the draft plan and application were placed on the Council's work session agenda on November 19th. The work session is also open to the public and allowed the Mayor to present the modification and FMP to the Council in full to discuss any questions and/or concerns they may have on the proposed documents and goals. Notes were taken for proposed changes recommended by Council and the final draft of the application and FMP will be submitted for final approval on March 5, 2019, which will provide for another work session prior to final review and adoption.

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CITY OF HATTIESBURG
 FLOODPLAIN MANAGEMENT PLAN
 JANUARY 2019

Map 2 –1, Neighborhood Associations Map

HATTIESBURG NEIGHBORHOOD ASSOCIATIONS WITH WARDS



This map is unofficial and is subject to verification. It is not intended for use specific review. It does not necessarily reflect the most current changes and was created for general planning purposes only.



Map provided by the GIS Division of the Hattiesburg Metropolitan Planning Organization, Department of Federal & State Programs, City of Hattiesburg, Mississippi.

Step 3. Coordinate

The Committee reviewed many existing studies and technical information, considering the needs, plans and goals for our City. We looked at many issues, including, but not limited to, past flood studies, disaster and repetitive loss damage reports, how we could better protect our natural resources, etc. We contacted many agencies for information or data they may have on previous projects or ones planned on such things as street or bridge replacements, creek or bank stabilization projects, or any other project that may affect flooding in our City and gained input from different segments of the community that included citizens, public officials, stakeholders and other interested groups.

The Agencies Contacted and a brief description of topics are as follows:

- **American Red Cross** – *met with as to Shelter Management, especially for disabled, and obtained copies of Stakeholder documents*
- **American Disability Act**- *we were directed to their website to obtain their stakeholder information*
- **Area Development Partnership** – *phone call regarding Blueway Info and directed to their website to obtain stakeholder information*
- **Busby Outdoor** – *phone call regarding continued use of billboards for safety messages*
- **City of Ocala, Florida** – *phone call and E-Mails with Maxine Moore, discussed their “lessons learned” in dropping 3 class ratings in 1 modification application*
- **Comcast Cable** – *phone call on Weather Channel info and how disseminated*
- **Cooperative Energy (formerly South MS Electric PA)** - *we were directed to their website to obtain their stakeholder information*
- **DK Carlton & Associates, PLLC**- *phone calls and E-Mails with Dave Carlton, PE CFM, on assistance obtaining sample plans*
- **Emergency Management District**
 - *spoke with Glen Moore and Paul Sheffield in a meeting in their offices on multiple topics on March 18th (meeting notes available), and*
 - *additional meetings with Paul Sheffield on information required in Activity 610 (meeting notes available)*

CITY OF HATTIESBURG
FLOODPLAIN MANAGEMENT PLAN
JANUARY 2019

- **EnerGov** – *phone calls and E-Mails with technician for Software changes for Site Plan and Building Permit programs to document public retention facilities, elevation certificates and other needed documentation for better CRS records management*
- **FEMA** – *website samples obtained, and research conducted on various proposed projects*
- **Forrest County Planning** – *met multiple times with Corey Proctor, Planner, on multiple topics including HMP Plan (meeting notes available)*
- **Forrest General Hospital** - *(only critical facility in town with its own Storm Ready Supporter Designation); we were directed to their website to obtain their stakeholder information*
- **Hattiesburg American, Hub City Spokes and other media sources** – *media attended multiple meetings and reported on the kick-off and the draft plan public hearings*
- **Hattiesburg Area Association of REALTORS® , Inc.** – *phone calls and E-Mails with Trudy H. Bounds, Chief Executive Officer, and her assistant, to document realtor’s disclosure efforts, inquired about possibility of changing their process for better disclosure efforts, and distributing brochure notifying potential buyers of flood insurance need*
- **Hattiesburg Council of Neighborhoods** – *Nick Williams, CRS Coordinator spoke with Council of Neighborhoods in summer of 2018 and later distributed FMP Questionnaire to the Neighborhood Groups for their input.*
- **Hattiesburg Public Library** – *phone calls and E-Mails with Sean Ferrell to ensure their card catalog was up-to-date as to required and locally pertinent documents. He updated and re-classified some items for easier search of flood related documents.*
- **ISO/CRS Technical Coordinator, ISO Community Hazard Mitigation** – *phone calls and E-Mails with Jonathan Smith and Dave Arkens, CFM, to get template and advice on completing Activity 370*
- **Lamar County EOC**
 - *phone calls and E-Mails with James Smith, Director, for assistance on completing information for Activity 610*
 - *phone calls and E-Mails with Freda Rocker, 911 Coordinator to obtain a list of vacant city / state owned properties*

- **Lamar County Planning Office** – *phone calls and E-Mails with Tara Coggins, CRS Coordinator as to the County’s watershed regulations and other activities they do that affect City*

- **MDEQ**
 - *Phone call with Steve Champlin, RPG, Director, Geospatial Resources Division/Flood Mapping regarding the Discovery Phase of Risk MAP for the Lower Leaf Watershed;*
 - *Multiple phone calls and E-Mails with Dusty Myers, P.E., Chief, Dam Safety Division, first to verify State Program was in full compliance, then conversations evolved into his input on new regulations that City wanted to implement regarding protecting citizens in Dam Inundation Areas and ultimately lead to regulations requiring State/Federal Permits for any alteration or change of a watercourse*

- **MDOT**
 - *spoke with Pam Bradley regarding proposed projects, referred us to Keith Steele, Building Construction Division, and Paul Purvis, Bridge Division;*
 - *also spoke with Joy Lines regarding Stakeholder documents.*

- **MEMA** – *numerous phone call and E-Mail conversations with Stacey D. Ricks, CFM, State NFIP Coordinator and George Humphrey, Grants Bureau Director, for PDM and FMA Assistance.*

- **MS Department of Wildlife, Fisheries, and Parks** – *numerous phone calls and E-Mails with Kathy Shelton, South Mississippi Conservation Program, Museum of Natural Science, regarding assistance with the development of a Natural Beneficial Functions Plan*

- **Mississippi Power Company** *we were directed to their website to obtain their stakeholder information*

- **Mississippi State Auditor** – *Committee member Ann Jones spoke to Thomas S. Chain, Director, Technical Assistance regarding possible authority for a municipality to offer a tax abatement for property taxes based on the cost of flood insurance.*

- **Mississippi State Board of Contractors-** *we were directed to their website to obtain their stakeholder information*

- **Mississippi State Rating Bureau** – *phone calls and E-Mails with Ty Windham, Public Protection Division, to obtain City’s BCEGS Rating*
- **National Weather Service**
 - *spoke with Marty Pope, Service Hydrologist, as to information for Activity 610 and getting on NWS mailing list for monthly rain and depth data for better records maintenance of flooding events;*
 - *also spoke with Felecia Bowser, Warning Coordination Meteorologist as to the expiration October 31, 2018 of our Storm Ready designation and the re-certification process. Application has been submitted for renewal*
- **Natural Resource Conservation Service (NRCS)** –*spoke with Norman Patterson inquiring as to completed / proposed projects performed in the City; any input they would have on a Watershed Plan or Natural Beneficial Functions Plan*
- **Neighborhood Associations** – *questionnaires were completed by many members*
- **Neel-Schaffer Engineering**
 - *met with Doug Wimberly as to the many projects they do for the City and the management of our MS-4 program - multiple meetings – Stormwater, Watershed, open space, natural beneficial functions (meeting notes and E-Mails available)*
 - *Phone calls and E-Mails with Rus Bryan on Blueway Project*
- **Pearl River Valley EPA** - *we were directed to their website to obtain their stakeholder information*
- **Salvation Army** - *we were directed to their website to obtain their stakeholder information*
- **Shows, Dearman and Waites Engineering Progress**
 - *meet with John Weeks and Nick Connerly in their offices regarding how any of the multiple projects they handle affect the City’s flooding; they are the County’s Engineer and perform all bridge inspections for all of Forrest County including the City, under the National Bridge Inspection Program; and multiple other topics were also discussed. (meeting notes and E-Mails available)*
 - *Phone calls and E-mails with Kyle Wallace, P.E., Project Engineer, also took place regarding a recent Corrinne Street Drainage Study*
- **State Board of Realtors** – *phone calls and E-Mails with Ron Farris, Attorney (changing state rules as to disclosure)*

- **U. S Corps of Engineers** – *tried to inquire as to completed / proposed projects they have performed in the City; any input they would have on a Watershed Plan or Natural Beneficial Functions Plan (several phone calls and E-mails remain unanswered)*
- **U.S. Department of Housing and Urban Development (HUD) Housing Counseling Program Army** - *we were directed to their website to obtain their stakeholder information*
- **United Way of Southeast MS** - *we were directed to their website to obtain their information*

4. Assess the Hazards

Our Mayor served as Chair of the Committee, and a Council Woman served as a member. Our governing body is very proactive with the Flood Program and other City Council members stayed in contact and requested status reports throughout the meeting process.

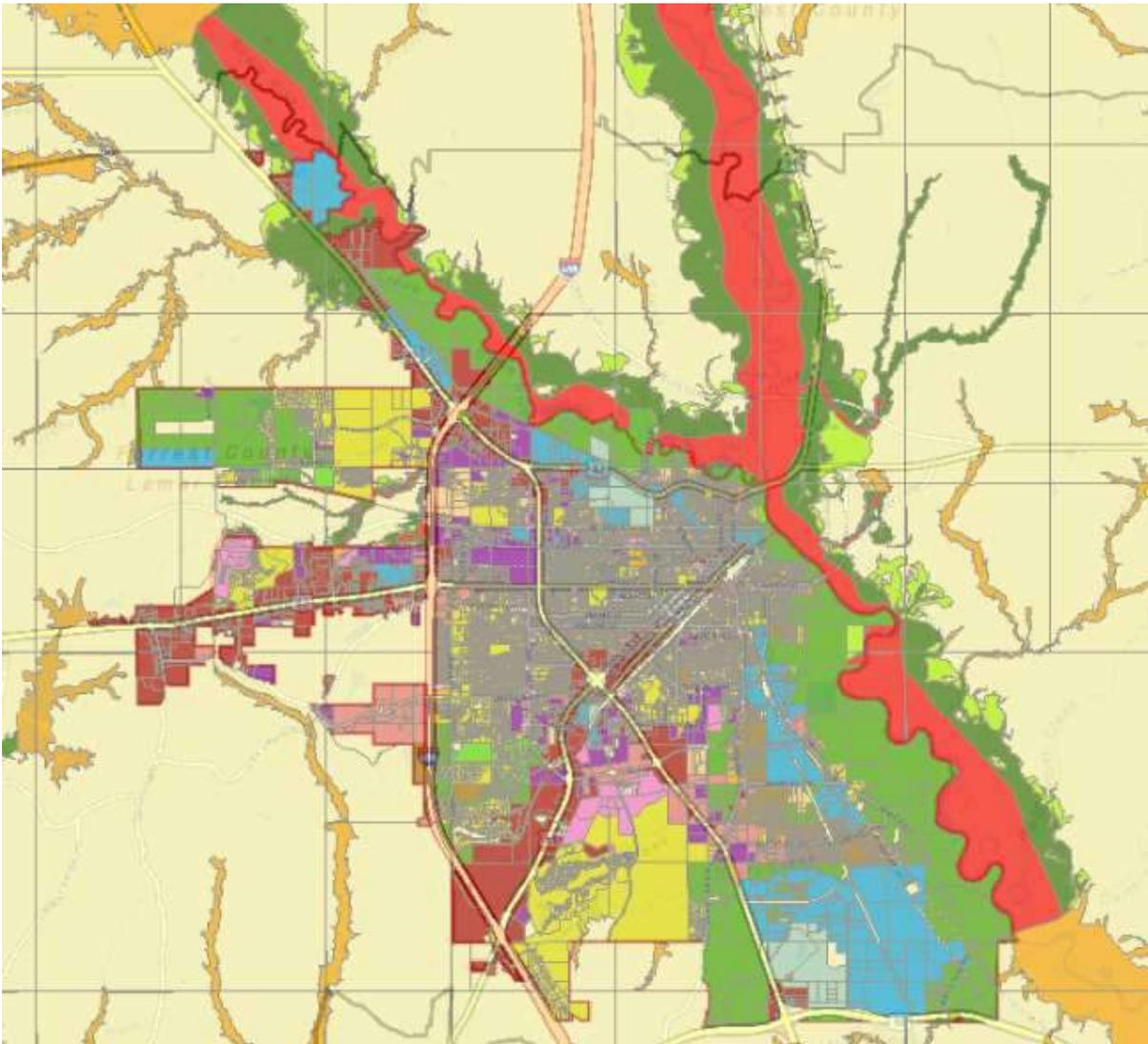
On July 19, 2018 we started digging in; with a public meeting to discuss and identify the different types of flooding hazards in the City of Hattiesburg. There were several attendees from the public who also contributed to the conversations and provided their own list of problem areas that were not previously identified by the Committee.

The City of Hattiesburg has low, medium and high density residential and commercial land uses. The higher density developments are generally along major arterials and the lower density residential and commercial land uses are along local and collector arterials. As shown in Map 2-1, Neighborhood associations are located throughout Hattiesburg. Agricultural land use is located along the floodplain properties on the east part of the City. Industrial land use is mostly located in the Industrial Park in the southern area of the City and in some portions adjacent to the agricultural land along the east side of Hattiesburg. The majority of regional commercial zoning is along major transportation corridors.

Map 4-1 shows the City's existing zoning by type, especially as it relates to the SFHA, and Figure 4-1 shows the acreage of each zone type in the City and the percent of all land in the SFHA..

CITY OF HATTIESBURG
 FLOODPLAIN MANAGEMENT PLAN
 JANUARY 2019

Map 4- 1 – City Zoning and SFHA Layer



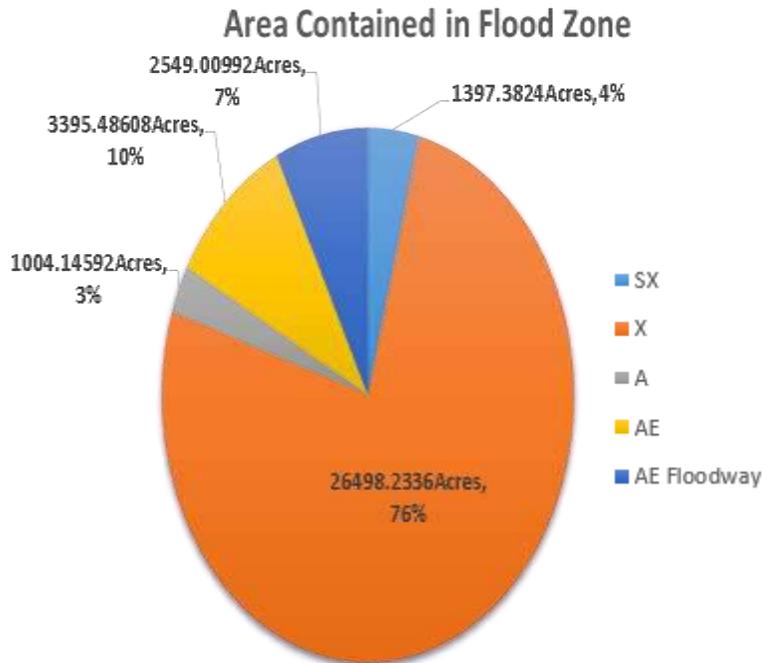
<all other values>	R-1A	EM-4	FEMA Flood Zones FLOODWAY AREA IN ZONE AE ZONE A (100 yr flood - no elevation) ZONE AE (100 yr flood w / elevation) ZONE SX (500 yr flood) ZONE X (No Special Flood Hazard Area)
A-1	R-1B	EM-6	
A-2	R-1C	EM-9	
B-1	OS	<Null>	
B-2	RA-3		
B-3	RD-2		
B-4	MX-3		
B-5	MX-4		
I-1	MX-4-HS		
I-2	MX-5		
R-2	MX-5-HS		
R-3	EM-2		
	EM-3		

CITY OF HATTIESBURG
FLOODPLAIN MANAGEMENT PLAN
JANUARY 2019

Figure 4.1 City Acreage By Zoning

Zone A			Zone AE			Zone AE Floodway		
Zoning	Zoning Count	Acreage	Zoning	Zoning Count	Acreage	Zoning	Zoning Count	Acreage
A-1	43	264.21	Unidentified	84	61.61	Unidentified	36	53.05
A-2	1	0.19	A-1	47	1136.27	A-1	106	1839.14
B-2	22	7.74	A-2	17	42.09	A-2	7	3.88
B-3	12	64.51	B-1	46	10.11	B-1	16	2.52
B-5	16	73.90	B-2	97	22.66	B-2	13	5.73
I-1	52	96.01	B-3	255	121.23	B-3	53	21.50
R-1A	50	335.56	B-4	74	9.20	B-4	18	3.26
R-1B	6	23.77	B-5	282	433.67	B-5	64	184.05
R-1C	37	3.37	EM-2	12	3.35	I-1	4	194.14
R-2	4	34.45	EM-3	22	12.28	I-2	1	2.90
R-3	14	32.94	EM-6	5	1.03	R-1A	210	71.69
			EM-9	3	3.80	R-1B	86	16.44
			I-1	115	301.54	R-1C	78	9.15
			I-2	5	35.38	R-2	3	1.23
			OS	4	0.29	R-3	28	30.53
			R-1A	876	340.07			
			R-1B	444	101.36			
			R-1C	1625	213.51			
			R-2	55	26.48			
			R-3	77	72.08			
Totals:	272	953.03	Totals:	4245	2948.03	Totals:	723	2439.22

Zone SX		
Zoning	Zoning Count	Acreage
Unidentified	42	70.65
A-1	64	521.99
A-2	7	7.51
B-1	51	8.16
B-2	58	10.95
B-3	142	41.07
B-4	59	5.38
B-5	263	126.88
I-1	197	182.48
I-2	5	51.29
R-1A	509	101.05
R-1B	235	31.22
R-1C	461	35.88
R-2	15	3.00
R-3	64	28.85
Totals:	2172	1226.35



CITY OF HATTIESBURG
FLOODPLAIN MANAGEMENT PLAN
JANUARY 2019

Figure 4.1 City Acreage By Zoning – continued; Zoning Legend and Percent of Lands in SFHA

Zone X		
Zoning	Zoning Count	Acreage
Unidentified	93	829.93
A-1	139	3262.20
A-2	76	325.54
B-1	279	202.25
B-2	403	308.09
B-3	489	1366.75
B-4	80	28.71
B-5	687	3476.93
EM-2	4	3.14
EM-3	4	16.92
EM-4	1	8.12
EM-6	2	6.24
EM-9	1	10.81
I-1	152	2803.47
I-2	14	621.32
MX-3	17	11.55
MX-4	43	25.23
MX-5	1	1.98
OS	2	3.59
R-1A	4697	5581.37
R-1B	1707	718.89
R-1C	2187	1204.07
R-2	266	634.09
R-3	577	1534.78
RA-3	19	7.85
RD-2	3	4.39
Totals:	11943	22998.22

Zoning Legend	
A-1	Agriculture
A-2	Agriculture Residential
B-1	Professional Business
B-2	Neighborhood Business
B-3	Community Business
B-4	Downtown District
B-5	Regional Business
EM-2	Employment 2-Story
EM-3	Employment 3-Story
EM-4	Employment 4-Story
EM-6	Employment 6-Story
EM-9	Employment 9-Story
I-1	Light Industrial
I-2	Heavy Industrial
MX-3	Mixed Use 3-Story
MX-4	Mixed Use 4-Story
MX-5	Mixed Use 5-Story
OS	Open Space
R-1A	Single Family Residential
R-1B	Single Family Residential
R-1C	Single Family Residential
R-2	Two Family Residential
R-3	Multi-Family Residential
R-4	
RA-3	Attached 3-Story
RD-2	Detached 2-Story
SC	
HS	Hardy Street Overlay

Total Acreage / Percent of All Lands in the City of Hattiesburg	
Graphs	Approximate Acreage/ Percentage
Acreage of land in all zones, including SFHA	34,844
Acreage of all land in the regulated SFHA (A, AE and Floodway)	6,949
Percentage of all land in the regulated SFHA (A, AE and Floodway)	20%

CITY OF HATTIESBURG
FLOODPLAIN MANAGEMENT PLAN
JANUARY 2019

The Committee looked at the City as a whole, not just the Special Flood Hazard Area as the City is prone to flash and street flooding, causing many of our Repetitive Loss Properties to be outside of a SFHA. The Repetitive Loss Property information on file and provided by FEMA was utilized, and the City Engineer visited each of the 22 un-mitigated (active) RL properties on our list to determine if drainage issues, street and/or flash flooding could be identified as the source of flooding.

A review of the City's flood history, dating back to 1900 was discussed and there were differing opinions on the worst flood of record. Many



thought the 1964 was worse than the 1974; however, records indicated more damage in the latter. It was finally determined that this could just be based on better recordkeeping in later years. Pictures of past flood events as far back as 1903 were also located. In addition to the flood history, a history of the City's CRS program and past ratings was provided and discussed.



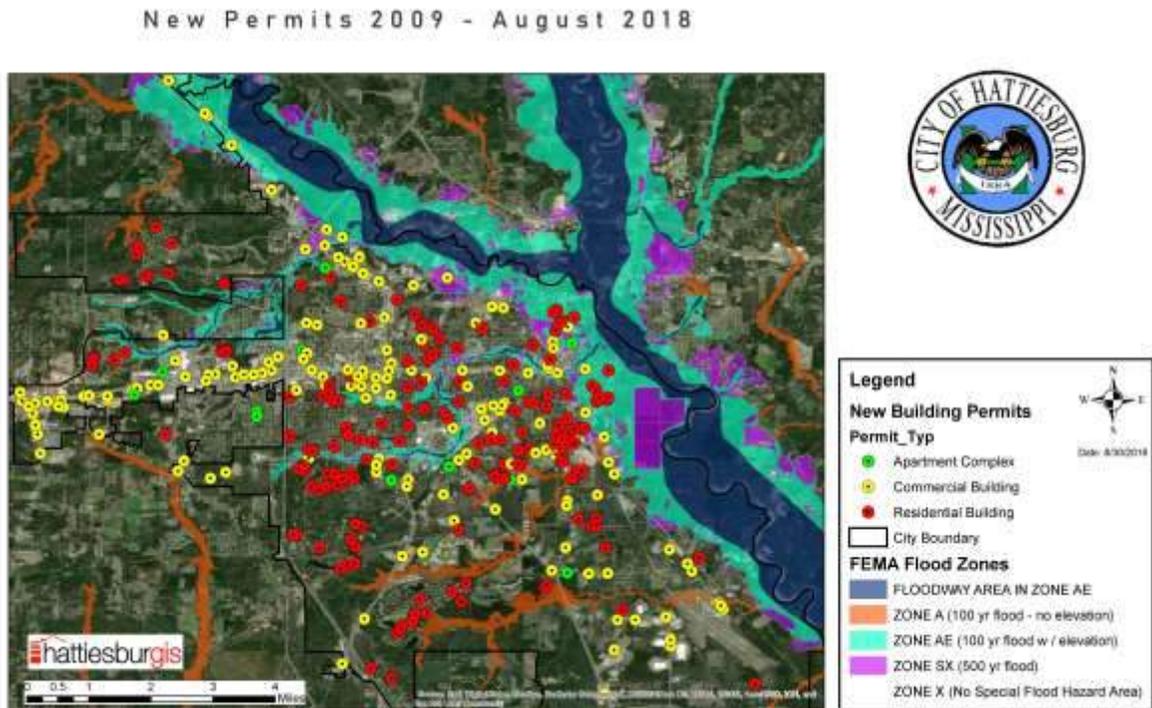
November 1948

CITY OF HATTIESBURG
FLOODPLAIN MANAGEMENT PLAN
JANUARY 2019

After review of all the pertinent documents, the Committee started listing the known problem areas, and tried to identify the source. This was done utilizing their own knowledge (many provided pictures), information documented from distributed and website questionnaires received, information provided at Town Meetings, and the public in attendance. One of the areas discussed that has not been previously addressed by the City, is the danger to residents in a flood inundation area due to a dam failure or breach. There are seven high hazards dams identified on the State’s Dam Safety website, and the Committee saw a need to change regulations addressing this issue as a life-safety measure. It was added to our range of activities to be considered later.

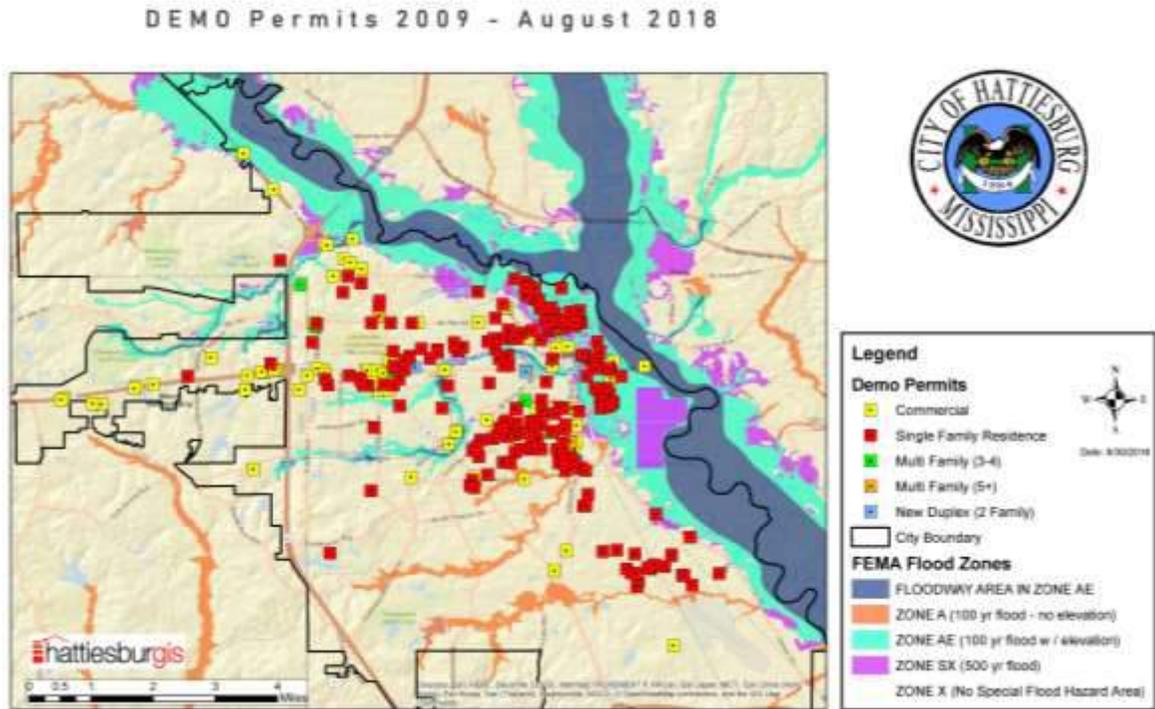
Discussion also included development and how it will affect future flooding, due to development based on demographics, and it was determined without stronger regulations it could continue to get worse. Map 4-2 shows the building permits since 2009 to show where development is most prevalent. Most of the new construction is outside the SFHA but could still be affecting the flooding in the City by adding to the watershed and our overtaxed drainage system. Map 4-3 shows the demolitions for the same time frame, and most of these do appear to be in the SFHA. It was determined that the majority of the demolitions were from either the 2013 or 2016 tornados that hit our City, and those that have rebuilt were required to elevate their homes to our one-foot (1’) freeboard regulation, making these areas less likely to flood in the future.

Map 4 –2, Building Permits 2009 – July 2018



CITY OF HATTIESBURG
FLOODPLAIN MANAGEMENT PLAN
JANUARY 2019

Map 4 - 3, Demolition Permits 2009 – July 2018



As stated above, watershed development was discussed as part of the new construction conversations, and a Watershed Plan was also added to our range of activities to be considered later in the planning process, as the Committee felt development in the Watershed played a big part of our flooding. Climate changes were discussed, but no action was considered as we did not see any major changes in the last years, except the two tornados. Since our Regional Hazard Mitigation Plan covers tornados, it was determined to keep our focus on flooding at this time.

Of the seven items listed in Section 401, we identified several major erosion (land subsidence) areas of concern in the City, at least one channel migration area, and one problem dumping site. The only levees in the City are around two Sewer Lagoons and were built to protect the lagoons and not the public.

The information was then provided to GIS to create a map of all documented problem areas. Map 4-4 and the associated list were provided to the Public Works department with a special inspection form to be used for each area reviewed. Public Works is to access the problems, and document on the inspection form: whether it just needs improved drainage maintenance; whether it would require improvements; whether the improvements could be accomplished with current budgets or would need additional funds; and which areas they were unable to find a solution for. They were asked, if possible, to also identify whether the problem would get worse in the future. This review is still underway at the writing of this

CITY OF HATTIESBURG
FLOODPLAIN MANAGEMENT PLAN
JANUARY 2019

report, and upon completion, staff will get with the City Engineer on “unsolvable” areas for his assessment and advise on each.

A brief discussion of other hazards was discussed, but the Committee choose to focus on flooding at this time and address the other issues during the updates to our Regional Multi-Hazard Mitigation Plan (HMP) in early 2019.

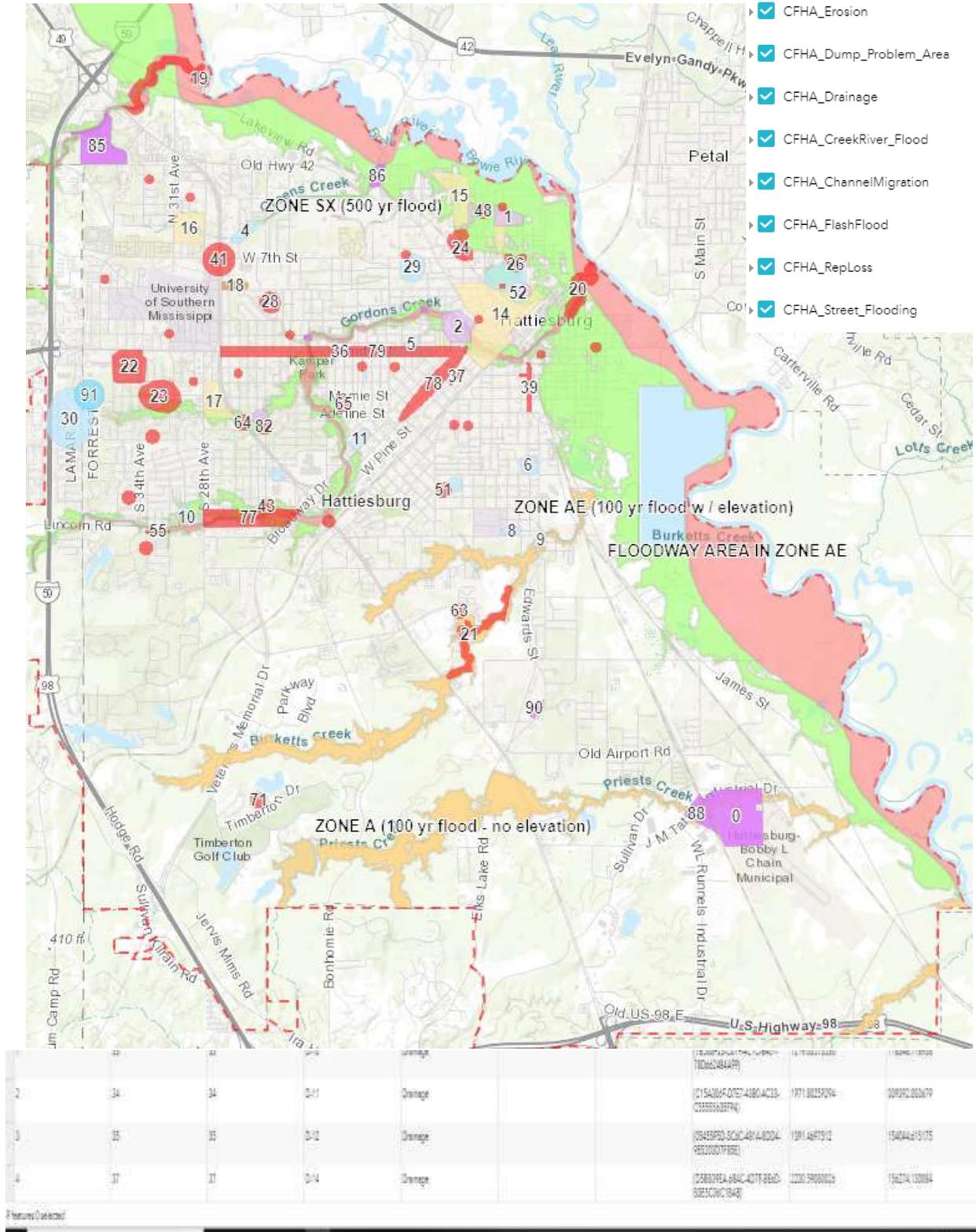
The Committee also utilized the Regional Plan’s Critical Facilities, Vulnerable Buildings and Infrastructure information, but placed as a goal for 2019 the need to update this information to verify that all information is accurate and up to date. The same applied to Historic and Cultural Features, noting that at least 1 new structure had been added to the National Register of Historic Places since the HMP was last updated. The HMP’s Flood Occurrence information containing the event year, number of feet reached, and amount of property damage was also utilized, as was the magnitude, severity, vulnerability, probability of future occurrence and risk assessment.

Notes were made on a copy of the HMP as to all areas that needed revising or updating, and provided to the Forrest County Planner, who is currently working on a revision to that plan. A copy of this “draft” given to the Council was included in our January 2019 Modification Application, and made a part of this plan in Appendix D.

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CITY OF HATTIESBURG
FLOODPLAIN MANAGEMENT PLAN
JANUARY 2019

Map 4-4. Community Assessed Flood Hazard Areas – October 2018



Step 5. Assess the Problem

On August 2, 2018 the FMP Committee held a public meeting to Assess our Problems. Again, there were several public attendees who also contributed to the conversations.

An assessment of past flooding and damages, especially those in repetitive loss areas were again discussed. It was determined by the Committee that a full Repetitive Loss Area Analysis was needed, and this item was flagged for inclusion in our goals for 2019. In the meantime, we would continue using the four RL areas identified in our previous analysis.

The entire City is vulnerable to flash flooding, a major problem in our area, so we looked at the City as a whole rather than only sections with documented past flooding. As stated above, the Committee chose to use the current Regional Multi-Hazard Plan info as to the jurisdiction’s vulnerability and impact on the community. This information showed the City was subject to major vulnerability based on the Risk Assessment for Floods and Flash Flooding, with over 100 flooding events since early 1960, totaling over 40 Million Dollars (as of 2013-we are awaiting updated info). Based on this information and the cost of construction at today’s rates we estimate that over the next ten years we could see over 2.5 Million Dollars in damages from future occurrences.

Flooding to some extent occurs in the Forrest County area virtually every year. Major floods have occurred approximately 16 times in less than 100 years. Floods are rated in severity by the rate of occurrence. A 20-year flood would be very minor and produce no appreciable damage. A 100-year flood produces major damage with evacuation needed. A 500-year flood produces major damage and evacuation is widespread.

Flooding related to river overflow is expected along major river drainage systems. Flash flooding of lesser drainage systems is also common as a result of heavy rains. Both types of flooding have typically occurred yearly and are expected to continue. Table 5-1, Flood Occurrence also shows some of the history and magnitude of flooding in Hattiesburg with the amount of property damage and number of deaths.

Table 5 – 1, Flood Occurrence

Year	Number of Feet	Number of Deaths	Type Flooding	Amount of Rainfall	Amount of Property Damage
1900	33.60	n/a	General Flooding of Severe Nature	n/a	n/a
1916	n/a	n/a	General Flooding of Severe Nature	n/a	n/a
1919	n/a	n/a	General Flooding of Severe Nature	n/a	n/a
1920	n/a	n/a	n/a	n/a	n/a
1921	n/a	n/a	n/a	n/a	n/a
1938	n/a	n/a	General Flooding of Severe Nature	n/a	n/a
1943	28.91	n/a	General Flooding of Severe Nature	n/a	n/a
1947	n/a	n/a	n/a	n/a	n/a

CITY OF HATTIESBURG
FLOODPLAIN MANAGEMENT PLAN
JANUARY 2019

Year	Number of Feet	Number of Deaths	Type Flooding	Amount of Rainfall	Amount of Property Damage
1957	n/a	n/a	n/a	n/a	n/a
1961	31.53	0	General Flooding of Severe Nature	n/a	n/a
1964	n/a	n/a	n/a	n/a	n/a
April 17, 1974	34.03	0	River Flooding	30 hours	2,600,000
March/April 1980 (2 events/April worst)	29.53	0	River Flooding	n/a	1,300,000
April 6, 1983	29.19	3	Flash and River	12 inches in 4 hours, total of 16 inches in 12 hours	32,000,000
August 6, 1987	24.85	0	Flash Flooding	3 inches in 2.5 hours, total of 3.9 inches in 5 hours	n/a
September 19, 1991	22.44	0	Flash Flooding	n/a	n/a
1993	n/a	0	n/a	n/a	n/a
1993	21.17	0	n/a	n/a	500,000
1994	22.37	0	n/a	n/a	n/a
August 4, 1995	n/a	0	Flash Flooding	4.8 in / 2.5 hrs.	20,000
1997	21.84	0	Flash Flooding	n/a	n/a
January 1998	n/a	0	Flash Flooding on Mixon's Creek	n/a	500,000
1998	21.34	0	n/a	n/a	50,000
January 31, 1999	n/a	1	Flash Flooding in Mixon's Creek Basin Area	9.85 in. per hour	500,000
March 1999	n/a	0	Flash Flooding	n/a	n/a
2001	n/a	0	n/a	n/a	n/a
2001	n/a	0	n/a	n/a	n/a
2001	n/a	0	n/a	n/a	n/a
2001	25.13	0	n/a	n/a	n/a
2001	n/a	0	n/a	n/a	n/a
2001	n/a	0	n/a	n/a	6,000
2001	n/a	0	n/a	n/a	100,000
2001	n/a	0	n/a	n/a	n/a
2001	n/a	0	n/a	n/a	n/a
2003	n/a	0	n/a	n/a	30,000
2003	n/a	0	n/a	n/a	1,000
2003	21.3	0	Flash Flooding	n/a	n/a
2003	n/a	0	n/a	n/a	10,000
2003	n/a	0	n/a	n/a	20,000
2004	n/a	0	n/a	n/a	45,000
2004	n/a	0	n/a	n/a	300,000
2004	n/a	0	n/a	n/a	2,000
2004	n/a	0	n/a	n/a	n/a
2005	n/a	0	Flash Flooding	n/a	40,000
2005	n/a	0	Flash Flooding	n/a	100,000
2005	n/a	0	Flash Flooding	n/a	300,000
July 29, 2008	n/a	0	Flash Flooding	3 in./ 1 hr.	600,000
2009	n/a	0	n/a	n/a	200,000
2009	n/a	0	n/a	n/a	50,000
2009	n/a	0	n/a	n/a	400,000

CITY OF HATTIESBURG
FLOODPLAIN MANAGEMENT PLAN
JANUARY 2019

Year	Number of Feet	Number of Deaths	Type Flooding	Amount of Rainfall / # of hours	Amount of Property Damage
2009	n/a	0	n/a	n/a	200,000
2009	n/a	0	n/a	n/a	15,000
2009	n/a	0	n/a	n/a	2,000
2009	n/a	0	n/a	n/a	5,000
2009	n/a	0	n/a	n/a	10,000
2010	n/a	0	n/a	n/a	25,000
2011	n/a	0	n/a	n/a	1,000
2011	n/a	0	n/a	n/a	250,000
2011	n/a	0	n/a	n/a	20,000
2011	n/a	0	n/a	n/a	5,000
2011	n/a	0	n/a	n/a	10,000
2011	n/a	0	n/a	n/a	50,000
2012	n/a	0	n/a	n/a	5,000
2012	n/a	0	n/a	n/a	n/a
2012	n/a	0	n/a	n/a	50,000
2012	n/a	0	n/a	n/a	50,000
2012	n/a	0	n/a	n/a	6,000
2012	n/a	0	n/a	n/a	20,000
2013	n/a	0	n/a	n/a	100,000
2013	n/a	0	n/a	n/a	n/a
We area awaiting updated info from EOC					
12/28/19	n/a	0	Flash flooding	n/a	n/a
Total					40,549,000

Source: NOAA and the Emergency Management District, 2012 and 2013.

Notes: N/a - not available

The Critical Facilities in Table 5-2 are defined for the purpose of this document as those facilities essential to the preservation of life and property during a disaster and/or those facilities critical to the continuity of government as well as those necessary to ensure timely recovery. The Committee determined eight facility types within the identified Critical Facilities. Other information gathered, such as whether or not the facility has standby power or access limitations, day and night occupancy levels, operational categories, contact names/numbers and other information is on file, but due to the privacy issues of some agencies this information is not listed in this public plan document.

CITY OF HATTIESBURG
FLOODPLAIN MANAGEMENT PLAN
JANUARY 2019

Table 5-2. Critical Facilities

ID Number	Facility Name or Designation	Street Number	Street or Location	Facility Type	Facility Function
H-026	The Emergency Management District	4080	U. S. Hwy 11	General Government	Emergency Operations Center
H-027	U.S. Postal Service - Downtown Office	115	West Pine Street	General Government	Government offices
H-028	U.S. Postal Service - Main Office	220	40th Avenue South	General Government	Postal
H-032	Hattiesburg Public Schools-Administrative Offices	301	Mamie Street	General Government	Government offices
H-043	City Hall Building	200	Forrest Street	General Government	Government offices
H-044	Hattiesburg Public Services Building	200	Front Street	General Government	Government offices
H-048	Hattiesburg Mass Transit	1001	Tipton Street South	General Government	Transportation
H-001	AAA Ambulance Service	207	28th Avenue South	Health Care	Medical / Health Care Offices
H-002	Bedfrod Care Center - Monroe Hall, LLC	298	Cahal Street	Health Care	Nursing Home
H-003	Bedford Care Center of Hattiesburg	10	Medical Blvd.	Health Care	Nursing Home
H-004	Bedfrod Care Center - Warren Hall, LLC	300	Cahal Street	Health Care	Nursing Home
H-006	Hattiesburg Clinic	415	South 28th Avenue	Health Care	Medical / Health Care Offices
H-007	Hattiesburg Convalescent Center	514	Bay Street	Health Care	Nursing Home
H-008	Hattiesburg Medical Supply	1301	28th Avenue South	Health Care	Critical Community Supplier
H-010	Loyalton of Hattiesburg	103	Fox Chase Drive	Health Care	Assisted Living Facility
H-024	Southeast MS Rural Health Initiative, Inc.	66	Old Airport Road	Health Care	Emergency Services
H-025	Southern Bone & Joint Specialists P. A.	3688	Veterans Memorial Drive	Health Care	Medical / Health Care Offices
H-055	Wesley Medical Center	5001	Hardy Street	Health Care	Hospital
H-018	Resinall Mississippi, Inc.	102	Dixie Pine Road	Industrial	Chemical Manufacturing
H-020	Salvation Army	5670	U. S. Highway 49	Non profit service	Critical community supplier
H-021	South Mississippi Chapter of the American Red Cross	606	Hutchinson Avenue	Non profit service	Emergency Services Center
H-056	Walmart Supercenter	6072	U. S. Hwy 98	Private/ Commercial	Critical Community Supplier
H-023	Southeast Aviation - Bobby Chain Airport	29	Academy Drive	Private/ Commercial	Key transportation/evacuation route
H-042	Hattiesburg Fire Department #2	810	Main Street North	Public Safety	Emergency Services Center
H-047	Hattiesburg Police Department		Government Plaza	Public Safety	Emergency Operations Center
H-049	Hattiesburg Fire Department #7	46	Parkway Blvd.	Public Safety	Emergency Services Center
H-050	Hattiesburg Fire Department #6	3902	Montague Blvd.	Public Safety	Emergency Services Center
H-051	Hattiesburg Fire Department #5	922	Hardy Street East	Public Safety	Emergency Services Center
H-052	Hattiesburg Fire Department #3	53	Academy Drive	Public Safety	Emergency Services Center

CITY OF HATTIESBURG
FLOODPLAIN MANAGEMENT PLAN
JANUARY 2019

ID Number	Facility Name or Designation	Street Number	Street or Location	Facility Type	Facility Function
H-053	Hattiesburg Fire Department #1	810	Main Street North	Public Safety	Emergency Services Center
H-054	Hattiesburg Fire Department #4	5033	U. S. Hwy 42	Public Safety	Emergency Services Center
H-009	Hattiesburg-Pelal-Forrest County Public Library	329	Hardy Street	School/ Library	Library
H-016	Presbyterian Christian Elem/Jr. High School	3901	Lincoln Road	School/ Library	Private School
H-017	Presbyterian Christian High School	221	Bonhomie Road	School/ Library	Private School
H-019	Sacred Heart School	608	Southern Avenue	School/ Library	Private School
H-033	Hattiesburg Schools - George L. Hawkins Elementary	523	Forrest Street	School/ Library	School
H-034	Hattiesburg Schools - Grace Christian Elementary	2207	West 7th Street	School/ Library	School
H-035	Hattiesburg Schools - Hattiesburg High - Blair	301	Hutchinson Avenue	School/ Library	School
H-036	Hattiesburg Schools - Hattiesburg Middle	174	W S F Tatum Drive	School/ Library	School
H-037	Hattiesburg Schools - Lillie Burney Elementary	901	Ida Avenue	School/ Library	School
H-038	Hattiesburg Schools - Rowan	500	Martin Luther King	School/ Library	School
H-039	Hattiesburg Schools - W. H. Jones Elementary	5489	Highway 42	School/ Library	School
H-040	Hattiesburg Schools - W. I. Thames Elementary	2900	Jamestown Road	School/ Library	School
H-041	Hattiesburg Schools - Woodley Elementary	2006	O'Ferrall Street	School/ Library	School
H-005	Entex Gas Pipeline Station	13	Second Avenue	Utility	Energy facility or system
H-011	Mississippi Power Company -Customer Service Office	420	Pine Street West	Utility	Energy Facility or system
H-012	Mississippi Power Company -Service Office	5082	Hwy 42	Utility	Energy Facility or system
H-013	Mississippi Power Company -Sub Station	2640	Lakeview Road	Utility	Energy facility or system
H-014	Pearl River Valley Electric Power Association		Arena Drive	Utility	Energy Facility or system
H-015	Pearl River Valley EPA Ass'n Station		U. S. Highway 49	Utility	Energy facility or system
H-022	South MS Electric Power Association	7037	U. S. Hwy 49	Utility	Energy Facility or system
H-029	Wilmut Gas & Oil Company	1614	West 4th Street	Utility	Energy facility or system
H-030	Willmut Gas Company	315	Main Street	Utility	Critical Community Supplier
H-031	Wilmut Gas Company - Lakeview Natural Gas Pipeline		Lakeview Road	Utility	Energy facility or system
H-045	Hattiesburg Water Plant #2		Lakeview Road	Utility	Water system facility
H-046	Hattiesburg Water Plant #1	900	James Street	Utility	Water System Facility

CITY OF HATTIESBURG
FLOODPLAIN MANAGEMENT PLAN
JANUARY 2019

Historic properties provide aesthetic as well as economic benefits to communities and brings people in a community together in an effort to restore and/or maintain community heritage. There are eighteen locations in the City on the National Register of Historic Places. Six of those are Historic Districts, with the remaining twelve individual structures, as shown on Table 5-3, with many of these in a SFHA.

Table 5-3. Properties on the National Register of Historic Places

Location	Date of Designation
Beverly Drive-In Theatre	July 30, 2008
Burkett's Creek Archaeological Site	April 14, 2000
East 6 th Street U.S.O. Club	April 6, 2004
Eaton School	July 16, 2008
Hattiesburg Historic Neighborhood District	September 17, 1980, Boundary Increase September 8, 2002
Hub City Historic Neighborhood District	August 29, 1980, Boundary Increases August 9, 2002 and November 9, 2012
Meador Homestead	November 5, 2010
New York Hotel Fruitland Park	April 8, 1999
North Main Street Historic Neighborhood District	April 16, 1993
Oaks Historic Neighborhood District	March 4, 1993
Old Hattiesburg High School	May 29, 1987
Parkhaven Historic Neighborhood District	August 9, 2002
Saenger Theater	May-19, 1979
Tall Pines Neighborhood District	October 16, 1980
Temple B'Nai Israel	March 2018
U.S. District Courthouse	September 18, 1973
U.S. Post Office (MS Post Offices 1931-31 TR) (F)	April 21, 1983
University of Southern Mississippi District	March 10, 2010

Source: Historic Planner, City of Hattiesburg, 2018.

Previously identified Maps 4-2 and 4-3 showing the new construction building permits and demolitions from 1999 to July 2018 were again utilized, to help the Committee identify development trends and demographics for the City.

The Committee discussed all types of problem areas, most of which were identified in the previous meeting, especially as to the following:

- life safety issues, such as

CITY OF HATTIESBURG
FLOODPLAIN MANAGEMENT PLAN
JANUARY 2019

- warning systems - there are three reporting stations located in Hattiesburg, and four river gauges in Forrest County. These are along Black Creek, Gordon's Creek and the Leaf and Bouie rivers. These instruments are used to monitor flash flooding and flooding for all of Forrest County. In 2010, a flood inundation project began which allows residents to estimate the potential for flooding based on the flood level of the Leaf River. The information is on our website and allows users to access the appropriate information. We anticipate this form of information will further educate the residents of the dangers of flooding and give a historical overview of the hazard and its effect on local development.
- and as previously discussed in this document the need to keep people and properties safe from a potential dam break or failure
- having new subdivisions provide evacuation routes for all new potential homes;
- public health issues resulting from flooded waters entering their homes and businesses causing molds and mildews, often hidden from view and only found after someone gets sick;
- stronger regulations to the protection of critical facilities, existing and future structures;
- additional infrastructure and drainage improvements are needed to mitigate flooding, especially flash and street flooding. The City's ongoing drainage enhancement program, over the last 15-18 years, has completed over 20 million dollars in drainage enhancement projects, resulting in tremendous drainage improvements, thus reducing our Repetitive Loss active properties from over 130 to 22 the flood hazard area. Additional improvements could further lessen the impact of flooding on all structures in our City;
- flood insurance promotion especially for those in a dam inundation area or those in a SFHA that are more susceptible to flooding and the knowledge that disaster funds are typically in loans that a person must qualify for and repay;
- reviewed repetitive loss properties and historical damage to buildings (see PPI Coverage Improvement Plan for breakdown of claims, etc.)
- what to do with City and State-owned properties shown on Map 5-3 which includes:
 - those acquired through tax sale, etc., are typically dilapidated or at least run down, and we need to determine if we are going to keep or sell;
 - City owned properties that are utilized as "public" buildings within a SFHA all carry flood insurance – see Table 5-4

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CITY OF HATTIESBURG
FLOODPLAIN MANAGEMENT PLAN
JANUARY 2019

Map 5-3. City and State Owned Properties as of July 2018

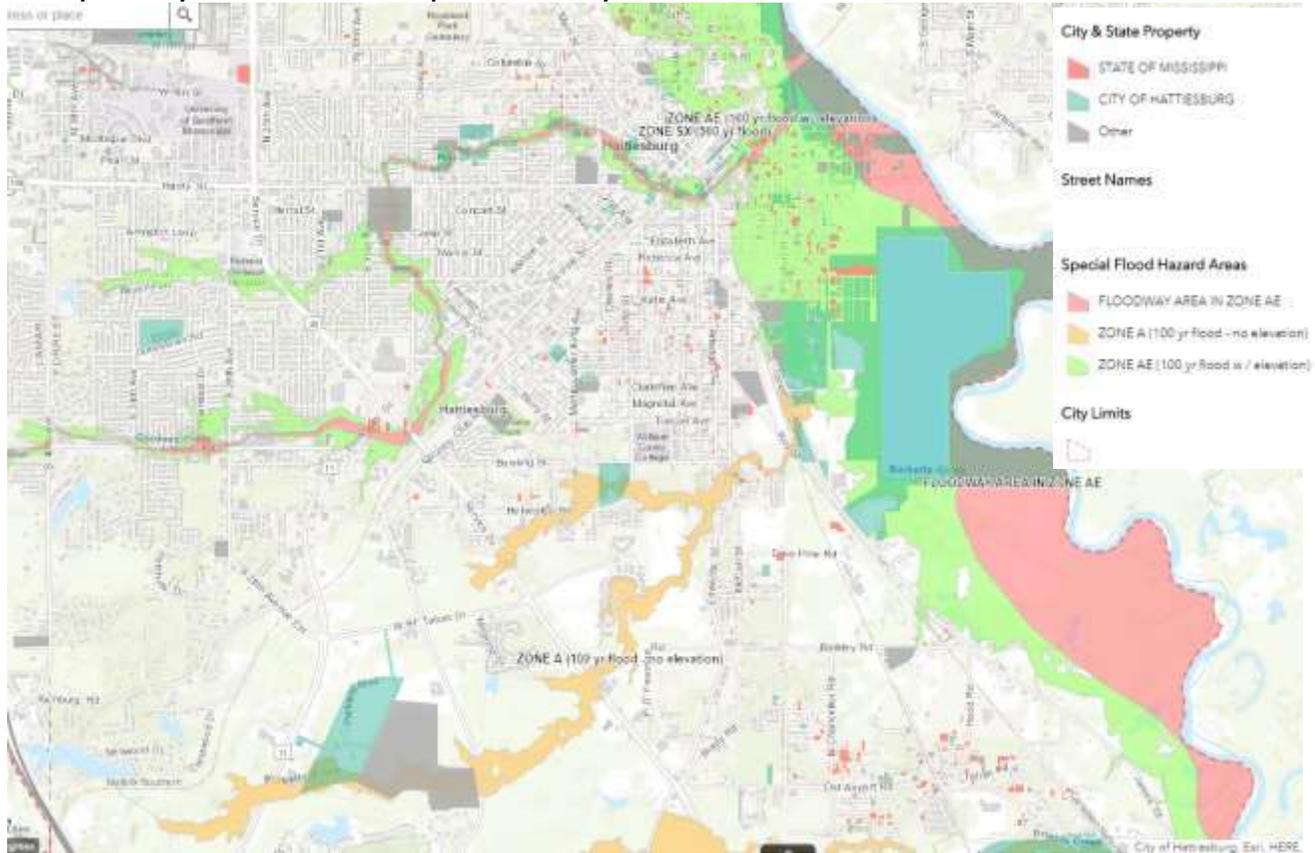


Table 5-4. City Owned Facilities in a SFHA as of December 2018

Facility Address	Renewal Date	Flood Insurance (Policy Number)
103 Faulkner Street	09-12-18	FLD1219901
109 Faulkner Street	09-12-18	FLD1219899
James Street Water Plant 2	09-12-18	FLD1219907
1109 S/S McInnis Avenue	09-12-18	FLD1219909
224 W Front Street	09-12-18	FLD1328064
300 E 5 th Street	09-12-18	FLD2117658
1506 James Street East Side	09-12-18	FLD2043334
200 Forrest Street	09-12-18	FLD1226755
300 N 12 th Avenue	09-12-18	FLD1219900

The Hazus-MH software was obtained to assist with estimating potential losses; however, we have been unable to utilize as it crashes every time we have attempted to use, and finally scrapped the program.

Various goals were touched upon, but due to time, a decision was made to hold that discussion for the next meeting.

Step 6. Set Goals

The first four goals were from the Regional Hazard Mitigation Plan, utilized as the Committee still planned to merge the two plans in the near future, and one new goal was added. These are the goals that we identified to reduce and potentially avoid long-term vulnerabilities to the identified hazards for our City.

- | | |
|----------------------|---|
| Mitigation Action 1: | Encourage the development of new buildings and infrastructure and the maintenance of existing facilities and infrastructure that will mitigate hazards. |
| Mitigation Action 2: | Foster an on-going community education program on hazard mitigation safety and preparation. |
| Mitigation Action 3: | Enhance response procedures and capabilities. |
| Mitigation Action 4: | Utilize technology to protect and develop records and data. |
| Mitigation Action 5: | Continue Coordination with Other Agencies |

Step 7. Review Possible Activities

The mitigation actions considered included the following, with detailed information in Appendix E:

- Have Public Works review entire CFHA list and report possible solutions; Regulate unsolvable CFHA items as if in a SFHA, requiring freeboard elevation, and send to FEMA for map amendment
- Place deed restrictions on any City owned vacant property - see if we can contact State and work something out with them to place on State owned as well?
- Consider Policy for properties the City acquires and/or assembles to be deed restricted of a percentage set aside as perpetual open space
- Revise setbacks in existing lots in SFHA that are not of typical sizing - may create more low-density areas by doing so.
- When the city acquires property in a flood zone, pursue lower density zoning if/when the lot size is appropriate or if we can assemble multiple properties for the purpose.
- Obtain inventory of all shorelines and what is natural vs hard surfaced
- Increase buffers along streams and rivers

CITY OF HATTIESBURG
FLOODPLAIN MANAGEMENT PLAN
JANUARY 2019

- Create outdoor water spaces for recreation and river walks (reference existing plans/studies on Twin Forks, East Hardy, and Gordon's Creek)
- Prohibit fill in SFHA
- Prohibit buildings in SFHA
- Current Ordinance prohibits some materials, consider enhancing to prohibits all materials
- Increase our Freeboard
- Require freeboard for all utilities, including ductwork
- Update Critical Facilities Information
- Consider prohibiting all enclosures
- We currently have ordinance that prohibits nurserymen from blowing yard debris into the streets and/or drains and our LDC addresses Illicit Discharge, but we need stricter enforcement, fines assessed and better outreach.
- Mill streets when repaving, so that drains are not partially covered by new street layer
- Amend Flood Prevention Ordinance to require new subdivisions with a dam to meet all the State and Federal requirements /obtain permits prior to local permitting.
- Amend Flood Prevention Ordinance to prohibit floodproofing as a flood protection measure for ALL new buildings
- Require all structures in a new Flood Inundation Area (established on State/Fed Permits) to be elevated to established Freeboard; map area and possibly submit to FEMA for map amendment OR just allow for "cluster" development OR both freeboard and cluster development
- Amend LDC to require an evacuation plan for new residential subdivisions that exceed a certain number of units/street (designate minimum number of units) for all streets in City, not just in SFHA subdivisions currently required
- Consider prohibiting new septic tanks in floodplains or flood zones.
- Consider requiring all streets in City to be elevated at or above BFE, not just in SFHA subdivisions currently required
- Consider amending our Ord for new development to prevent/reduce the increase in runoff that results from urbanization from 10-year + storm.
- Consider amending Stormwater Design Size regulations
- Consider amending Stormwater Design Storm regulations
- Consider amending our LDC to require, rather than just encourage "Green infrastructure" practices
- Consider creating a Watershed Master Plan
- Fully consider and utilize the Comprehensive Plan Action Items and the Metropolitan Transportation Plan for all future project

- Develop partnerships with local universities for future studies (Just to name a few: master planning, economic development, architectural/site analysis, environmental/health studies, etc.)
- Continue coordination with Forrest/Lamar Counties, City of Petal, and state agencies for joint projects
- Prepare a outreach and perform a detailed mitigation plan for all RL area
- Create and adopt a plan that protects natural functions, such as requiring "Green" Infrastructure; or protection of natural shorelines, ecological attributes of watershed and/or floodplain, habitat or wetland areas, etc.
- Actively pursue the installation of retention basins across city on existing vacant City owned land, to help reduce flooding
- Update inventory and maps all channels and problem sites in SFHA (or City-wide?)
- Identify possible resolutions to all identified problem sites (ex: "choke" points, chronic dumping, obstruction of flows or erosion/sedimentation problems, etc.) - possibly modifying the channel to eliminate choke points or other problem sites
- Post signs at all problem sites with no signage and prepare outreach campaign
- Targeted outreach to critical facilities asking them to keep info current and updated info sent to us as changes occur
- Revolving loan fund for elevating structures in the flood zone
- Determine if Tax Abatement can be done to credit the cost of flood insurance to a homeowner's property taxes, in a SFHA recognized and adopted by the municipalities board as a tax abatement district/zone
- Prepare a comprehensive inventory of housing in the floodplain by quality (dilapidated, elevated, good condition, etc.); and seek funding to obtain elevation certificates throughout the SFHA to assist with re-development of area
- Adequate vacuuming equipment for keeping leaves off the streets and out of drains
- I-pads for any department that requires fieldwork and can streamline to our current workflow
- Drone for GIS aerial field studies in inaccessible locations
- Purchase Survey Equipment for Verifying Residential Building Elevation
- Implement existing drainage maintenance and repairs identified in existing studies and create new studies for additional areas of need
- City-wide centralized information system to improve inter-departmental relations and actions as to policies, procedures, ordinances, projects, status tracking and needed shared information for all internal staff

Step 8. Draft an Action Plan

All draft documents attached in Appendix F

Step 9. Adopt the Plan

As stated in Step 2, the Committee held a Public Hearing on the Draft Plan on November 15, 2018, and the Council's work session on November 19th. Revisions were notes, and the final document will be in effect upon adoption by the City of Hattiesburg City Council, proposed for March 5, 2019. Upon adoption copies will be sent to FEMA Region IV, MEMA and the adopting resolution and minute order to ISO.

Step 10. Implement, Evaluate and Revise

The Floodplain Management Committee will meet at least annually to review all projects as to effectiveness, discuss and coordinate mitigation projects and review the Floodplain Plan. Revisions made by the Committee will be drafted and submitted to City Council for review and as part of the City's annual recertification package to the Community Rating System. These revisions, once approved, will be included with the plan as an appendix. Every three to five years, the plan will be reviewed to determine if significant changes have occurred that necessitate a plan update.

Continued Public Involvement

The Floodplain Management Committee will ensure public involvement through the implementation and the review of the plan. This committee will continue to be comprised of different segments of the community that include citizens, public officials, stakeholders and other interested groups.

In addition, our website will provide information on the Floodplain Management Plan and ways for on-going public input on mitigation and mitigation projects. Any public input will be a part of the Committee meetings and included in the annual review.

When the Plan is updated with significant changes, the amended plan will be adopted, and additional public hearings and reviews will be conducted.

Other Planning Mechanisms

As mentioned in Step 2, we have a number of regulatory policies in place that guide development. Examples of these planning mechanisms include the Comprehensive Plan, Land Development (Zoning) Ordinances, Building Codes, Flood Damage Prevention Ordinances, and Stormwater Protection Ordinance. As revisions are made to these documents, we will ensure that flood mitigation planning and elements of the Floodplain Management Plan are reviewed and where applicable, incorporated into the updated documents.

**RESOLUTION TO ESTABLISH A FLOODPLAIN MANAGEMENT PLANNING
COMMITTEE FOR COMMITMENT TO PRODUCE AN OVERALL STRATEGY
OF PROGRAMS AND MEASURES THAT WILL REDUCE THE ADVERSE
IMPACT OF THE FLOOD HAZARD AND HELP MEET OTHER COMMUNITY
NEEDS IN THE CITY OF HATTIESBURG, MISSISSIPPI**

WHEREAS, The City of Hattiesburg must revise its current Floodplain Management Plan, adopted in October 1999.

WHEREAS, The City of Hattiesburg will also incorporate a Program for Public Information utilizing a sub-committee of the Floodplain Management Plan Committee members;

WHEREAS, the goals of the Floodplain Management Plan are to Identify existing and future flood-related hazards and their causes, including Repetitive Loss Areas; Ensure that a comprehensive review of all possible activities and mitigation measures is conducted so that the most appropriate solutions will be implemented to address the hazard; Ensure that the recommended activities meet the goals and objectives of the community, are in coordination with land use and comprehensive planning, do not create conflicts with other activities, and are coordinated so that the costs of implementing individual activities are reduced; Ensure that the criteria used in community land use and development programs account for the hazards faced by existing and new development; Educate residents and property owners about the hazards, loss reduction measures, and the natural and beneficial functions of floodplains; Build public and political support for activities and projects that prevent new problems, reduce losses, and protect the natural and beneficial functions of floodplains; and Build a constituency that wants to see the plan's recommendations implemented; and

WHEREAS, the goals of the Program for Public Information are to Identify priority areas and the best outreach methods for the City, based on the City's different flooding and/or development conditions. Further, they will Assess flood insurance coverage and promotion; Determine priority audiences; Inventory other public information efforts; Formulate messages and outreach projects to convey messages for mailouts and website needs; Review the natural functions of all open space; Evaluate the protection of current and future critical facilities; Strengthen stream dumping regulations, enforcement and penalties.

NOW THEREFORE, The City of Hattiesburg does hereby resolve to appoint a Committee to establish the Floodplain Management Plan Committee, with all required and/or needed sub-committees.

The Committee will consist of the following departments, citizens and stakeholders:

1. The Mayor or his designee will serve as Chair.
2. Staff from Urban Developments Planning/Floodplain Management will be responsible for preparation of plan document, based on Committee's recommendations;

3. Additional City staff from the Engineering, Public Works, Building, Code Enforcement, Communications, Parks/Recreation, Water & Sewer, Grant Coordinator, and a City Council member will be required to participate; and
4. Multiple representatives from the City's population and stakeholder groups, as appointed by the Mayor.

The City will provide any, and all, necessary support, such as providing meeting location, computer equipment, copies, printing, postage and staff as needed to prepare and implement the plan.

The City will add all new and updated information to our current Multi-Jurisdictional Multi-Hazard Plan.

The Committee will meet at least twice a month, as needed, to complete the initial plan, with a projected completion date in October 2018.

The Committee and Sub-Committees will meet at least annually thereafter to ensure the implementation of the plan, as well as evaluate the effectiveness of each activity and revision of the plan as needed, at a minimum of every five (5) years.

The foregoing Resolution having been reduced to writing, the same was introduced by Council member, Delgado seconded by Council member, Dryden and was adopted by the following vote to-wit:

YEAS: George
Delgado
Carroll
Dryden
Brown

NAYS: None

THE President thereby declared the motion carried and the foregoing Resolution adopted and approved, this the 5th day of June A.D., 2018.

(S E A L)

ATTEST:

ADOPTED:


CLERK OF COUNCIL

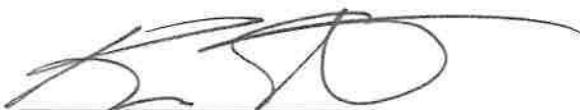

PRESIDENT

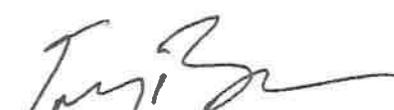
DEPUTY

THE above foregoing Resolution having been submitted to and approved by the Mayor, this the 5th day of June A.D., 2018.

ATTEST:

APPROVED:


CITY CLERK


MAYOR



DESIGNATED REPRESENTATIVE

We, the City of Hattiesburg, MS, do hereby designate Andrew Ellard to represent the City in all matters pertaining to the development of the District Eight (8) Regional Hazard Mitigation Plan.

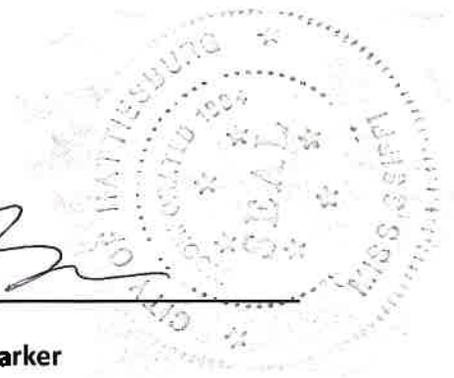
IN WITNESS WHEREOF, We have subscribed our signature this, the 4th day of October, 2018



A handwritten signature in black ink, appearing to read 'Toby Barker', is written over a horizontal line.

Mayor Toby Barker

City of Hattiesburg, MS





**INTENT TO PARTICIPATE IN THE 2019 UPDATE OF THE DISTRICT 8
REGIONAL HAZARD MITIGATION PLAN.**

We, the City of Hattiesburg, MS, do hereby resolve to participate in the development of the District Eight (8) Regional Hazard Mitigation Plan. This participation is limited to allowing City employee(s) to attend meetings with District 8 representatives and others to gather requested information pertaining to the City of Hattiesburg for inclusion into the plan.

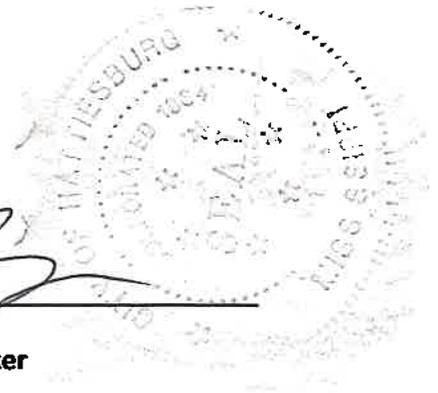
IN WITNESS WHEREOF, We have subscribed our signature this, the 4th day of October, 2018



A handwritten signature in black ink, appearing to read 'Toby Barker', is written over a horizontal line.

Mayor Toby Barker

City of Hattiesburg, MS



There came on for consideration at a duly constituted meeting of the Mayor and Members of the City Council of the City of Hattiesburg, Mississippi, held on the 5th day of **March, 2019**, the following Resolution:

RESOLUTION 2019-73

**ADOPT A RESOLUTION REVISING THE 1999 FLOODPLAIN
MANAGEMENT PLAN AND ESTABLISHING THE PROGRAM FOR PUBLIC
INFORMATION OUTREACH AND COVERAGE IMPROVEMENT PLAN
FOR COMMITMENT TO PRODUCE AN OVERALL STRATEGY
OF PROGRAMS AND MEASURES THAT WILL REDUCE
THE ADVERSE IMPACT OF THE FLOOD HAZARD
IN THE CITY OF HATTIESBURG, MISSISSIPPI**

WHEREAS, The City of Hattiesburg established the Floodplain Management Committee, and Program for Public Information Committee Sub-Committee by Resolution on June 5, 2018; and

WHEREAS, the goals of the Floodplain Management Plan are to Identify existing and future flood-related hazards and their causes, including Repetitive Loss Areas; Ensure that a comprehensive review of all possible activities and mitigation measures is conducted so that the most appropriate solutions will be implemented to address the hazard; Ensure that the recommended activities meet the goals and objectives of the community, are in coordination with land use and comprehensive planning, do not create conflicts with other activities, and are coordinated so that the costs of implementing individual activities are reduced; Ensure that the criteria used in community land use and development programs account for the hazards faced by existing and new development; Educate residents and property owners about the hazards, loss reduction measures, and the natural and beneficial functions of floodplains; Build public and political support for activities and projects that prevent new problems, reduce losses, and protect the natural and beneficial functions of floodplains; and Build a constituency that wants to see the plan's recommendations implemented; and

WHEREAS, the goals of the Program for Public Information are to Identify priority areas and the best outreach methods for the City, based on the City's different flooding and/or development conditions. Further, they will Assess flood insurance coverage and promotion; Determine priority audiences; Inventory other public information efforts; Formulate messages and outreach projects to convey messages for mailouts and website needs; Review the natural functions of all open space; Evaluate the protection of current and future critical facilities; Strengthen stream dumping regulations, enforcement and penalties.

NOW THEREFORE, The City of Hattiesburg does hereby resolve to adopt a new Floodplain Management Plan, which establishes new goals to further mitigate all flooding types.

BE IT FURTHER RESOLVED that the City of Hattiesburg does hereby establish as a part of the Floodplain Management Plan a Property for Public Information (PPI) Outreach and Coverage Improvement Plan, as an overall strategy of programs and measures that

outlines Outreach Needs, Flood Insurance Promotion and other items to inform the public about safety and precautions to be taken before, during and after a flood.

The above and foregoing Resolution, after having been first reduced to writing was introduced by Council Vice President Dryden, seconded by Council Member Delgado, and was adopted by the following vote, to-wit:

YEAS:

**George (via teleconference)
Delgado
Carroll
Dryden
Brown**

NAYS:

None

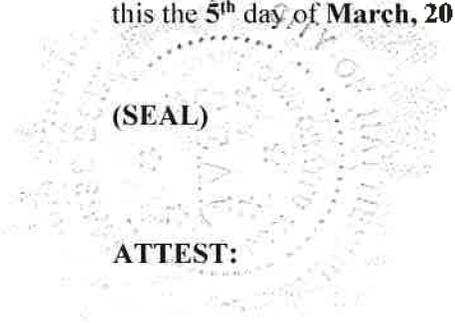
ABSENT:

None

The President thereby declared the motion carried and the Resolution adopted and approved, this the 5th day of March, 2019.

(SEAL)

ATTEST:


Ronda S. Cole
CLERK OF COUNCIL

ADOPTED:

R. Cole
COUNCIL PRESIDENT

The above and foregoing Resolution having been submitted to and approved by the Mayor, this the 5th day of March, 2019.

ATTEST:

[Signature]
CITY CLERK

ADOPTED:

[Signature]
MAYOR



FLOODPLAIN MANAGEMENT PLANNING COMMITTEE

TABLE OF CONTENTS

1. Committee/Sub – Committee Sign In

2. Agendas & Time Line

- 2a. FMP – Schedule of Proposed Meetings
- 2b. PPI – Schedule of Proposed Meetings

3. Resolutions & Ordinances

- 3a. Flood Ordinance – 3224
- 3b. Resolution – Drainage System Maintenance

4. NFIP Fundamentals & CRS

- 4a. Floodplain Fundamentals
- 4b. Natural and Beneficial Functions of Floodplains
- 4c. NFIP Partnerships
- 4d. Credit Points and Classification
- 4e. NFIP – Sample Flood Insurance Rates
- 4f. 2009 – 2014 with 2018 Projections Report

5. CRS Manual – Section 300

- 5a. 300 Public Information Activities..... 300-1
- 5b. 310 Elevation Certificates..... 310-1
- 5c. 320 Map Information Service..... 320-1
- 5d. 330 Outreach Projects..... 330-1
- 5e. 340 Hazard Disclosure..... 340-1
- 5f. 350 Flood Protection Information..... 350-1
- 5g. 360 Flood Protection Assistance..... 360-1
- 5h. 370 Flood Insurance Promotion..... 370-1

6. CRS Manual – Section 400

- 6a. 400 Mapping and Regulations..... 400-1
- 6b. 410 Flood Hazard Mapping..... 410-1
- 6c. 420 Open Space Preservation..... 420-1
- 6d. 430 Higher Regulatory Standards. 430-1
- 6e. 440 Flood Data Maintenance..... 440-1
- 6f. 450 Stormwater Management..... 450-1



FLOODPLAIN MANAGEMENT PLANNING COMMITTEE

TABLE OF CONTENTS

7. CRS Manual – Section 500

- 7a. 500 Flood Damage Reduction Activities..... 500-1
- 7b. 510 Floodplain Management Planning..... 510-1
- 7c. 520 Acquisition and Relocation..... 520-1
- 7d. 530 Flood Protection..... 530-1
- 7e. 540 Drainage System Maintenance..... 540-1

8. CRS Manual – Section 600

- 8a. 600 Warning and Response..... 600-1
- 8b. 610 Flood Warning and Response..... 610-1
- 8c. 620 Levees..... 620-1
- 8d. 630 Dams..... 630-1

9. COH Comp Plan - Chapter 2

- 9a. Executive Summary

10. COH Comp Plan - Chapter 4

- 10a. Goals and Strategies

11. COH Comp Plan - Chapter 6

- 11a. The Natural Environment

12. COH Comp Plan - Appendix B

- 12a. Infrastructure

13. Hattiesburg LDC – Section 8

- 13a. Infrastructure Standards

14. Hattiesburg LDC – Section 9

- 14a. Environmental Standards

15. Hattiesburg’s Flooding History

- 15a. History of Flooding in COH and How You Can Help Protect...
 - 15b. NFIP Mapping Terminology
 - 15c. Hattiesburg Flood Hazard Area Map
 - 15d. Hattiesburg Flood Zone Map
 - 15e. Hattiesburg Repetitive Loss Map



FLOODPLAIN MANAGEMENT PLANNING COMMITTEE

TABLE OF CONTENTS

15f. Watershed, Hydrology, Hydraulics, Floodplain Schematics

16. MEMA Quick Guide

16a. About this Guide

16b. Introduction

16c. Background

16d. Flood Insurance

16e. Floodplain Management: Introduction

16e i. A Few of the Basic Definitions

16f. Floodplain Management in Mississippi: The Basic Facts

16g. What Enforcement Actions Can Be Taken Against a Community?

16h. What Corrective Measures Can Be Taken By a Community?

16i. What if My Community Doesn't Participate or...Withdraws or is Suspended?

16j. Summary

16k. National Flood Insurance Program

16l. NFIP Community Rating System

16m. Flood Insurance is Your Best Protection

16n. Community Responsibilities

16o. Understanding the Riverine Floodplain

16p. Understanding the Floodway

16q. Understanding the Riverine Floodplain

16r. Use the Riverine Flood Profile to Determine BFEs

16s. Understanding the Coastal Floodplain

16t. The Flood Insurance Rate Map (Coastal)

16u. Unnumbered A Zone

16v. Letters of Map Change (LOMC)

16w. Is Your Building Site Higher Than the BFE?

16x. Some of the Activities Requiring Permits

16y. Safe Uses of The Floodplain

16z. What is Meant by Pre-FIRM and Post-FIRM?

16aa. Nature Doesn't Read Maps!

16bb. Think Carefully Before You Seek a Variance

16cc. Some Key Steps in Permit Review

16dd. Carefully Complete the Permit Application

16ee. Freeboard: Go the Extra Foot

16ee. What is the Elevation Certificate and How is it Used?

16ff. Paperwork is Important for You and Your Community

16gg. Compaction of Floodplain Fill

16hh. Floodplain Fill Can Make Things Worse



FLOODPLAIN MANAGEMENT PLANNING COMMITTEE

TABLE OF CONTENTS

- 16ii. The Floodway “No-Rise / No-Impact” Certificate
 - 16jj. Floodway Data Tables
- 16kk. How to Elevate Your Floodplain Structure
 - 16ll. Basements Are Unsafe in a Floodplain
- 16mm. Manufactured Homes Deserve Special Attention
 - 16nn. Enclosures Below BFE (A Zone Only)
- 16oo. Typical Elevation Methods for Coastal Construction
 - 16pp. The V Zone Certificate
- 16qq. Coastal Structure Must Resist Wind and Water Forces
 - 16rr. Enclosures Below V Zone Structures
 - 16ss. Utility Service for Structures
 - 16tt. Septic Structures
 - 16uu. Accessory (Appurtenant) Structures
 - 16vv. Recreational Vehicles
 - 16ww. Agricultural Structures
- 16xx. Planning to Improve Your Floodplain Structure?
 - 16yy. What About After Damage?
 - 16zz. Substantial Damage Estimator
 - 16aaa. Paying for Post Flood Compliance – ICC
 - 16bbb. Elevating a Pre-FIRM Structure
- 16ccc. Small Levees and Floodwalls Can Protect Pre-Firm Structures
 - 16ddd. Flood prone Property Acquisition Projects
 - 16eee. Useful Resources
 - 16fff. Want to Learn More?



FLOODPLAIN MANAGEMENT PLANNING COMMITTEE

Meeting 1 - July 5, 2018

Train Depot Conference Room

10:30 – 12:00

1. Call to Order
2. Prayer
3. Introduction of Committee Members
4. Brief Overview of Items in Binder:
 - The Community Rating System Program
 - Credit Points and what they mean to the citizens
 - Hattiesburg's Flooding History
 - Overall time line with activity overview of both the Floodplain Management Planning Committee, and the sub-committee entitled the Program for Public Information
 - Understanding the CRS Manual (Excerpts – Sections 300 – 600)
 - How Comprehensive Plan 2008 – 2028 is relative
5. Review of Assignment for Meeting 2
 - Assessing the Hazard
6. Questions/Answers

7. Adjourn

Tab Order:

1. Agenda
2. Committee Rosters/Sign-In Sheets
3. CRS Program/Points/History
4. Time Line/Duties
5. CRS Manual – Sec 300
6. CRS Manual – Sec 400
7. CRS Manual – Sec 500
8. CRS Manual – Sec 600
9. Reference Materials
10. Assess Hazards
11. Assess Problems
12. Goals
13. Possible Activities
14. Draft Plan

CONTACT ROSTER

(Full committee roster will be provided by next meeting)

Nick Williams, Planner / CRS Coordinator or
Lisa Reid – CRS Consultant)

E-Mail: nwilliams@hattiesburgms.com

Phone (601) 554-1019

Ginger Lowrey, Planning Division Manager

E-Mail: glowrey@hattiesburgms.com

Phone: (601) 545-4591



Minutes: 7-5-2018 Meeting

Nick – Planning Dept

Lisa – Consultant

1. Binder Review
 - a. Quick overview of FPM Binder for committee. (See 7/5/18 Agenda for full list)

- Future Activities Overview. (Binder Section 2) – Hattiesburg Train Depot. Meeting Details are covered more in depth in Schedule of Proposed Meetings 2018. Handout
 - a. Meeting 2 – 7-19 - Assess the Hazard
 - b. Meeting 3 – 8-2 – Assess the Problem
 - c. Meeting 4 – 8- 16 – Assess the Problem con’t – Goal Setting
 - d. Meeting 5 – 8-30 – Goal Setting
 - e. Meeting 6 – 9-13 – Review Activities – Drafting Action Plan
 - f. Meeting 7 – 9-27 – Draft Action Plan
 - g. Meeting 8 – 10-4 – Review Draft
 - h. Meeting 9 – 10-18 – Final Review
 - i. Meeting 10 – October TBD – Public Hearing
 - j. Meeting 11 – 11-19 – Adopt plan
 - k. Meeting 12 – TBD – Implement, Evaluate, Revise

- Subcommittee – Mayor to Finalize.
 - a. PPI Committee
 - i. Samantha McCain, Public Information Officer
 - ii. Nick Williams, Planner/CRS Coordinator
 - iii. Lisa Reid, CRS Consultant/Floodplain Resident
 - iv. Local Insurance Agent
 - v. Local Real Estate Agent
 - vi. Citizen Volunteers

 - b. Committee Duties
 - i. Evaluate effective public media outlets.
 - ii. Coordinate public info activities
 - iii. Flood response preparation
 - iv. Disclosure of hazards
 1. Real Estate Agents
 2. Insurance Agents
 - v. Website Development
 - vi. Property protection advice
 1. City Staff to Review
 - vii. Insurance Coverage Assessment

2. Prep for Next Meeting
 - a. Reading Section 500. Particularly sections beginning on pg 500-13.
 - b. Reach out to Neighborhood Associations for any input
 - i. Distribute Flooding Questionnaire. Nick is going to provide a digital copy.
 - ii. Put on Website
 - iii. Pass out to neighbor's and your Neighborhood Association
 - iv. Send to Facebook Groups

Currently the City of Hattiesburg is a Class 8 according to the CRS Classification. This is based on a point system designed by the NFIP. With projects being prepared by staff, we estimated we currently have 1497 points, putting us only 3 points shy of moving to a level 7.

*** Deadline for the submitting The Floodplain Management Plan is January 2019. It was advised that we have everything in by the end of November to ensure we are able to get everything processed in time w/ the NFIP.



FLOODPLAIN MANAGEMENT PLANNING COMMITTEE (FMP)

Schedule of Proposed Meetings - between July 5, 2018 and November 19, 2018

Meeting 1 – July 5th: Introduction of Team and Overview of Process/Duties

Meeting 2 – July 19th: Assess the Hazard

- a. An assessment of all flood hazards (including source of water, depth of flooding, velocities and warning time) including:
 - The Special Flood Hazard Area (SFHA) shown on the Flood Insurance Rate Map (FIRM);
 - Repetitive loss areas;
 - Areas not mapped on the FIRM that have flooded in the past, such as street flooding, drainage issues, etc.;
 - Other surface flooding identified in other studies; and
 - An assessment of less-frequent flood hazards including an inventory of levees and/or dams that would result in a flood of developed areas if they failed or were overtopped during a flood.
- b. Map the area(s) identified above; and
- c. Summarize the hazard(s) in lay terms.

Meeting 3 – August 2th: Assess the Problem

- a. An overall summary of the jurisdiction's vulnerability to each hazard identified in the hazard assessment and the impact on the community (include a description of the impact of flooding and what kinds of problems arise);
- b. A description of the impact that the hazards identified in the hazard assessment have on the features listed below:
 - Life safety and the need for warning and evacuating;
 - Public health, including health hazards from flood waters and mold;
 - Critical facilities and infrastructure;
 - Community's economy and major employers; and
 - Number and types of affected buildings (e.g., residential, commercial, industrial). The assessment must include an inventory of all buildings owned by the community located in flood-prone areas and identifies which buildings are insured for flood damage.
- c. The assessment should include a review of:
 - Historical damage to buildings;
 - All repetitive loss properties;
 - All properties that have received flood insurance claims payments (potential damage and dollar losses) natural functions, (such as wetlands, riparian areas, sensitive areas, and habitat for rare/endangered species);
 - Description of development, redevelopment, and population trends and a discussion of what the future brings for development and redevelopment in the community, the watershed, and natural resource areas; and
 - Description of the impact of the future flooding conditions on people, property, and natural floodplain functions.

Meeting 4 - August 16th: Assess the Problem – continued (if needed) and start Setting Goals

- a. Include a statement of the goals of the community's floodplain management and hazard mitigation programs; and
- b. The goals must address all flood-related problems identified in the Problem Assessment.

Meeting 5 - August 30th: Setting Goals – continued (if needed) and start Reviewing Possible Activities

- a. Review preventive activities, such as zoning and land use ordinances, floodplain management regulations, storm water management regulations, building codes, subdivision ordinance, preservation of open space, comprehensive plans and the effectiveness of current regulatory and preventive standards and programs that could prevent or reduce the severity of the problems identified in the Problem Assessment.

- b. The review should include:
 - How these tools can reduce future flood losses;
 - The current standards in the community's plans and regulations;
 - Whether the community should adopt or revise such plans and regulations;
- c. Address each category of Floodplain Management Activities as outlined in the chart on page 510-20 of manual
- d. Fully describe all activities considered and the discussion of why the activity is or is not appropriate for the community and its flood problems (plan must include the pros and cons for each proposed activity); and
- e. For all activities determined to be appropriate and/or feasible for the community, plan must include:
 - The Community's capability to fund and implement the activity;
 - For all currently implemented activities, the plan must note if the activity is achieving expectations and, if not, whether it should be modified; and
 - If the plan is an update of a previously credited plan, each activity recommended by the previous plan must be discussed; along with the status of implementation.

Meeting 6 – September 13th: Review possible activities – continued (if needed) and start Drafting Action Plan

- a. Select and specify the activities appropriate to the community's resources, hazards, and vulnerable properties. In every case, the community should implement preventive activities both to keep its flood problems from getting worse and to protect new construction from the effects of natural hazards.
 - 1. For each recommendation, the action plan must identify:
 - Who is responsible for implementing each action;
 - When it will be done; and
 - How it will be funded.
 - 2. Prioritize all selected actions;
 - 3. Every action identified in Goals must have an Action Plan;
 - 4. If plan calls for acquiring properties, action plan must include how project(s) will be managed and how the land will be used after acquisition.
- b. Establish or revise post-disaster redevelopment and mitigation policies and procedures. These policies and procedures should account for the expected damage from a base flood or other disaster. Post-disaster mitigation procedures should assign responsibilities for public information, code enforcement, planning, and other efforts that encourage, mandate, and/or fund loss reduction activities; and
- c. Plan includes action items (other than public information activities) to mitigate the effects of the other natural hazards identified in the hazard assessment.

Meeting 7 - September 27th: Draft an action plan – continued (if needed)

Meeting 8 - October 4th: Initial Review of Draft Plan

Meeting 9 – October 18th: Final Review of Draft Plan

Meeting 10 – (date to be determined – last week of October or first week of November): Public Hearing

- a. Hold a public hearing on the draft plan to receive comments; and
- b. Send draft to ISO for review prior to adoption.

Meeting 11 – November 19th: Adopt the Plan (placed on City Council Agenda by November 9th)

Meeting 12 - Implement, evaluate, and revise

- a. Monitoring, implementation, reviewing progress, and recommending revisions to the plan in an annual evaluation report. The report must be submitted to the governing body, released to the media, and made available to the public; and
- b. The committee must continue to meet the representation, quorum, and other criteria that was established in the beginning, and should meet quarterly.



FLOODPLAIN MANAGEMENT PLANNING COMMITTEE

Schedule of
Proposed
Meetings
between
July 5, 2018
and
November 19, 2018



HELLO!

I am Nick Williams

I am here because I love to give presentations.

2.

ASSESS THE HAZARD

Meeting 2 – July
19th

Let's get
started!

“

There are hazards in anything one does but there are **greater** hazards in doing nothing.



ASSESS THE HAZARD

- ▶ An assessment of all flood hazards including:
- ▶ The Special Flood Hazard Area (SFHA) shown on the Flood Insurance Rate Map (FIRM);
- ▶ Repetitive loss areas;
- ▶ Areas not mapped on the FIRM that have flooded in the past
- ▶ Other surface flooding identified in other studies; and
- ▶ An assessment of less-frequent flood hazards
- ▶ Map the area(s) identified above; and
- ▶ Summarize the hazard(s) in lay terms.



FIND IT MAP IT!

It's important that we submit all additional data to GIS for intergration.

3.

ASSESS THE PROBLEM

Meeting 3 – August
2nd

What shape
are we in?



ASSESS THE PROBLEM

Overall Summary

of the jurisdiction's **vulnerability** to each hazard identified in the hazard assessment and the **impact on the community**

Describe the Impact

that the hazards identified in the hazard assessment have



ASSESS THE PROBLEM continued

Life Safety

and the need for
warning and
evacuating

Public Health

including health
hazards from flood
waters and old

Critical Facilities

And infrastructure

Economy

and major
employers

Number and Building Types

affected



ASSESSMENT SHOULD INCLUDE A REVIEW OF

- ▶ Historical damage to buildings;
- ▶ All repetitive loss properties;
- ▶ All properties that have received flood insurance claims payments, natural functions,;
- ▶ Description of development, redevelopment, and population trends and a discussion of what the future brings for development and redevelopment in the community, the watershed, and natural resource areas; and
- ▶ Description of the impact of the future flooding conditions on people, property, and natural floodplain functions.



4.

ASSESS THE PROBLEM (continued)

Meeting 4 – August
16th

No problem? Let's
start setting goals



STATE OUR
GOALS
Of the HMP
and FMP

A GOAL
WITHOUT
A PLAN
IS JUST
A WISH

5.

SETTING GOALS (continued)

Meeting 5 – August
30th

If goals are done,
we'll start reviewing
possible activities



REVIEWING POSSIBLE ACTIVITIES

Review Preventive Activities

such as zoning and land use ordinances, floodplain management regulations, storm water management regulations, building codes, subdivision ordinance, preservation of open space, comprehensive plans and the effectiveness of current regulatory and preventive standards and programs that could prevent or reduce the severity of the problems identified in the Problem Assessment.

Review should include:

- ▶ How these tools can reduce future flood losses;
- ▶ The current standards in the community's plans and regulations;
- ▶ Whether the community should adopt or revise such plans and regulations;



REVIEWING POSSIBLE ACTIVITIES

1. Preventive
2. Property Protection
3. Natural Resource Protection
4. Emergency Services
5. Structural Projects
6. Public Information



Describe the Impact that the hazards identified in the hazard assessment have



REVIEWING POSSIBLE ACTIVITIES

Fully describe all activities considered

and the discussion of why the activity is or is not appropriate for the community and its flood problems

Is it appropriate and/or feasible?

- ▶ The Community's capability to fund and implement the activity;
- ▶ For all currently implemented activities, the plan must note if the activity is achieving expectations and, if not, whether it should be modified; and
- ▶ If the plan is an update of a previously credited plan, each activity recommended by the previous plan must be discussed; along with the status of implementation.

6.

REVIEW POSSIBLE ACTIVITIES (continued)

Meeting 6 – September
13th

If reviews are done,
we'll start drafting an
Action Plan



DRAFTING ACTION PLAN

Select and specify the activities appropriate

to the community's resources, hazards, and vulnerable properties.

Action Plan MUST IDENTIFY

- ▶ Who is responsible for implementing each action;
- ▶ When it will be done; and
- ▶ How it will be funded

Prioritize ALL Selected Actions

Every action identified in GOALS MUST have an Action Plan

FOR ACQUIRING PROPERTIES

Plan must include how they will be managed and used



ESTABLISH OR REVISE POST-DISASTER REDEVELOPMENT AND MITIGATION POLICIES & PROCEDURES

- ▶ These policies and procedures should account for the expected damage from a base flood or other disaster. Post-disaster mitigation procedures should assign responsibilities for public information, code enforcement, planning, and other efforts that encourage, mandate, and/or fund loss reduction activities; and
- ▶ Plan includes action items (other than public information activities) to mitigate the effects of the other natural hazards identified in the hazard assessment.



7.

DRAFT AN ACTION PLAN (continued)

Meeting 7 – September
27th

If needed

8.

**INITIAL REVIEW
OF DRAFT PLAN**

**Meeting 8 – October
4th**

We're on our way!

9.

**FINAL REVIEW
OF DRAFT PLAN**

**Meeting 8 – October
18th**

**Hardwork is paying
off!**

10.

**PUBLIC
HEARING**

**Meeting 8 – October
18th**

Date to be determined
Last week of October or first
week of November

A blurred office desk with a computer monitor, a cup, and papers. The background shows a window with a grid pattern and a chair.

**SEND
DRAFT TO
ISO FOR
REVIEW**
Prior to
adoption

11.

ADOPT THE PLAN

**Meeting 11 – November
19th**

CONGRATS! WE DID IT!
Placed on City Council
Agenda by November 9th

12.

**IMPLEMENT,
EVALUATE, &
REVISE**

Meeting 12 – TBA

Making room for
improvement

ANNUAL EVALUATION REPORT



IMPLEMENT, EVALUATE, & REVISE



The report must be submitted to the governing body, released to the media, and made available to the public; and

The committee must continue to meet the representation, quorum, and other criteria that was established in the beginning, and should meet quarterly.



THANKS!

Any questions?

You can contact Nick Williams at 601.554.1019 or email nwilliams@hattiesburgms.com



FLOODPLAIN MANAGEMENT PLANNING COMMITTEE

Meeting 7 - September 27, 2018

Train Depot Conference Room

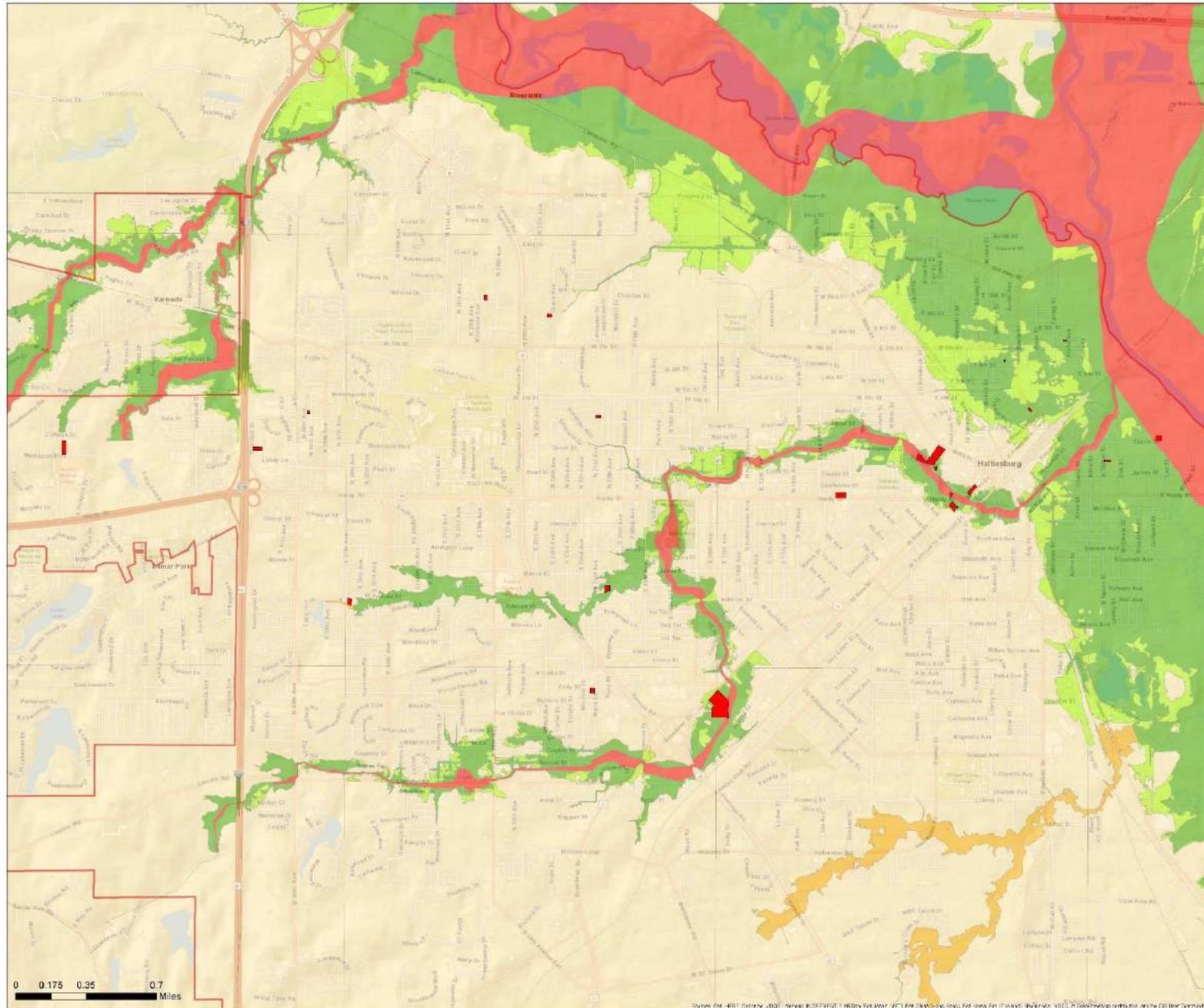
4:00 – 5:30

1. Call to Order
2. Prayer
3. Minutes
4. Prioritize our Goals
5. Questions/Answers
6. Next meeting announcement – Oct 25th
7. Adjourn



Assess the Hazards
City of Hattiesburg
Floodplain Management Plan Committee
July 19, 2018

Repetitive Loss Locations



Legend

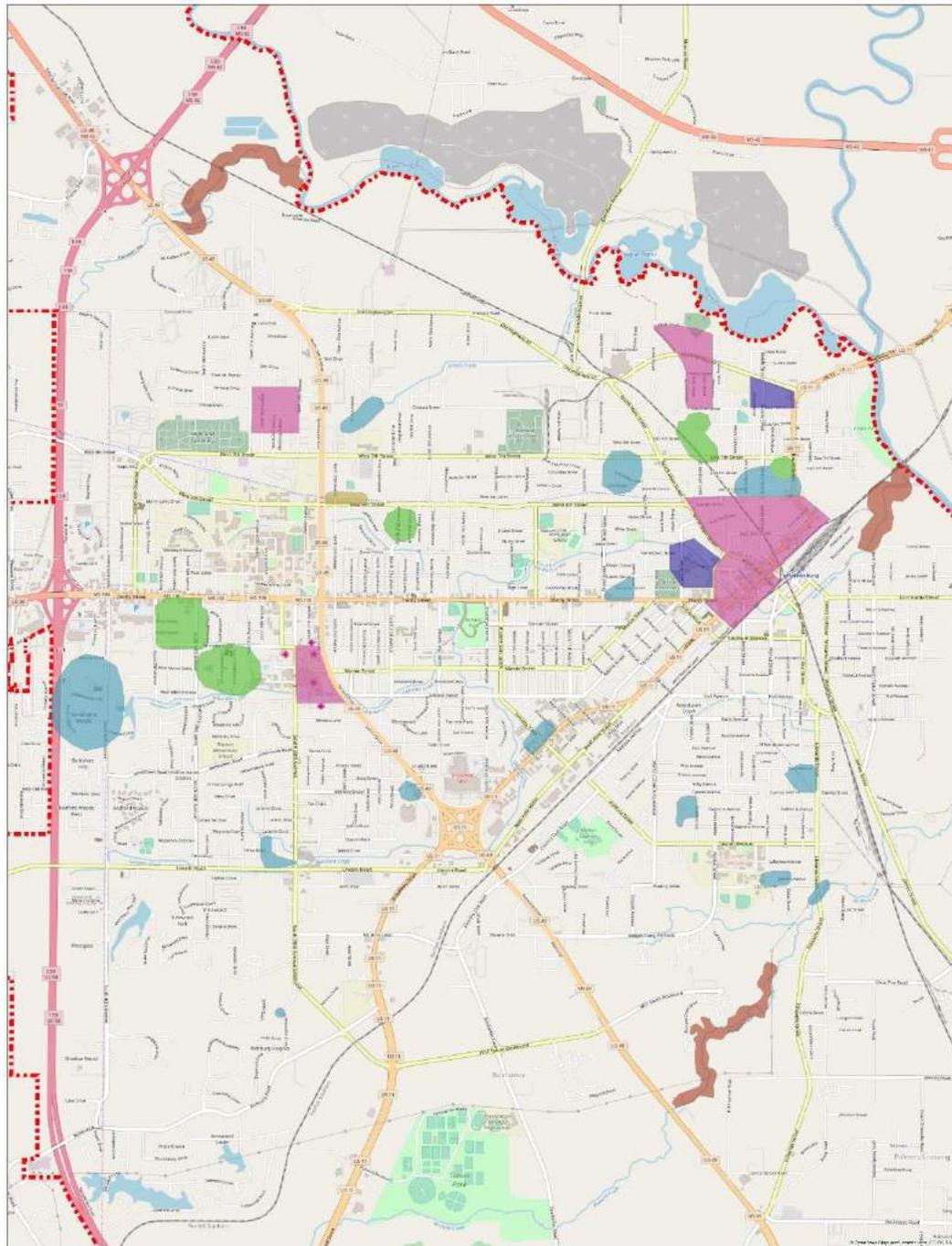
- Repetitive Loss Locations
- City Boundary
- Floodway area in Zone AE
- Zone A (100 year flood, no elevation)
- Zone AE (100 year flood w/ elevation)
- Zone SX (500 Year Flood)
- Zone X (No Special Flood Hazard Area)



Date: 7/18/2018

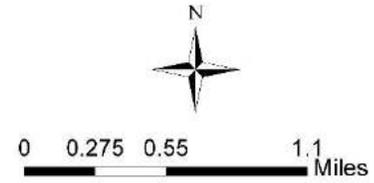
Map provided by the GIS Division of the
HPFL Metropolitan Planning Organization
Department of Federal & State Programs
City of Hattiesburg, Mississippi

This map is unofficial and is subject to validation.
It is not intended for site specific review.
It does not necessarily reflect the most current
changes and was created for general planning purposes only.
Map created Wednesday, July 18, 2018.



- Legend**
- Creek / River Flood
 - Drainage
 - Erosion
 - Flash Flooding
 - Repetitive Loss
 - Street Flooding
 - City Limits

Hattiesburg Flood Hazard Areas



Date: 8/2/2018
 Map provided by the GIS Division of the
 HPIU Metropolitan Planning Organization
 Department of Economic & Smart Programs
 City of Hattiesburg, Mississippi
 This map is unofficial and is subject to validation.
 It is not intended for site specific review
 it does not necessarily reflect the most current
 changes and was created for general planning purposes only.
 Map created Thursday, June 21, 2018.



FLOODPLAIN MANAGEMENT PLANNING COMMITTEE

Public Hearing - July 19, 2018

SIGN IN SHEET

PRINT NAME	PRINT ADDRESS	EMAIL	PHONE NUMBER
Ginger Lawrey	PO Box 1898 H'burg	Glawrey01hobbiesburgms.com	601-545-4599
ANDY PARKER	PO Box 1898 H'burg	AParker@HATTSBURGMs.com	601-545-1541
STEVE MITCHELL	" " " "	SMitchell@HATTSBURGMs.com	601-545-1008
Grant Hubbard	308 Newman H'burg	gshubbard@hobbiesburgms.com	5415-6221
Chad E Johnson	1202 S 34th Ave, 34402	cejohnso@chstrust.net	917 932 4262
COLTON HILL	1202 JAMES ST	chill@hobbiesburgms.com	601-606-8522
Paul G Sheffield	4080 Hwy 11s. Hattiesburg	paul@forrestec.com	601-606-6150
Tom Baker	409 S 21st Ave	tbaker@hobbiesburgms.com	601-307-3802
ANA JAMES	PO Box 1898 H'burg	ANAJAMES@HATTSBURGMs.com	601-297-8903
Myron Lott	2311 Meigs St. 39402	mloft@hobbiesburgms.com	601-596-4032
Andy Sims	300 Klondyke St 39401	hsims@hobbiesburgms.com	601-545-4945
JAMES RUSSELL	2310 Clayton Pl. 39402	arlynearnix.net	601-543-3519
Wilma Adams	404 Bowie St.	wadams9747@gmail.com	704-771-2989
Melvin Williams	422 Mobile St	twm@luckyadco.com	601-447-1020
Paul Sims	501 Bay St.	Paul@Insured.ms	601 906 5026
Madijah Muhammad	107 William	Muhammad@hobbiesburgms.com	601-596-2994
ROSS BELL	65 Waterford Dr.	Ross.Bell@BASTI.com	601-408-7744

See next page for additional members Signatures



Minutes: 7-19-2018 Meeting

Nick – Planning Dept

Lisa – Consultant

Assessing the Hazards

1. Reviewing City of Hattiesburg Flood Zone Maps
 - a. Color Coding explanations. See handout from Meeting. (See Repetitive Loss Locations Map)

*Repetitive Loss Locations can be removed from the repetitive loss list with continued documentation of the area.

Where's The Hazard?

1. **Nick recorded individual addresses for official use. See his list.
2. Lisa/Nick will map and review all other submissions.

Moving Forward.

1. Itemized Evaluation will be performed on each location listed.
 - a. Maintenance Issues to Address.
 - b. Major Budgetary Items to repair.
2. Updating Flooding History in FPM
Updated information will be added to our packets
Nick will provide updated maps w/ overlays once new information is processed.

Committee Homework.

- Continue to collect Flooding Questionnaire information.
- Review properties for flooding causes (more staffing than committee).
- Continue Reading Section 500. Pgs 510-16 through 510-18.



FLOODPLAIN MANAGEMENT PLANNING COMMITTEE

Meeting 4 - August 30, 2018

Train Depot Conference Room

4:00 – 5:30

1. Call to Order
2. Prayer
3. Minutes
4. Review Possible Goals and Activities
5. Next Meeting September 13, 2018
6. Questions/Answers
7. Adjourn



FLOODPLAIN MANAGEMENT PLANNING COMMITTEE

Meeting 3 - August 2, 2018

Train Depot Conference Room

4:00 – 5:30

1. Call to Order
2. Prayer
3. Minutes
4. Summarize Special Flood Hazard Areas (SFHA) Problems

An overall summary of the jurisdiction's vulnerability to each hazard identified in the hazard assessment and the impact on the community (include a description of the impact of flooding and what kinds of problems arise);

- b. A description of the impact that the hazards identified in the hazard assessment have on the features listed below:
 - Life safety and the need for warning and evacuating;
 - Public health, including health hazards from flood waters and mold;
 - Critical facilities and infrastructure;
 - Community's economy and major employers; and
 - Number and types of affected buildings (e.g., residential, commercial, industrial). The assessment must include an inventory of all buildings owned by the community located in flood-prone areas and identifies which buildings are insured for flood damage.
- c. The assessment should include a review of:
 - Historical damage to buildings;
 - All repetitive loss properties;
 - All properties that have received flood insurance claims payments (potential damage and dollar losses) natural functions, (such as wetlands, riparian areas, sensitive areas, and habitat for rare/endangered species);
 - Description of development, redevelopment, and population trends and a discussion of what the future brings for development and redevelopment in the community, the watershed, and natural resource areas; and
 - Description of the impact of the future flooding conditions on people, property, and natural floodplain functions.

5. Eliminating August 16th Meeting
6. Review of Assignment for Meeting 4 on August 30th
 - Setting Goals
7. Questions/Answers
8. Adjourn

Flood Zone	Description/Address	Type of Flooding Source: Creek/River, Drainage, Erosion, Flash, Repetitive Loss, Street
ae	N 19 th and Pearl (silt, garbage)	Possible drainage
	Intersection of 8 th and Whitney	Possible drainage
	Intersection of S. Haven and Oakley	
	Intersection of S 13 th and Concart	Possible drainage
	Both sides of Hardy East of 49	
	Couple of houses on Corrine	
	W Pine St south of 2 nd and 4 th Ave	
	Mobile St. (between railroad tracks and Jackson)	
	Bay St. (South towards Hall)	
	Intersection of 49 and Pine	Possible drainage (pumps provided by MDOT)
	Intersection of 7 th and 49	Possible drainage (pumps provided by MDOT)
	Klondyke St. by E. Hardy	

Flood Zone	Description/Address	Type of Flooding Source: Creek/River, Drainage, Erosion, Flash, Repetitive Loss, Street
	Corner of Clayton Place and Marie	Possible drainage (appears to go towards Walmart)
	Pine St.	Possible
	Corner of Bouie and 7th St.	Possible Drainage
	100 Coit St.	RL
	800 block of New Orleans St	RL
	Corner of 42 and Mobile St.	
	Jones School	
	4th and 5th (ditches)	
	149 E 10th St.	RL
	Between Southern Ave and Bay	
	Rowan (water damage – 2 -3")	Possible Drainage

Flood Zone	Description/Address	Type of Flooding Source: Creek/River, Drainage, Erosion, Flash, Repetitive Loss, Street
	Briarfield St. and Ryan St. Homes	Flash Flooding
	Robertson place (Bldg. A, J, K)	
	Intersection of John St. and Katie (by D bldg.)	
	Raphael (from citizen)	
	Univ Campus (N 31 st and Pearl)	
	Main St and Mcleod	
	1208 Coit St	Ditch & River/Leaf Bouie
	900 Coit St	River
	149 E 10 th St	Creek/River
	44 Alex Ln	

Flood Zone	Description/Address	Type of Flooding Source: Creek/River, Drainage, Erosion, Flash, Repetitive Loss, Street
	107 William St.	
	3304 Luper Drive	
	105 Burketts Creek Dr.	
	6008 Hwy 49	
	422 S 15 th Ave	
	101 Griffith Road	
	200 Concart St.	
	3707 Azalea Dr.	
	208 Gordon St	River
	2907 Glenn Dr	

Flood Zone	Description/Address	Type of Flooding Source: Creek/River, Drainage, Erosion, Flash, Repetitive Loss, Street
	22 Troon Cir	
	207 S 24 th Ave	
	316 W 7 th St	
	1909 Fuller St	
	204 Greenwood Place	
	303 Mandalay Dr	
	503 S 21 st Ave	Creek/Drainage Ditch
	Gordon's Creek to prevent erosion and flooding needs to be addressed in the section that runs parallel with both Lincoln Road and Sunset Drive between S. 28th Avenue and Broadway Drive	Erosion and Flooding
	include Corinne Street between Broadway Drive and Hardy Street, particularly the intersection of 5th Avenue and Corinne Street as well as the drainage ditches that run parallel with W. Pine Street and Corinne Street	Drainage ditch

Flood Zone	Description/Address	Type of Flooding Source: Creek/River, Drainage, Erosion, Flash, Repetitive Loss, Street
	Hardy St. - between S. 17th Avenue and Mamie Street (on the outside lane of the southside)	Flash Flooding
	Intersection of S. 13th Avenue and Concart Street	Drainage
	Dead End Alley between 12 th and 13 th	Knee Deep Flooding
	Area around Kamper Park/Gordon's Creek/Hardy St.	Storm Drains Overflow
	Bad spot at W Arlington and S 29 th	Storm Drains?
	501 S 21 st Ave.	Yard Flooding
	Jones School/	RL – Severe Flooding
	Atlanta/Mobile St.	Severe Flooding
	Yard Flooding	
	Dam Inuadation Areas subject to flooding	

FPM Meeting Minutes 8-2-2018 - Assessing the Problem

1. Reviewed Draft Map of known flood hazard areas, to ensure all questionnaire responses had been properly identified.
2. Hazard Mitigation Plan **(will be emailed to board members)**

This is a comprehensive response plan for a number of possible disasters. It addresses everything from Flooding to Terrorism to Wildfires. For our Floodplain Management Program we will be updating and improving the existing plan, originally created in 1999, and the current Hazard Mitigation Plan. Upon completion we will be merging the 2 plans into one for future use and updating.
3. Summarized Vulnerabilities.
 - A. Flood History.
 - i. Historical Repetitive Loss information is pulled from FEMA and the NFIP to determine areas that have historically had problems.
 - ii. The areas we identified as problems in previous meetings.
 - B. Life Safety Issues.
 - i. Keeping safe during event, and proper precautions, permitting for re-building, etc. during cleanup
 - C. Infrastructure - Road Damage
 - i. Emergency and Non-Emergency Travel.
 - a. Ambulance
 - b. Police
 - c. Fire
 - d. Road/Electrical Crews
 - e. Repair Personnel
 - f. Moving general public getting out of harms way, especially those with disabilities and getting school children home to their families
 - g. Emergency and Non-Emergency business impacted from damaged infrastructure
 - ii. Critical Facilities and Repair.
 - D. Public Health
 - i. Flood Waters (standing)
 - ii. Mold
 - iii. Debris
 - E. Economic Impacts
 - i. Employees getting to and from work
 - ii. Business closed due to damage

- F. Crime
 - i. Emergency Response limited in affected areas.
- 4. Number and Types of Properties Affected
 - A. Inventory buildings in repetitive loss area, including properties prone to flooding that are not in high risk flood zones.
 - i. Some of this work has been done. Please continue to add to this.
 - ii. Repetitive Loss buyouts. - Federal Money is available for communities to buy and remove repetitive loss properties, but restrictions apply as to the future use of these properties, such as parks/greenspace.

HOMEWORK ASSIGNMENT

Brainstorming Session for next Meeting – we will be considering mitigation actions and setting goals. Idea examples:

- Improve Drainage
- Raising Elevation requirements for new construction
- River Maintenance
- All ideas and suggestions welcome.

Please continue to distribute the Flooding Questionnaire and have completed forms turned in.

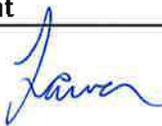
Online Link - <http://www.hattiesburgms.com/residents/flood-information/>

8-16-2018 Meeting is Cancelled, as Nick will be in CRS Training. We will meet as usual on 8-30-2018.

AUGUST 1, 2018 - FMP COMMITTEE MEETING

Member Name	Member Phone	Signature of Attendance
Street Address	E-Mail	
City, State, Zip	Lives in Ward	
Committee Status		
Adams, Wilma 404 Bouie Street Hattiesburg, MS 39401	704-771-2989 Wjadams9747@gmail.com Ward: _____ Serving as: Citizen	
Barker, Toby 409 South 21st Avenue Hattiesburg, MS 39401	601-307-3802 tbarker@hattiesburgms.com Ward: 4 Serving as: Mayor / FMP Chair	
Bell, Ross 65 Waterford Drive Hattiesburg, MS 39402	601-408-7744 Ross.bell@bxst.com Ward: _____ Serving as: Stakeholder - BXS Ins.	
Burns, Dawn 652 North Slade _____, MS 39482	601-545-4681 dburns@hattiesburgms.com Ward: _____ Serving as: Citizen	
Delgado, Deborah 304 Williams Street Hattiesburg, MS 39401	225-521-0656 dldenard@aol.com Ward: 2 Serving as: City Councilwoman	
Edmonson, Chad 1202 South 34th Avenue Hattiesburg, MS 39402	917-952-4262 cedmonson@hotmail.com Ward: 3 Serving as: Citizen	
Gopalan, Hema/Grant Hobgood 308 Newman Street Hattiesburg, MS 39402	601-545-6220 / 545-6221 hgopalan@hattiesburgms.com ghobgood@hattiesburgms.com Ward: ____ / ____ Serving as: Staff - GIS Dept	
Hasan, Nadir 1040 Spanish Trail, Suite 10 Hattiesburg, MS 39401	678-953-0703 nadirhasan215@gmail.com Ward: _____ Serving as: Citizen (Twin Forks)	
Heath, Margaret / Judy Mellard P O Box 832 Hattiesburg, MS 39401	601-583-1881 mheath@hattiesburgha.com Ward: 2 / ____ Serving as: Stakeholder - Housing Authority	
Hill, Colton 1202 James Street Hattiesburg, MS 39401	601-606-8522 chill@hattiesburgms.com Ward: _____ Serving as: Staff - Public Works	

AUGUST 1, 2018 - FMP COMMITTEE MEETING

Member Name	Member Phone	Signature of Attendance
Street Address	E-Mail	
City, State, Zip	Lives in Ward	
Committee Status		
Jones, Ann 1100 North 31st Avenue Hattiesburg, MS 39401	601-297-8903 annjones@hattiesburgms.com Ward: ____ Serving as: Staff: Administration	
Lott, Myron 2311 McInnis Street Hattiesburg, MS 39402	601-596-4032 mlott@hattiesburgms.com Ward: <u>4</u> Serving as:	
Mitchell, Steve P O Box 1898 Hattiesburg, MS 39401	601-545-1008 smitchell@hattiesburgms.com Ward: 3 Serving as: Building Official	
Muhammad, Khadijah P O Box 1898 Hattiesburg, MS 39401	601-596-2992 kmuhammad@hattiesburgms.com Ward: ____ Serving as: Staff: Municipal Court	
Parker, Andy P O Box 1898 Hattiesburg, MS 39401	601-545-1541 aparker@hattiesburgms.com Ward: ____ Serving as: Parks/Recreation	
Reid, Lisa 807 Hillendale Drive Hattiesburg, MS 39402	601-520-9158 Johnnyreid807@hattiesburgms.com Ward: 3 Serving as: Staff - CRS Consultant	
Rutland, Lamar 3202 Prince George Hattiesburg, MS 39401	601-545-4540 lrutland@hattiesburgms.com Ward: 3 Serving as: Staff - City Engineer	
Scott, Rev. Joseph 1403 Rebecca Avenue Hattiesburg, MS 39401	601-297-1947 none Ward: 2 Serving as: Citizen	
Sheffield, Paul 4080 Highway 11 South Hattiesburg, MS 39401	601-606-5150 paul@forresteoc.com Ward: ____ Serving as: Stakeholder - Emergency Management	
Sims, Hardy 300 Klondyke Street Hattiesburg, MS 39401	601-545-4945 hsims@hattiesburgms.com Ward: ____ Serving as: Staff - Police Dept	

AUGUST 1, 2018 - FMP COMMITTEE MEETING

Member Name	Member Phone	Signature of Attendance
Street Address	E-Mail	
City, State, Zip	Lives in Ward	
Committee Status		
Sims, Paul 501 Bay Street Hattiesburg, MS 39401	601-906-5026 paul@insured.ms Ward: ____ Serving as: Stakeholder - Insurance	
Trussell, James 2310 Clayton Place Hattiesburg, MS 39401	601-543-3519 arllyn@ayrix.net Ward: 4 Serving as: Citizen	
Williams, Melvin 422 Mobile Street Hattiesburg, MS 39401	601-447-7102 tonslucky@aol.com Ward: 2 Serving as: Citizen	
Williams, Nick P O Box 1898 Hattiesburg, MS 39401	601-554-1019 nwilliams@hattiesburgms.com Ward: ____ Serving as: Staff-CRS Coordinator/Planning	
Wingo, Petra 601 East Pine Street Hattiesburg, MS 39401	601-466-7421 pjwingo@outlook.com Ward: ____ Serving as: Citizen (Twin Forks)	

Jennifer Shows
P.O. Box 1898
Hattiesburg, MS 39401

601-545-41544
jshows@hattiesburgms.com
Grant Coordinator

Jennifer Shows

Samantha McLean
~~Robert McLean~~
130 Baywood Cr.
Hattiesburg, MS
39401

~~601-545-4508~~ 601-545-4508
Serving as - Staff
Ward 3

AUGUST 2, 2018 - FMP COMMITTEE MEETING

Member Name	Member Phone	Signature of Attendance
Street Address	E-Mail	
City, State, Zip	Lives in Ward	
Committee Status		
Adams, Wilma 404 Bouie Street Hattiesburg, MS 39401	704-771-2989 Wjadams9747@gmail.com Ward: ____ Serving as: Citizen	
Barker, Toby 409 South 21st Avenue Hattiesburg, MS 39401	601-307-3802 tbarker@hattiesburgms.com Ward: 4 Serving as: Mayor / FMP Chair	
Bell, Ross 65 Waterford Drive Hattiesburg, MS 39402	601-408-7744 Ross.bell@bxst.com Ward: ____ Serving as: Stakeholder - BXS Ins.	
Burns, Dawn 652 North Side 220 W Front St Hattiesburg, MS 39482	601-545-4681 dburns@hattiesburgms.com Ward: ____ ^{staff} Serving as: Citizen - Acct Dept	
Delgado, Deborah 304 Williams Street Hattiesburg, MS 39401	225-521-0656 dldenard@aol.com Ward: 2 Serving as: City Councilwoman	
Monson, Chad 1202 South 34th Avenue Hattiesburg, MS 39402	917-952-4262 cedmonson@hotmail.com Ward: 3 Serving as: Citizen	
Gopalan, Hema/Grant Hobgood 308 Newman Street Hattiesburg, MS 39402	601-545-6220 / 545-6221 hgopalan@hattiesburgms.com ghobgood@hattiesburgms.com Ward: ____ / ____ Serving as: Staff - GIS Dept	
Hasan, Nadir 1040 Spanish Trail, Suite 10 Hattiesburg, MS 39401	678-953-0703 nadirhasan215@gmail.com Ward: ____ Serving as: Citizen (Twin Forks)	
Heath, Margaret / Judy Mellard P O Box 832 Hattiesburg, MS 39401	601-583-1881 mheath@hattiesburgha.com Ward: ____ / ____ Serving as: Stakeholder - Housing Authority	
Hill, Colton 1202 James Street Hattiesburg, MS 39401	601-606-8522 chill@hattiesburgms.com Ward: ____ Serving as: Staff - Public Works	

AUGUST 1, 2018 - FMP COMMITTEE MEETING

Member Name	Member Phone	Signature of Attendance
Street Address	E-Mail	
City, State, Zip	Lives in Ward	
Committee Status		
Jones, Ann 1100 North 31st Avenue Hattiesburg, MS 39401	601-297-8903 annjones@hattiesburgms.com Ward: ____ Serving as: Staff: Administration	
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FLOODPLAIN MANAGEMENT PLANNING COMMITTEE

Meeting 4 - August 30, 2018

Train Depot Conference Room

4:00 – 5:30

1. Call to Order
2. Prayer
3. Minutes
4. Review Possible Goals and Activities
5. Next Meeting September 13, 2018
6. Questions/Answers
7. Adjourn



STATE OUR
GOALS
Of the HMP
and FMP

A GOAL
WITHOUT
A PLAN
IS JUST
A WISH



REVIEWING POSSIBLE ACTIVITIES

Review Preventive Activities

such as zoning and land use ordinances, floodplain management regulations, storm water management regulations, building codes, subdivision ordinance, preservation of open space, comprehensive plans and the effectiveness of current regulatory and preventive standards and programs that could prevent or reduce the severity of the problems identified in the Problem Assessment.

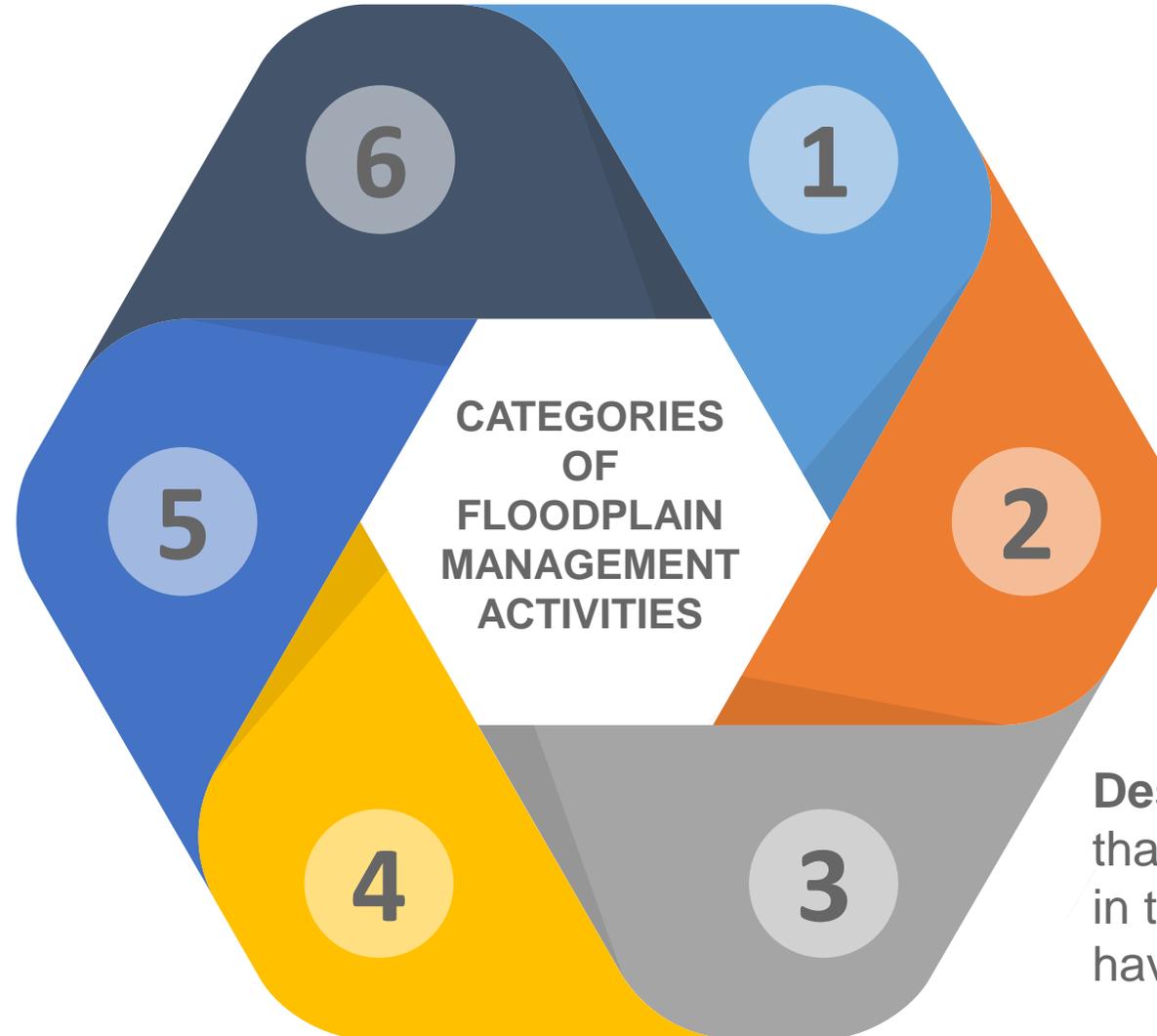
Review should include:

- ▶ How these tools can reduce future flood losses;
- ▶ The current standards in the community's plans and regulations;
- ▶ Whether the community should adopt or revise such plans and regulations;



REVIEWING POSSIBLE ACTIVITIES

1. Preventive
2. Property Protection
3. Natural Resource Protection
4. Emergency Services
5. Structural Projects
6. Public Information



Describe the Impact that the hazards identified in the hazard assessment have



REVIEWING POSSIBLE ACTIVITIES

Fully describe all activities considered

and the discussion of why the activity is or is not appropriate for the community and its flood problems

Is it appropriate and/or feasible?

- ▶ The Community's capability to fund and implement the activity;
- ▶ For all currently implemented activities, the plan must note if the activity is achieving expectations and, if not, whether it should be modified; and
- ▶ If the plan is an update of a previously credited plan, each activity recommended by the previous plan must be discussed; along with the status of implementation.



PREVENTATIVE GOALS

Overall Summary

Preventative activities keep flood problems from getting worse. The use and development of flood-prone areas is limited through planning, land acquisition, or regulation. They are usually administered by building, zoning, planning, and/or code enforcement offices.

Example

- ▶ *420 – Open Space Preservation. If/when the city acquires and/or assembles property, consider a policy for a percentage that is to be set aside as perpetual open space. Use deed restrictions to ensure its perpetual.*



PREVENTATIVE GOALS

- Floodplain mapping and data
- Planning and zoning
- Open space preservation
- Stormwater management
- Floodplain regulations
- Drainage system maintenance
- Erosion setbacks
- Building codes

**ACCORDING TO THE CRS
COORDINATOR'S MANUAL,
FEMA PROVIDES ACTIVITY
RECOMMENDATIONS THAT
CORRESPOND TO EACH
CATEGORY.**



PREVENTATIVE GOALS

Floodplain mapping and data

Outdated mapping hinders sound floodplain management

BACKGROUND

Development regulations need thorough and accurate mapping of Special Flood Hazard Areas (SFHAs) and related flood hazard data. Most communities in the National Flood Insurance Program (NFIP) have a Flood Insurance Rate Map (FIRM) provided by the Federal Emergency Management Agency (FEMA). Most FIRMs have detailed data but some communities still have flood problem areas for which detailed data were not provided by FEMA. As a result, new development in those areas is often not well-protected from flood damage.



PREVENTATIVE GOALS

Floodplain mapping and data

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
See if maybe EMD/NOAA has more info or just use Inundation Maps	Provide Flood Depth Data			
Show past flooding, high-water marks or repetitive loss areas (include dates, injuries, warning times)	Provide Historical Flood Information			
add layer for designated wetlands (USGS? Map) or critical habitat areas	Provide Natural floodplain functions			
Use EC forms data to add this layer	Show base flood elevations and Additional Map Data: building elevation data			
we have pictures of oldest ones taken at McCain Library where archived and stored; and latest 2 or 3 are stored in Planning and Engineering (Jerald has) Offices - could possibly add as layers, ask Hema what kind of time this would take, may not be worth 6 points	Additional Map Data: old FIRM's			
update and map repetitive loss areas	Additional Map Data: other regulations			
update and map wetlands and area near Currie St/E Hardy St if we designate as Natural area restoration	Additional Map Data: Natural floodplain functions			
Get old info on file and w/ Eng. to determine if we have any that qualify	Benchmark maintenance			



PREVENTATIVE GOALS

Planning and Zoning

Must have a zoning ordinance that identifies different development criteria and densities for different areas

There is additional credit for low density zoning in areas subject to special flood-related hazards.

Credit is provided for zoning areas of the regulatory floodplain to keep them substantially open. Zoning an area for agriculture, conservation, or large residential lots preserves more open space than allowing more intensive development.

LZ credit is available for undeveloped land within low-density zoning districts, as well as for areas developed in accordance with the density requirements within the regulatory floodplain. “Low-density” means that that size of the lots is at least 5 acres. For this element, it does not matter why an area is zoned for low density; what counts is the minimum lot size and lot coverage allowed in the zoning district.

The credit for low-density zoning is based upon the traditional zoning approach of setting minimum lot sizes for different zoning districts. The bigger the lot size, the less dense the floodplain development and the more credit provided. The credit also factors in lot coverage for non-residential zones.

BACKGROUND



PREVENTATIVE GOALS

Planning and Zoning

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
ongoing - verify ord lot sizes - provides credit for zoning areas of the SFHA to keep them substantially open (examples: A-1 and A-2 zoning) based on ratio of lot size in ordinance x 60 + impact adjustment	Low-density zoning			
Amend LDC to require an evacuation plan for new residential subdivisions that exceed a certain number of units/street (designate number of minimum units)	Other Higher Standard			
city must require that erosion/sediment control measures be taken on land disturbed during development, based on size of area and applied to all construction sites - including construction of bldgs., road's etc.	Erosion and sedimentation control regulations			
city must implement best management practices to protect water quality and regulations must specify one or more measures or refer to BMP's as published in an official government reference	Water quality regulations			



PREVENTATIVE GOALS

Open Space Preservation

Prevent flood damage by keeping flood-prone lands free of development, and Protect and enhance the natural functions of floodplains.

BACKGROUND

Floods are natural processes and floodplains are necessary to every river and coastal system. A floodplain has been defined as any land susceptible to being inundated by flood waters. Floodplains can also be regarded as the land needed by a river or stream to convey and store flood waters or the coastal areas subject to inundation during a storm.

Preserving the floodplain as open space allows it to serve these primary natural functions and many other important functions. Keeping the floodplain free of development—free of buildings and infrastructure—means that there will be no flood insurance claims, no closed businesses, no homeless residents, no damaged infrastructure, and that the community can return to normal quickly after flooding occurs.



PREVENTATIVE GOALS

Open Space Preservation

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
Verify/Maintain our 2009 submitted info				



PREVENTATIVE GOALS

Stormwater Management

Prevent future development from increasing flood hazards to existing development, to protecting existing hydrologic functions within the watershed, and to maintain and improve water quality.

Because development typically results in an increase in the amount of runoff, stormwater management usually requires that a volume of flood water be stored onsite during the storm to prevent increased frequency and severity of flooding. It is released after the runoff subsides (stormwater DETENTION). A developer may store this excess runoff for a short time so that it may be used for irrigation or groundwater recharge or to reduce pollution (stormwater RETENTION). When retention is used for stormwater management, the retained runoff is not discharged to the stream system.

BACKGROUND

Detention does not reduce the amount of water flowing downstream; rather, it simply lets it out over a longer period of time to reduce the peak flow immediately downstream of the site. This can still cause flooding problems farther downstream and the additional volume of water can destabilize channel banks and cause other problems. Therefore, stormwater retention or extended detention is preferable to simple detention for peak flows. If stormwater retention is used, the community must ensure that adequate storage is again available within a reasonable time in case another storm occurs.



PREVENTATIVE GOALS

Stormwater Management

Prevent future development from increasing flood hazards to existing development, to protecting existing hydrologic functions within the watershed, and to maintain and improve water quality.

Other approaches, such as low-impact development regulations, can be used to reduce the total runoff that leaves a site as well as peak flows. These techniques help preserve a site's ability to absorb its runoff. Credit may be provided for other approaches to managing the impact of development on runoff, if the community can show that there is no increase in flood risk or erosion downstream.

BACKGROUND

Maintenance of these required facilities is vital—if they silt in or become clogged, they provide no flood protection benefits. Therefore, there are separate credits under Activity 540 for maintaining storage facilities. SMR credit is the sum of the credit for four sub-elements:

- Size of development (Section 452.a(1), SZ),
- Design storm used (Section 452.a(2), DS),
- Low-impact development regulations (Section 452.a(3), LID), and
- Public agency authority to inspect and maintain, at the owner's expense, private facilities constructed to comply with the ordinance (Section 452.a(4), PUB).

Communities are encouraged to check with their regional stormwater management agency to see if they can apply for credit based on the stormwater management program implemented by the regional agency.



PREVENTATIVE GOALS

Stormwater Management

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
Consider amending our ord for new development to prevent/reduce the increase in runoff that results from urbanization from 10-year storm or larger.	Prevent/reduce the increase in runoff for new development		Additional credit is available if the community addresses larger storms, and controls the total volume of runoff from new development, and broken down into 4 categories below (must have SZ and DS credit to receive any credit for SMR):	Must have watershed map w/total areas and calculate the area of watershed and area subject to regulations (portion in City limits for example) is part of the impact adjustment for this activity
Consider amending our Ord. to add regulations that clearly state ALL development is subject to regulations (prorated if only some types or sizes of development are regulated)	Size of Development regulated			
Consider amending - Max credit if regulations clearly state that all discharges up to and including that from the 100-yr storm must be released at rates not exceeding the pre-development peak discharge - credit is for what size storm detention is designed for and additional credit if the volume is also controlled	Design Storms used in regulations		bonus credit for controlling the volume of runoff if regulations require retention of all runoff or if the total volume of water released, measured above half of the 2-year flow rate is no more than the pre-development volume	



PREVENTATIVE GOALS

Stormwater Management

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
Consider amending our ord to encourage "Green infrastructure" practices or Stormwater Management Plan that requires use of "soft" techniques	Low-impact development			
Establish and enforce maintenance procedures and City having authority to inspect, perform maintenance should owners not comply	Public maintenance of required facilities			
Manage the runoff from "all storms" up to and including the 100-yr event to ensure that flood flows downstream of new development do not increase due to the development	Watershed Master Plan: Manage all storms up to and including the 100 year			
Provide onsite management of future peak flows and volumes so that they do not increase over present values	Watershed Master Plan: Management of future peak flows and volumes			
Manage the runoff from "all storms" up to and including the 5-day event	Watershed Master Plan: Manage all storms up to and including the 5-day event			
Community has a funding source dedicated to implementing the plan's recommendations	Watershed Master Plan: Dedicated funding source to implement the plan			



PREVENTATIVE GOALS

Stormwater Management

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
Consider amending Stormwater Ordinance to add a Watershed Master Plan as broken down in WMP1-8 and all the requirements here: must have stormwater regulations through an adopted watershed master plan that evaluates the impact of future conditions for at least one watershed that drains into the community for multiple storm events, including the 100-yr storm; must identify the natural drainage system and constructed channels; must have adopted regulatory standards that require onsite management of runoff from all storms up to and including the 25-yr event that receive credit under SMR and manage future peak flows; "all storms" includes at a min. the 10-yr storm in addition to 25 yr. event; management of a 2-yr storm is recommended; plan must be current (within 5 yrs.) or City must evaluate the plan to ensure still applicable to current conditions	Watershed Master Plan: Plan meets all the criteria listed in Sec 452.b			



PREVENTATIVE GOALS

Floodplain Regulations

Protect existing and future development and natural floodplain functions that exceed the minimum criteria of the National Flood Insurance Program (NFIP).

Although the NFIP minimum standards provide a great deal of flood protection, damage can still result for many reasons:

- Estimates of flood heights are subject to various errors;
- Changes in weather patterns may alter floodheights;
- Buildings may be damaged by floods that exceed the predicted 100-year flood;
- Urbanization and other changes in the watershed can increase the flood hazard and flood frequency;
- Filling and other development in the floodplain can reduce storage and conveyance capacity, increasing flood hazards; and
- Filling and construction practices can damage or destroy valuable natural floodplain functions. For these reasons, and the fact that local situations vary, many communities adopt development standards that are higher than or supplement the minimum NFIP criteria. This activity provides credit for those regulatory standards.

BACKGROUND



PREVENTATIVE GOALS

Floodplain Regulations

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
ongoing, but need to update "Known Flood Hazard Map" based on FMP input in step 4 and possibly regulate as if in a special flood hazard area, requiring freeboard elevation - if so, send to FEMA for map amendment, adding these areas to the SFHA?	Other flood problems not shown on the FIRM/ Other Higher Standard/Higher Study Standard			
Amend LDC and/or Flood Prevention Ordinance requiring all structures in a new Flood Inundation Area (established on State/Fed Permits) to be elevated to established Freeboard; map area and possibly submit to FEMA for map amendment OR just allow for "cluster" development whereby the inundation area stays green and allows the structures to be placed in/around but not in danger area	New Study/Higher study standards/Other Higher Standard/Open Space Incentive			
Amend LDC and/or Flood Prevention Ordinance to require new subdivisions with a dam to meet all the State and Federal requirements/obtain permits prior to local permitting.	Higher study standards or Other Higher Standard			



PREVENTATIVE GOALS

Floodplain Regulations

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
Amend Flood Prevention Ordinance to prohibit floodproofing as a flood protection measure for ALL new buildings (we currently allow for commercial structures) (means all residential and commercial structures in a SFHA would have to be elevated to established freeboard)	Other Higher Standard			
Long Shot - would need ordinance language that prohibits fill; however, gives approx. 1/2 credit if developer provides compensatory storage which might be a good compromise?	Prohibition of fill			
Don't recommend at this time - Twin Forks development would be out if we adopted ordinance language that prohibits building	Prohibition of buildings			



PREVENTATIVE GOALS

Drainage System Maintenance

Keeping our streams, channels, and storage basins clear of debris so that flood carrying and storage capacity are maintained

BACKGROUND

A community's drainage system consists of natural watercourses or channels; constructed storm drains, canals, and ditches; and detention/retention basins built to store high flows. In most cases, the actual channel of a natural stream will carry only the two-year flood, with larger flows being carried in the overbank area. Constructed channels are typically designed to carry larger floods than natural channels do, and communities usually have an active maintenance program for their constructed facilities. When a channel loses a portion of its conveyance capacity, overbank flooding occurs more frequently and flows reach higher elevations, potentially damaging nearby structures or causing increased channel erosion.

Even where floodplain regulations prevent construction from encroaching, streams can lose their carrying capacities as a result of the accumulation of debris, sedimentation, and the growth of unwanted vegetation. Detention and retention basins can lose their ability to store water if upstream sediment controls do not function properly or if there are highly erosive lands upstream.

One proven approach to preventing this reduction of capacity is a community program that routinely inspects and clears debris from the channels and basins. This work can be as simple as cleaning out culverts and removing trash, shopping carts, and similar debris that can dam a stream and cause flooding, even during small storms.



PREVENTATIVE GOALS

Drainage System Maintenance

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
ongoing, but need to improve maintenance schedule	Channel Debris Removal			
Inventory and map all channels in SFHA (or City-wide?), all USGS quadrangle and draining more than 40 contributing acres; large underground segments of the surface conveyance system need to be shown if they convey flow from a natural channel; on the map and inventory segments, portions or components of natural conveyance system must be identified; identify owner (city, state, private); and who inspects and maintains each segment	Channel Debris Removal			
ongoing, but need to improve maintenance schedule	Stream dumping regulations			
Check ordinance for possible updating/amending to ensure regulation not only prohibits but allows for enforcement throughout drainage system	Stream dumping regulations			
Update Resolution to ensure it designates a person responsible for complaints/monitoring/compliance and enforcement and abatement provisions	Stream dumping regulations			
Inventory and Map problem site maintenance locations (ex. "choke" points, chronic dumping, obstruction of flows or erosion/sedimentation problems , etc.) in all channels in SFHA (or City wide?)- set up more frequent inspections for better maintenance of these areas and identify in resolution	Problem site maintenance			



PROPERTY PROTECTION GOALS

Overall Summary

Property Protection activities are usually undertaken by property owners on a building-by-building or parcel basis.

Example

- ▶ *420 – Open Space Preservation. If/when the city acquires and/or assembles property, consider a policy for a percentage that is to be set aside as perpetual open space. Use deed restrictions to ensure its perpetual.*



PROPERTY PROTECTION GOALS

- Relocation
- Retrofitting
- Acquisition
- Sewer backup protection
- Building elevation
- Insurance



PROPERTY PROTECTION GOALS

Acquisition and Relocation

The Federal Emergency Management Agency (FEMA) administers three grant programs to assist communities in mitigating the effects of natural hazards: the Flood Mitigation Assistance (FMA) Program, the Hazard Mitigation Grant Program (HMGP), and the Pre-Disaster Mitigation (PDM) grant program.

BACKGROUND

Acquisition and relocation projects remove people and property from harm's way and reduce the community's costs for disaster response, recovery, and repair. The Federal Emergency Management Agency (FEMA) recognizes that the acquisition of buildings in the floodplain is especially effective at reducing flood losses because it is a permanent form of mitigation. Other government agencies also have found acquisition projects to be more cost effective than major flood control projects.

Acquisition and relocation (or demolition) of buildings also creates additional open space in the floodplain and allows those lands to return to their natural functions. Acquisition is the most effective mitigation alternative for addressing repetitive loss properties.



PROPERTY PROTECTION GOALS

Acquisition and Relocation

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
detailed mitigation plan for RL area, specific guidance on how to reduce damage; see if any have been mitigated/removed; must address every address in the RL area; area mapped; contact other agencies for input, visit each building and collect basic data - drainage patterns, condition of structure, types of foundation; historic flood info; date of bldgs. ins claim and source of flooding; RLAA info must be adopted by Council separately	Repetitive loss area analysis			



PROPERTY PROTECTION GOALS

Retrofitting

Protect buildings from flood damage by

- *Retrofitting the buildings so that they suffer no or minimal damage when flooded, and/or*
- *Constructing small flood control projects that reduce the risk of flood waters' reaching the buildings.*

Existing buildings can be protected on site, especially from shallow, slow-moving flood waters, by implementing one or more flood protection techniques.

This activity provides credit for buildings located in the floodplain that have been protected from flood damage by being retrofitted or by the placement of certain types of flood control structures that protect building(s) to at least the 25-year flood level.

BACKGROUND

Retrofitting projects, such as

- o Elevating buildings above predicted flood levels,

- o Dry floodproofing,

- o Wet floodproofing,

- o Protecting basements from sewer backup, and

- o Barriers (for individual structures only), including levees, berms, and floodwalls.



PROPERTY PROTECTION GOALS

Retrofitting

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS



PROPERTY PROTECTION GOALS

Sewer Backup Protection

Don't let clogged sewers wreak havoc on your home

BACKGROUND

Most homeowners may not realize that they are responsible for the maintenance and repair of their house or sewer lateral—that is, the pipeline between the city sanitary sewer main (which is usually located in the street) and the building.

The sewer lateral is owned and maintained by the property owner and the homeowners responsibility includes any part of the lateral that extends into the street or public right of way. A cracked or deteriorated lateral or one filled with tree roots can allow groundwater to seep into the system, contributing to the problem.

For homeowners who want to insure themselves against sewer backups, coverage is available from most providers for a nominal cost.



PROPERTY PROTECTION GOALS

Sewer Backup Protection

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS



PROPERTY PROTECTION GOALS

Building Elevation

Freeboards are several pillars under a home that elevate it higher than the legally mandated height requirement

BACKGROUND

The NFIP requires that the lowest floor of residential structures be elevated to or above the base flood elevation and that non-residential structures be elevated or floodproofed to or above the base flood elevation. Attached garages and utilities (including electrical, heating, ductwork, ventilating, plumbing, and air conditioning equipment) must also be protected to the base flood elevation (44 Code of Federal Regulations (CFR) §60.3(a)(3)). This can be done by elevating them or using flood-resistant materials during construction.

A freeboard requirement adds height above the base flood elevation to provide an extra margin of protection to account for waves, debris, miscalculations, changing weather patterns, or lack of data.



PROPERTY PROTECTION GOALS

Building Elevation

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
ongoing, but need better communication between building/planning depts to ensure accuracy of EC's and structure elevation - especially at the "Building Under Construction" Level before slabs are poured	Maintaining Elevation Certificates			



NATURAL RESOURCE PROTECTION GOALS

Overall Summary

Natural Resource Protection activities preserve or restore natural areas or the natural functions of floodplain and watershed areas. They are implemented by a variety of agencies, primarily parks, recreation, or conservation agencies or organizations.

Example

- ▶ *420 – Open Space Preservation. If/when the city acquires and/or assembles property, consider a policy for a percentage that is to be set aside as perpetual open space. Use deed restrictions to ensure its perpetual.*



NATURAL RESOURCE PROTECTION GOALS

- Wetlands protection
- Water quality improvement
- Erosion and sediment control
- Coastal barrier protection
- Natural area preservation
- Environmental corridors
- Natural area restoration
- Natural functions protection



NATURAL RESOURCE PROTECTION GOALS

Wetlands Protection

Protect the natural and beneficial functions of our community's floodprone lands.

There are three reasons why preserving open spaces that support these functions warrant the additional credit available under this element.

- (1) More and more studies are showing that natural open space can be more effective at controlling or attenuating flooding and is less expensive over the long run than traditional manmade flood control structures.
- (2) Local officials and their constituents who are aware of the benefits that naturally functioning floodplains provide to their communities want to protect them. This can generate a continuous level of interest to protect floodplains in order to support local economies or improve recreational opportunities. This interest level persists between infrequent floods, adding to the attention and resources available for flood loss reduction efforts.
- (3) Disrupting natural features has adverse impacts on the flooding regime.

BACKGROUND



NATURAL RESOURCE PROTECTION GOALS

Wetlands Protection

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
additional credit if plan identifies existing wetlands or other natural open space areas to be preserved from development to that natural attenuation, retention, or detention of runoff is provided	Watershed Master Plan: Natural areas to provide retention and detention			



NATURAL RESOURCE PROTECTION GOALS

Erosion and Sediment Control

Regulating activities throughout the watershed to minimize erosion on construction sites that result could in sedimentation and water pollution.

BACKGROUND

Erosion Sedimentation Control credit is provided if the community requires that erosion and sediment control measures be taken on land that is disturbed during development. ESC credit is based upon the size of the areas subject to the regulation. Drainage systems cannot perform to their design standards if they are choked with eroded soil that has been captured in stormwater. Sediment control is especially important in watersheds where land is being disturbed by construction. Sedimentation has been called the largest source of water pollution in the country. Credit Criteria for ESC (1) To receive ESC credit, the community's regulations must apply to all construction sites within the community. An erosion and sedimentation control regulation that is part of a floodplain ordinance or a building code and does not affect

ALL construction sites in the community does not receive credit under this element. "All construction sites" in the subsections below means all sites in the community subject to construction of buildings, roads, etc., regrading, or other non-agricultural land-disturbing activity.



NATURAL RESOURCE PROTECTION GOALS

Erosion and Sediment Control

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS



NATURAL RESOURCE PROTECTION GOALS

Natural Area Preservation

Protect natural channels and shorelines

Natural channels and shorelines are the areas most valuable for protecting natural floodplain functions. They are important places for aquatic and riparian habitat. NSP credit is for allowing these areas to follow their natural processes, such as channel meandering and beach erosion, and to encourage natural shorelines that provide water quality benefits for runoff.

Note that a setback or buffer that prohibits buildings and filling can qualify as OSP but are not sufficient for NSP.

BACKGROUND

Programs to protect channels and shorelines in their natural state are credited in NSP. These include

- Regulations that govern development and construction, such as an ordinance or regulation that governs public and private construction activities; and
- Local policies followed on public lands, such as a written community policy that covers shorelines in city parks.

Protection credit is only available for channels or shorelines that are currently in their approximate natural state, i.e., there is no concrete, rip rap, levees, armoring, beach nourishment, dams, or other human intervention that constrains the natural processes of the shoreline of the river, stream, lake, or ocean.



NATURAL RESOURCE PROTECTION GOALS

Natural Area Preservation

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
additional credit if the plan recommends prohibiting development, alteration or modification of existing natural channels and the community has adopted a qualifying ordinance	Watershed Master Plan: Prohibit alteration of existing natural channels			
additional credit if the plan recommends that channel improvements use natural or "soft" approaches rather than gabions, rip rap, concrete, or other "hard" techniques, and the community has adopted appropriate design standards or ordinances	Watershed Master Plan: Projects must use natural or "Soft" approaches			



NATURAL RESOURCE PROTECTION GOALS

Environmental Corridors

Protect one or more natural functions within the community's floodplain

BACKGROUND

- A habitat conservation plan that explains and recommends actions to protect rare, threatened, or endangered aquatic or riparian species.
- A habitat protection or restoration plan that identifies critical habitat within the floodplain, actions to protect remaining habitat, and/or actions to restore fully functioning habitat. Frequently this will result in the preservation and/or restoration of riparian habitat that is necessary for water-dependent species.
- A “green infrastructure plan” that identifies open space corridors or connected networks of wetlands, woodlands, wildlife habitats, wilderness, and other areas that support native species, maintain natural ecological processes, and/or sustain air and water resources (for credit, the corridors or networks must include some floodplains).
- A plan or section of a comprehensive or other community plan that includes an inventory of the ecological attributes of the watershed and/or the floodplain and recommends appropriate actions for protecting them, provided that the recommendations are implemented through a mechanism such as a development regulation, development order, grant program, or capital improvement plan.



NATURAL RESOURCE PROTECTION GOALS

Environmental Corridors

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
Obtain inventory of all shorelines and what is natural vs hard surfaced (Hema has basic info, but we need to enhance) based on the length of shoreline affected by the natural shoreline protection regulations - setbacks and buffers do not qualify here, but do in OSP; programs that protect channels in their natural state are credited here - no concrete, rip rap, levees, etc. that constrains the natural process of the shoreline of the river, stream or lake	Natural shoreline protection			
Create and adopt a plan that protects one or more natural functions: Examples: "Green" Infrastructure Plan; or section of Comprehensive Plan that includes inventory of ecological attributes of watershed and/or floodplain, recommends actions for protecting them and implemented through a grant, capital improvement plan or development regulation/order - extra credit in 420 if plan exists	Natural floodplain functions plan			



NATURAL RESOURCE PROTECTION GOALS

Natural Area Restoration

Regulating activities throughout the watershed to minimize erosion on construction sites that result could in sedimentation and water pollution.

BACKGROUND



NATURAL RESOURCE PROTECTION GOALS

Natural Area Restoration

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS



NATURAL RESOURCE PROTECTION GOALS

Natural Functions Protection

Regulating activities throughout the watershed to minimize erosion on construction sites that result could in sedimentation and water pollution.

BACKGROUND



NATURAL RESOURCE PROTECTION GOALS

Natural Functions Protection

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS



EMERGENCY SERVICES GOALS

Overall Summary

Emergency Services measures are taken during an emergency to minimize its impact. These measures are usually the responsibility of city or county emergency management staff and the owners or operators of major or critical facilities.

Example

- ▶ *420 – Open Space Preservation. If/when the city acquires and/or assembles property, consider a policy for a percentage that is to be set aside as perpetual open space. Use deed restrictions to ensure its perpetual.*



EMERGENCY SERVICES

- Hazard threat recognition
- Critical facilities protection
- Hazard warning
- Health and safety maintenance
- Hazard response operations
- Post-disaster mitigation actions



EMERGENCY SERVICES

Hazard Threat Recognition

We MUST have a flood warning and response program that correlates its flood threat recognition system, flood inundation map(s), and its adopted flood warning response plan.

BACKGROUND

With sufficient warning of a flood, a community and its floodplain occupants can take protective measures to mitigate potential damage. A flood threat recognition system integrated with an emergency response plan and a multi-level flood inundation map(s) enables emergency warning dissemination to the public and critical facilities. This is the basis of flood warning and response and is part of the emergency management preparedness cycle.

The National Weather Service (NWS) issues specific flood warnings for many locations along major rivers and coastlines. A community's ability to receive notifications 24 hours a day, seven days a week, and 365 days a year is crucial to utilization of such warnings. Many communities have their own flood threat recognition systems, which enable advance identification of floods on smaller rivers and streams. The full benefit of early flood warning is only realized if the community disseminates the warning to the general public and to critical facilities and has a flood warning and response plan that includes appropriate tasks, such as directing evacuation, sandbagging, and/or moving building contents above flood levels.



EMERGENCY SERVICES

Hazard Threat Recognition

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS



EMERGENCY SERVICES

Critical Facilities Protection

Protect facilities that are critical to the community

There are usually two kinds of critical facilities that a community should address:

- Facilities that are vital to flood response activities or critical to the health and safety of the public before, during, and after a flood, such as a hospital, emergency operations center, electric substation, police station, fire station, nursing home, school, public works, vehicle and equipment storage facility, or shelter.
- Facilities that, if flooded, would make the flood problem and its impacts much worse, such as a hazardous materials facility, power generation facility, water utility, or wastewater treatment plant.

BACKGROUND

PCF credit is provided for regulations that either prohibit critical facilities in the 500-year floodplain or set higher standards for protecting them from flood damage. Full credit is for a prohibition on new critical facilities in the 500-year floodplain. It may not be feasible for some communities to locate critical facilities outside the 500-year floodplain, but they may be able to take some steps towards reducing future risk to these facilities, so partial credit is provided for regulations that allow new facilities in the 500-year floodplain, but set higher protection standards for them. If the standards only apply to some facilities or some parts of facilities, the credit will be prorated. For example, partial credit would be provided if the regulations addressed only one type of critical facility, such as hazardous materials sites or critical facilities owned and managed by the community.



EMERGENCY SERVICES

Critical Facilities Protection

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
Re-do (ck what's in Hazard Mitigation Plan for possible updated info?) - facilities vital to flood response or to the health/safety of public before, during and after a flood, such as hospital, EOC, electric substation, police/fire stations, nursing home, schools, public works, vehicle/equipment storage facilities or shelters; also hazardous material storage facility, power generation facility, water utility or wastewater treatment plant; prohibit in 100 & 500 year zone - partial credit if allowed in 500 yr but protection measures are required - prorated credit if only some types of facilities are covered in our regulations	Protection of critical facilities			
Get w/ Corey and see if we need to update: coordinating warning/response program with critical facilities; facilities must be listed in plan; contact w/facilities to determine any special warning arrangements; must receive credit in CFP1 for any credit, and additional credit for CFP2 if plans have been developed, reviewed or accepted for individual critical facilities (target an outreach for these facilities as to making sure they keep info current)	Critical facilities planning			



EMERGENCY SERVICES

Hazard Warning

Disseminate flood warnings to the public

Emergency Warning Dissemination credit is provided for emergency warning alerts and messages that are disseminated to the public when a flood is imminent. The public is most influenced by the multiple alerts and notifications produced by the emergency manager. Therefore, emergency warning procedures and messages must be planned in order to reduce time of issuance and increase public protective actions. The message content and frequency of issuance greatly influence desired behavior. Multiple channels of alerts and notifications must be employed to reach the maximum number of people and facilities.

Flood warning dissemination provides a critical linkage between the recognition of an impending flood and the community's response to the emergency. New message distribution technology includes the third-generation Emergency Alert System, which includes the Federal Emergency Management Agency's (FEMA's) Integrated Public Alert Warning System (known as IPAWS); the NWS's InteractiveNWS (known as iNWS), Wireless Emergency Alerts (known as WEAs); and various vendor-developed Short Message Service (known as SMS) systems to subscribers.

Once the flood threat recognition system alerts local emergency managers to which areas will be flooded and when, warnings should be issued to the affected populations. The response gap or time delay that takes place between an individual's receiving an alert and taking action can be reduced by pre-scripted messages. The messages that need to be conveyed and the appropriate times to deliver them should be thought out in advance, as part of the flood warning and response plan. Anticipating and targeting potentially impacted people is vital to any alert notification system, pre-planning prevents poor performance.

BACKGROUND



EMERGENCY SERVICES

Hazard Warning

We MUST have a flood warning and response program that correlates its flood threat recognition system, flood inundation map(s), and its adopted flood warning response plan.

BACKGROUND

A community that has created a comprehensive emergency plan will likely receive credit for multiple sub-elements in EWD when it has made the arrangements to execute the plan. For example, a community may have a reverse telephonic notification system (EWD6) that uses pre-scripted messaging templates for a variety of possible flooding events (EWD1) that inform the public of the pending threat and actions to be taken (EWD2). In the planning process the community recognized that some of the population would not receive the landline phone call, so a geocoded cell phone registry of those located in community (EWD8) was established. At public gathering locations or areas with poor cell coverage, the community installed outdoor public address systems (EWD3). The community also worked with the NWS to ensure that flood threats for the community are accurately represented on the NWS/AHPS web site and in EAS announcements (EWD5).

The warning messages should state when flooding is predicted to occur, its expected severity, and appropriate response actions (e.g., evacuation routes, safe shelters, protective actions). As noted earlier, these messages should be predetermined (use of templates or prescribed messages) in order to shorten the time between the agency's awareness of the threat and the issuance of the first alert to the public. Good messages not only consider those in immediate danger, but also those in adjacent areas who might be subject to related impacts from the threat.



EMERGENCY SERVICES

Hazard Warning

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
Verify and obtain copies from State - to see if procedures are outlined in owner's plan; Ensure warning is reached to people in timely manner	Dam failure warning			



EMERGENCY SERVICES

Hazard Response Operations

We MUST have a flood warning and response program that correlates its flood threat recognition system, flood inundation map(s), and its adopted flood warning response plan.

Flood Response Operations credit is based on the extent of coverage and level of detail that the community's flood warning and response plan provides for the flood response operations.

The NIMS requires local governments to validate the inventory of response assets using FEMA's Resources Typing Standards. Department heads and other emergency response team members should know what kinds of resources they have available. This should be compared with the resources needed. Shortfalls may require negotiating agreements with private suppliers or other jurisdictions.

BACKGROUND

Flood warning and response planning must identify every opportunity to prevent loss of life and property damage during a flood. Using information from the flood inundation maps, the planning team should think about how flooding would occur—what areas will be affected and when. Through this brainstorming, the team can decide what actions and resources will become necessary.

Developing scenarios can assist this process by helping the community determine what actions it must plan for, and what resources it is likely to need. Scenarios are produced by thinking through what will happen in the community during a flood (e.g., where will the water go, who will get flooded, who will lose access because of high water, what critical facilities will be affected). By accounting for the local geography, the specific characteristics of the community's residents, and other factors, scenarios help with the design of the response operations so that the threats to life and property at identified flood levels or flood impact areas can be minimized.

The flood warning and response plan must include appropriate actions to be implemented at the different flood levels shown on the flood inundation map or series of maps. For each action that needs to be taken, the plan must assign a person or office. See the examples below.



EMERGENCY SERVICES

Hazard Response Operations

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
Verify and obtain copies from State - to see if plans provide for primary and secondary threat recognition procedures, monitored by operator or local EOC 24/7; primary dam failure threat recognition procedures must include procedures and predetermined conditions for when the operator notifies local emergency managers of potential or actual dam breach and quarterly communication between operator and EOC; secondary recognition backup system must be available to emergency manager ongoing, but need to coordinate w/State to ensure equipment is tested at least quarterly	Dam failure threat recognition system			
	Dam failure threat recognition system			



EMERGENCY SERVICES

Health and Safety Maintenance

We MUST have a flood warning and response program that correlates its flood threat recognition system, flood inundation map(s), and its adopted flood warning response plan.

BACKGROUND



EMERGENCY SERVICES

Health and Safety Maintenance

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS



EMERGENCY SERVICES

Post-Disaster Mitigation Actions

We MUST have a flood warning and response program that correlates its flood threat recognition system, flood inundation map(s), and its adopted flood warning response plan.

BACKGROUND



EMERGENCY SERVICES

Post-Disaster Mitigation Actions

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS



STRUCTURAL PROJECT GOALS

Overall Summary

Structural projects keep flood waters away from an area with a levee, reservoir, or other flood control measure. They are usually designed by engineers and managed or maintained by public works staff.

Example

- ▶ *420 – Open Space Preservation. If/when the city acquires and/or assembles property, consider a policy for a percentage that is to be set aside as perpetual open space. Use deed restrictions to ensure its perpetual.*



STRUCTURAL PROJECT GOALS

- Reservoirs
- Channel modifications
- Levees/floodwalls
- Storm drain improvements
- Diversions



STRUCTURAL PROJECT GOALS

Reservoirs

We must have a program to regularly inspect, at least annually, public and private storage basins and remove debris as needed

BACKGROUND

Storage basin maintenance credit is dependent upon annual inspections and regular maintenance of retention, detention, infiltration, and other types of storage basins. The community (or other nonfederal agency) must have a program to regularly inspect, at least annually, public and private storage basins and remove debris as needed. Neither the cost of the work nor the amount of debris removed affects the credit. A program that responds to complaints and conducts inspections after storms is required, but such a program alone is not enough to obtain this credit.

After each inspection, appropriate maintenance must be completed where it has been determined that it is needed.

The maintenance work is normally done by a public works crew, usually without specialized equipment, but backhoes and trucks are frequently required. The objective of this activity is to remove accumulated sediment or debris that prevents the storage or infiltration of excess stormwater. It is important that the community's procedures spell out what can and cannot be removed. In some areas detention facilities also provide water quality treatment. In those situations, special care must be taken when removing sediment and debris to ensure that the facility still provides all its design functions.

Inspection and maintenance may also be performed by the owner of the basin if it is not owned by the community. The community's ordinance (credited under PUB in Activity 450) must require inspections by a registered design professional at least annually, with the reports submitted to the community if the owner is responsible for inspection and maintenance.



STRUCTURAL PROJECT GOALS

Reservoirs

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS



STRUCTURAL PROJECT GOALS

Channel Modifications

We must have a program to regularly inspect, at least annually, public and private storage basins and remove debris as needed

Credit for this element is dependent upon annual inspection and regular maintenance of the natural channels within the community. There is no credit in this element for the inspection or maintenance of catch basins, canals, ditches, pipes, roadways, road drainage, or similar infrastructure. The community (or other non-federal agency) must have a program to inspect its natural channels annually, upon receiving a complaint, and after each major storm, and the community must record such inspections. The community (or other nonfederal agency) must remove debris as needed after each inspection in accordance with a written maintenance plan. Neither the cost of the work nor the amount of debris removed affects the credit. While responding to complaints and performing inspections after storm events are required to obtain credit, a program that only responds to complaints or inspects after storms is not eligible for this credit.

BACKGROUND

To receive full credit for this activity, the community must document that it annually inspects, and maintains as required, all public and private channels in the developed portion of the community, not just natural channels in the floodplain. The impact adjustment determines the final credit, based on the percentage of the conveyance system that is covered by the inspection and maintenance program and proper documentation of the annual inspections. Note that CDR credit is provided for the natural channels that are inspected every year, and not for programs that inspect a portion of the system in one year and another portion in another year.

The maintenance work is normally done by a public works crew, frequently without heavy equipment. The objective of this activity is to remove accumulated debris, yard waste, trash, shopping carts, and the like that obstruct flows that can cause flooding to adjacent properties. It is important that the community's procedures spell out what can and cannot be removed. In areas with natural streams, for example, a certain amount of woody debris may remain in the channel area without causing a flooding problem. Concrete-lined ditches, by contrast, may need to have all debris removed in order to maintain their carrying capacity.



STRUCTURAL PROJECT GOALS

Channel Modifications

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
Check w/ Shows, Deaman and Waits for any that may qualify here - structural control projects (TUC & TUF) must be certified by a professional engineer as to design and construction and the implementing an operations and maintenance plan; LOMR must be submitted if lowers the BFE on the FIRM; ensure impact of future development does not adversely affect the flood protection level by enforcing watershed-wide regulations that prevent increase in stormwater runoff with impact adjustment of 1.0 for the watershed upstream of project and design storm must be at least as large as the flood protection level for project; designing the project so that it performs to its design protection level based on the watershed that is fully built out/developed in accord w/ long-range plan; environmental compliance	Structural flood control technique used: Channel Modifications			



STRUCTURAL PROJECT GOALS

Storm Drain Improvements

Keep the channel and storage basin (detention or retention) portion of a community's drainage system clear of debris in order to maintain its flood-carrying and storage capacity during floods, and to protect water quality

- (1) Drainage system inspections—Credit for this activity is dependent upon annual inspection of the natural conveyance system and/or storage basins, and proper documentation of those inspections. The community (or other non-federal agency) must have a program to inspect its drainage facilities annually, upon receiving a complaint, and after each major storm. If all parts of the natural system cannot be inspected annually (for example, because there is no legal access to those parts of the streams that lie on private property or for budgetary reasons), then credit will be adjusted by the impact adjustment. Written records of inspections correlated to specific parts of the inventory are required for CRS credit.
- (2) Inspection and maintenance—The inspection and maintenance of the streams and storage basins can be provided by the community, another non-federal agency, or private property owners. Many communities are in flood control or drainage districts that perform this work. Whether the inspections and maintenance are performed by the community; a county, regional or state agency; or a private property owner, the Community Rating System (CRS) community is responsible for providing all the documentation needed to verify credit. An inventory and map of the system as well as written procedures and inspection records are required for CRS credit.

BACKGROUND



STRUCTURAL PROJECT GOALS

Storm Drain Improvements

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
If we determine whether any property protection or drainage improvements are feasible (see list of approved measures on page 360-2 and 510-20; document findings; summary of process that was followed; whether property owner was involved; general map w/statement of problems; table w/basic info for each bldg.; who, when, how of actions to be implemented;	Repetitive loss area analysis			



PUBLIC INFORMATION GOALS

Overall Summary

Public Information activities advise property owners, potential property owners, and visitors about the hazards, ways to protect people and property from the hazards, and the natural and beneficial functions of local floodplains. They are usually implemented by a public information office.

Example

- ▶ *420 – Open Space Preservation. If/when the city acquires and/or assembles property, consider a policy for a percentage that is to be set aside as perpetual open space. Use deed restrictions to ensure its perpetual.*



PUBLIC INFORMATION GOALS

- Map information
- Library
- Outreach projects
- Technical assistance
- Real estate disclosure
- Environmental education



PUBLIC INFORMATION GOALS

Map Information

We must have a program to regularly inspect, at least annually, public and private storage basins and remove debris as needed

BACKGROUND

Maps are an effective method of communicating information about flood hazards. Residents and businesses that are aware of potential flood hazards can take steps to avoid problems and/or reduce their exposure to flooding. Communities are the best source of map information because they can often supplement and clarify the Flood Insurance Rate Map (FIRM) with complementary maps, and with information on additional hazards, flooding outside mapped areas, development regulations that affect floodplain properties, flood insurance, natural floodplain functions, and property protection measures.

A map information service can greatly help a community's residents as well as its banks, insurance agents, real estate agents, and anyone else who needs flood hazard information. This public service is particularly helpful to those who have trouble reading maps, people from out of town, and those who do not have access to the latest maps or all the hazard information available in the community.

This activity is also intended to bring other available community resources to bear on each individual situation. Such resources include local topographic, planning, road, and utility maps; geographic information systems (GISs); maps of special flood-related hazard areas; permit records; and subdivision plats. Where they are available, these other resources can complement the FIRM as sources of additional flood data or more detailed map information.



PUBLIC INFORMATION GOALS

Map Information

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
advertise availability	Additional Map Data: SFHA, corporate limits, streets & lot boundaries			
advertise availability	Additional Map Data: buildings, building outlines or footprints			
advertise availability	Additional Map Data: floodways			
advertise availability	Additional Map Data: base flood elevations			
advertise availability	Additional Map Data: FIRM zone attributes			
advertise availability	Additional Map Data: 500-year floodplain elevations or boundaries			



PUBLIC INFORMATION GOALS

Map Information

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
advertise availability	Additional Map Data: other natural hazards			
advertise availability	Additional Map Data: topographic contour lines			
advertise availability	Additional Map Data: floodplain data in the tax assessment data base			
advertise availability	Additional Map Data: old FIRM's			
advertise availability	Additional Map Data: other regulations			
advertise availability	Additional Map Data: Natural floodplain functions			
advertise availability	Additional Map Data: building elevation data			
advertise availability	FIRM maintenance			



PUBLIC INFORMATION GOALS

Library

We must have a program to regularly inspect, at least annually, public and private storage basins and remove debris as needed

BACKGROUND



PUBLIC INFORMATION GOALS

Library

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
advising of the publications on hand at the library (9 required publications (see list in table 350-1 on page 350-3) housed/cataloged in Library - get updated letters from H'burg, USM both Cook/McCain library's; check w/Wm Carey and Lamar County and see if they have info or will add as well)	Flood protection library			
advise public of other items such as Flood Insurance Study, Hazard Mitigation Plan, Floodplain Management Plan and/or Ordinance, FIRM (1 point for each document) on hand at the library	Locally pertinent documents			



PUBLIC INFORMATION GOALS

Outreach projects

We must have a program to regularly inspect, at least annually, public and private storage basins and remove debris as needed

BACKGROUND



PUBLIC INFORMATION GOALS

Outreach projects

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
ongoing, but need to update "Known Flood Hazard Map" based on FMP input in step 4 - see "Preventive" possibly regulation	Other flood problems not shown on the FIRM/ Other Higher Standard/Higher Study Standard			
advertise availability	Natural floodplain functions			
update our current brochure and find other sources for distribution of info (see stakeholder delivery); maybe create brochure, etc. in English and Spanish	Outreach Projects			
create "Event Oriented" outreach - prepared in advance of event covering key messages that need to be disseminated before, during and after flood event)/adjusted annually to ensure info stays current (see table 330-1 on pg. 330-11) -other hazard types as well could be created - such as Tornado	Flood response preparation			
Contact any agency, organization or person (other than the community itself) that supports/initiates the message and is listed in the PPI plan. Schools that implement outreach activities; newspaper that publishes a flood or hurricane season supplement each year; neighborhood or civic association that sponsors/hosts a presentation by a community employee, utility company that includes pertinent articles in its monthly bills. insurance company that	Stakeholder delivery			



PUBLIC INFORMATION GOALS

Technical Assistance

We must have a program to regularly inspect, at least annually, public and private storage basins and remove debris as needed

BACKGROUND



PUBLIC INFORMATION GOALS

Technical Assistance

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
publicized annually; 1 on 1 w/citizen; qualified staff identified; records kept; PPI must include discussion of the service and recommendations on how should be conducted; FIA, CP and CPI are not required for this credit, but if plan is done, it must discuss providing technical assistance as a way to encourage people to purchase, maintain or improve their coverage	Technical Assistance.			



PUBLIC INFORMATION GOALS

Real Estate Disclosure

We must have a program to regularly inspect, at least annually, public and private storage basins and remove debris as needed

BACKGROUND



PUBLIC INFORMATION GOALS

Real Estate Disclosure

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
Ensure Real Estate Agents are inform potential purchasers of SFHA via property summary sheets, offer-to-purchase forms, Multiple Listing Service forms or others/whatever method it must state that property is in SFHA or not; it must tell inquirer that federal law requires flood insurance for federally backed mortgages -must specifically state that Flood Insurance is required; must be volunteered by the real estate office, not only when asked; seller's statement does not qualify, must state in SFHA not just whether or not seller experienced flood, must review real estate agents annually to evaluate and improve program	Disclosure of the flood hazard			
Talk w/local Agents and see if they would agree to handing out brochure that advises reader to check to see if property is in a flood zone (example: Brochure - Check before you buy: Know Your Flood Risk! see page 340-9 for sample language; also consider adding a small GIS flood map in brochure? - would show areas of SFHA, maybe even one w/drainage, street flooding, flash flooding, etc. layers on map) - We may have to provide to ensure they have/use? Determine how we could ensure compliance.	Real Estate agents' brochure			



PUBLIC INFORMATION GOALS

Environmental Education

We must have a program to regularly inspect, at least annually, public and private storage basins and remove debris as needed

BACKGROUND



PUBLIC INFORMATION GOALS

Environmental Education

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
Heavy promotion provided for how the warning of potential dam failure will be disseminated to the public	Dam failure warning			
PPI specify message and recommend best way to disseminate info advising citizens of Stream Dumping Ordinance (possibly amend annual mailout)	Stream dumping regulations			



FLOODPLAIN MANAGEMENT PLANNING COMMITTEE

Meeting 5 - September, 13 2018

Train Depot Conference Room

4:00 – 5:30

1. Call to Order
2. Prayer
3. Minutes
4. Review Possible Goals and Activities
5. Next Meeting September 27, 2018
6. Questions/Answers
7. Adjourn



STATE OUR
GOALS
Of the HMP
and FMP

A GOAL
WITHOUT
A PLAN
IS JUST
A WISH



REVIEWING POSSIBLE ACTIVITIES

Review Preventive Activities

such as zoning and land use ordinances, floodplain management regulations, storm water management regulations, building codes, subdivision ordinance, preservation of open space, comprehensive plans and the effectiveness of current regulatory and preventive standards and programs that could prevent or reduce the severity of the problems identified in the Problem Assessment.

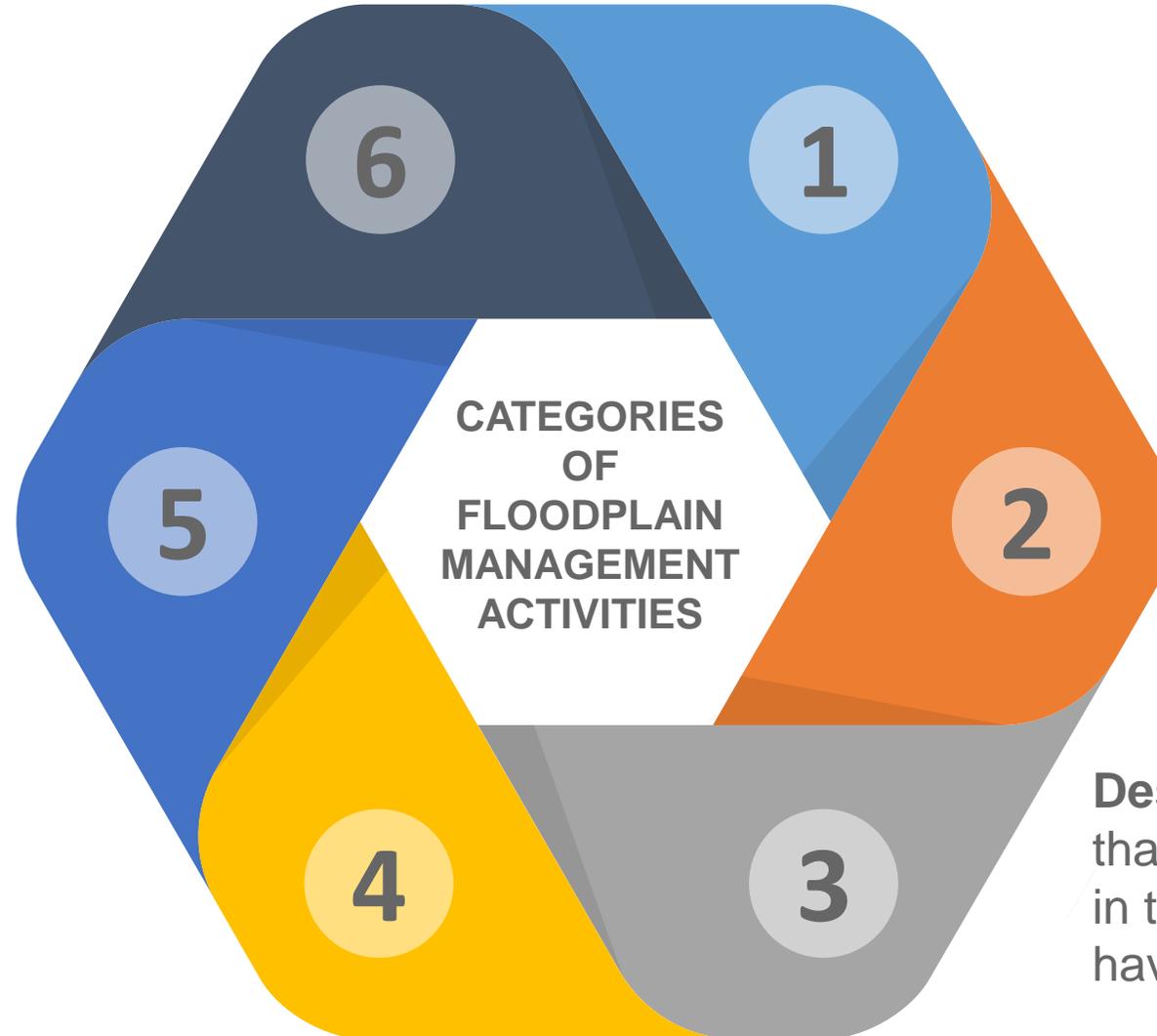
Review should include:

- ▶ How these tools can reduce future flood losses;
- ▶ The current standards in the community's plans and regulations;
- ▶ Whether the community should adopt or revise such plans and regulations;



REVIEWING POSSIBLE ACTIVITIES

1. Preventive
2. Property Protection
3. Natural Resource Protection
4. Emergency Services
5. Structural Projects
6. Public Information



Describe the Impact
that the hazards identified
in the hazard assessment
have



REVIEWING POSSIBLE ACTIVITIES

Fully describe all activities considered

and the discussion of why the activity is or is not appropriate for the community and its flood problems

Is it appropriate and/or feasible?

- ▶ The Community's capability to fund and implement the activity;
- ▶ For all currently implemented activities, the plan must note if the activity is achieving expectations and, if not, whether it should be modified; and
- ▶ If the plan is an update of a previously credited plan, each activity recommended by the previous plan must be discussed; along with the status of implementation.



PREVENTATIVE GOALS

Overall Summary

Preventative activities keep flood problems from getting worse. The use and development of flood-prone areas is limited through planning, land acquisition, or regulation. They are usually administered by building, zoning, planning, and/or code enforcement offices.

Example

- ▶ *420 – Open Space Preservation. If/when the city acquires and/or assembles property, consider a policy for a percentage that is to be set aside as perpetual open space. Use deed restrictions to ensure its perpetual.*



PREVENTATIVE GOALS

- Floodplain mapping and data
- Planning and zoning
- Open space preservation
- Stormwater management
- Floodplain regulations
- Drainage system maintenance
- Erosion setbacks
- Building codes

**ACCORDING TO THE CRS
COORDINATOR'S MANUAL,
FEMA PROVIDES ACTIVITY
RECOMMENDATIONS THAT
CORRESPOND TO EACH
CATEGORY.**



PREVENTATIVE GOALS

Floodplain mapping and data

Outdated mapping hinders sound floodplain management

BACKGROUND

Development regulations need thorough and accurate mapping of Special Flood Hazard Areas (SFHAs) and related flood hazard data. Most communities in the National Flood Insurance Program (NFIP) have a Flood Insurance Rate Map (FIRM) provided by the Federal Emergency Management Agency (FEMA). Most FIRMs have detailed data but some communities still have flood problem areas for which detailed data were not provided by FEMA. As a result, new development in those areas is often not well-protected from flood damage.



PREVENTATIVE GOALS

Floodplain mapping and data

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
See if maybe EMD/NOAA has more info or just use Inundation Maps	Provide Flood Depth Data			
Show past flooding, high-water marks or repetitive loss areas (include dates, injuries, warning times)	Provide Historical Flood Information			
add layer for designated wetlands (USGS? Map) or critical habitat areas	Provide Natural floodplain functions			
Use EC forms data to add this layer	Show base flood elevations and Additional Map Data: building elevation data			
we have pictures of oldest ones taken at McCain Library where archived and stored; and latest 2 or 3 are stored in Planning and Engineering (Jerald has) Offices - could possibly add as layers, ask Hema what kind of time this would take, may not be worth 6 points	Additional Map Data: old FIRM's			
update and map repetitive loss areas	Additional Map Data: other regulations			
update and map wetlands and area near Currie St/E Hardy St if we designate as Natural area restoration	Additional Map Data: Natural floodplain functions			
Get old info on file and w/ Eng. to determine if we have any that qualify	Benchmark maintenance			



PREVENTATIVE GOALS

Planning and Zoning

Must have a zoning ordinance that identifies different development criteria and densities for different areas

There is additional credit for low density zoning in areas subject to special flood-related hazards.

Credit is provided for zoning areas of the regulatory floodplain to keep them substantially open. Zoning an area for agriculture, conservation, or large residential lots preserves more open space than allowing more intensive development.

LZ credit is available for undeveloped land within low-density zoning districts, as well as for areas developed in accordance with the density requirements within the regulatory floodplain. “Low-density” means that that size of the lots is at least 5 acres. For this element, it does not matter why an area is zoned for low density; what counts is the minimum lot size and lot coverage allowed in the zoning district.

The credit for low-density zoning is based upon the traditional zoning approach of setting minimum lot sizes for different zoning districts. The bigger the lot size, the less dense the floodplain development and the more credit provided. The credit also factors in lot coverage for non-residential zones.

BACKGROUND



PREVENTATIVE GOALS

Planning and Zoning

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
ongoing - verify ord lot sizes - provides credit for zoning areas of the SFHA to keep them substantially open (examples: A-1 and A-2 zoning) based on ratio of lot size in ordinance x 60 + impact adjustment	Low-density zoning			
Amend LDC to require an evacuation plan for new residential subdivisions that exceed a certain number of units/street (designate number of minimum units)	Other Higher Standard			
city must require that erosion/sediment control measures be taken on land disturbed during development, based on size of area and applied to all construction sites - including construction of bldgs., road's etc.	Erosion and sedimentation control regulations			
city must implement best management practices to protect water quality and regulations must specify one or more measures or refer to BMP's as published in an official government reference	Water quality regulations			



PREVENTATIVE GOALS

Open Space Preservation

Prevent flood damage by keeping flood-prone lands free of development, and Protect and enhance the natural functions of floodplains.

BACKGROUND

Floods are natural processes and floodplains are necessary to every river and coastal system. A floodplain has been defined as any land susceptible to being inundated by flood waters. Floodplains can also be regarded as the land needed by a river or stream to convey and store flood waters or the coastal areas subject to inundation during a storm.

Preserving the floodplain as open space allows it to serve these primary natural functions and many other important functions. Keeping the floodplain free of development—free of buildings and infrastructure—means that there will be no flood insurance claims, no closed businesses, no homeless residents, no damaged infrastructure, and that the community can return to normal quickly after flooding occurs.



PREVENTATIVE GOALS

Open Space Preservation

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
Verify/Maintain our 2009 submitted info				



PREVENTATIVE GOALS

Stormwater Management

Prevent future development from increasing flood hazards to existing development, to protecting existing hydrologic functions within the watershed, and to maintain and improve water quality.

Because development typically results in an increase in the amount of runoff, stormwater management usually requires that a volume of flood water be stored onsite during the storm to prevent increased frequency and severity of flooding. It is released after the runoff subsides (stormwater DETENTION). A developer may store this excess runoff for a short time so that it may be used for irrigation or groundwater recharge or to reduce pollution (stormwater RETENTION). When retention is used for stormwater management, the retained runoff is not discharged to the stream system.

BACKGROUND

Detention does not reduce the amount of water flowing downstream; rather, it simply lets it out over a longer period of time to reduce the peak flow immediately downstream of the site. This can still cause flooding problems farther downstream and the additional volume of water can destabilize channel banks and cause other problems. Therefore, stormwater retention or extended detention is preferable to simple detention for peak flows. If stormwater retention is used, the community must ensure that adequate storage is again available within a reasonable time in case another storm occurs.



PREVENTATIVE GOALS

Stormwater Management

Prevent future development from increasing flood hazards to existing development, to protecting existing hydrologic functions within the watershed, and to maintain and improve water quality.

Other approaches, such as low-impact development regulations, can be used to reduce the total runoff that leaves a site as well as peak flows. These techniques help preserve a site's ability to absorb its runoff. Credit may be provided for other approaches to managing the impact of development on runoff, if the community can show that there is no increase in flood risk or erosion downstream.

BACKGROUND

Maintenance of these required facilities is vital—if they silt in or become clogged, they provide no flood protection benefits. Therefore, there are separate credits under Activity 540 for maintaining storage facilities. SMR credit is the sum of the credit for four sub-elements:

- Size of development (Section 452.a(1), SZ),
- Design storm used (Section 452.a(2), DS),
- Low-impact development regulations (Section 452.a(3), LID), and
- Public agency authority to inspect and maintain, at the owner's expense, private facilities constructed to comply with the ordinance (Section 452.a(4), PUB).

Communities are encouraged to check with their regional stormwater management agency to see if they can apply for credit based on the stormwater management program implemented by the regional agency.



PREVENTATIVE GOALS

Stormwater Management

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
Consider amending our ord for new development to prevent/reduce the increase in runoff that results from urbanization from 10-year storm or larger.	Prevent/reduce the increase in runoff for new development		Additional credit is available if the community addresses larger storms, and controls the total volume of runoff from new development, and broken down into 4 categories below (must have SZ and DS credit to receive any credit for SMR):	Must have watershed map w/total areas and calculate the area of watershed and area subject to regulations (portion in City limits for example) is part of the impact adjustment for this activity
Consider amending our Ord. to add regulations that clearly state ALL development is subject to regulations (prorated if only some types or sizes of development are regulated)	Size of Development regulated			
Consider amending - Max credit if regulations clearly state that all discharges up to and including that from the 100-yr storm must be released at rates not exceeding the pre-development peak discharge - credit is for what size storm detention is designed for and additional credit if the volume is also controlled	Design Storms used in regulations		bonus credit for controlling the volume of runoff if regulations require retention of all runoff or if the total volume of water released, measured above half of the 2-year flow rate is no more than the pre-development volume	



PREVENTATIVE GOALS

Stormwater Management

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
Consider amending our ord to encourage "Green infrastructure" practices or Stormwater Management Plan that requires use of "soft" techniques	Low-impact development			
Establish and enforce maintenance procedures and City having authority to inspect, perform maintenance should owners not comply	Public maintenance of required facilities			
Manage the runoff from "all storms" up to and including the 100-yr event to ensure that flood flows downstream of new development do not increase due to the development	Watershed Master Plan: Manage all storms up to and including the 100 year			
Provide onsite management of future peak flows and volumes so that they do not increase over present values	Watershed Master Plan: Management of future peak flows and volumes			
Manage the runoff from "all storms" up to and including the 5-day event	Watershed Master Plan: Manage all storms up to and including the 5-day event			
Community has a funding source dedicated to implementing the plan's recommendations	Watershed Master Plan: Dedicated funding source to implement the plan			



PREVENTATIVE GOALS

Stormwater Management

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
Consider amending Stormwater Ordinance to add a Watershed Master Plan as broken down in WMP1-8 and all the requirements here: must have stormwater regulations through an adopted watershed master plan that evaluates the impact of future conditions for at least one watershed that drains into the community for multiple storm events, including the 100-yr storm; must identify the natural drainage system and constructed channels; must have adopted regulatory standards that require onsite management of runoff from all storms up to and including the 25-yr event that receive credit under SMR and manage future peak flows; "all storms" includes at a min. the 10-yr storm in addition to 25 yr. event; management of a 2-yr storm is recommended; plan must be current (within 5 yrs.) or City must evaluate the plan to ensure still applicable to current conditions	Watershed Master Plan: Plan meets all the criteria listed in Sec 452.b			



PREVENTATIVE GOALS

Floodplain Regulations

Protect existing and future development and natural floodplain functions that exceed the minimum criteria of the National Flood Insurance Program (NFIP).

Although the NFIP minimum standards provide a great deal of flood protection, damage can still result for many reasons:

- Estimates of flood heights are subject to various errors;
- Changes in weather patterns may alter floodheights;
- Buildings may be damaged by floods that exceed the predicted 100-year flood;
- Urbanization and other changes in the watershed can increase the flood hazard and flood frequency;
- Filling and other development in the floodplain can reduce storage and conveyance capacity, increasing flood hazards; and
- Filling and construction practices can damage or destroy valuable natural floodplain functions. For these reasons, and the fact that local situations vary, many communities adopt development standards that are higher than or supplement the minimum NFIP criteria. This activity provides credit for those regulatory standards.

BACKGROUND



PREVENTATIVE GOALS

Floodplain Regulations

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
ongoing, but need to update "Known Flood Hazard Map" based on FMP input in step 4 and possibly regulate as if in a special flood hazard area, requiring freeboard elevation - if so, send to FEMA for map amendment, adding these areas to the SFHA?	Other flood problems not shown on the FIRM/ Other Higher Standard/Higher Study Standard			
Amend LDC and/or Flood Prevention Ordinance requiring all structures in a new Flood Inundation Area (established on State/Fed Permits) to be elevated to established Freeboard; map area and possibly submit to FEMA for map amendment OR just allow for "cluster" development whereby the inundation area stays green and allows the structures to be placed in/around but not in danger area	New Study/Higher study standards/Other Higher Standard/Open Space Incentive			
Amend LDC and/or Flood Prevention Ordinance to require new subdivisions with a dam to meet all the State and Federal requirements/obtain permits prior to local permitting.	Higher study standards or Other Higher Standard			



PREVENTATIVE GOALS

Floodplain Regulations

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
Amend Flood Prevention Ordinance to prohibit floodproofing as a flood protection measure for ALL new buildings (we currently allow for commercial structures) (means all residential and commercial structures in a SFHA would have to be elevated to established freeboard)	Other Higher Standard			
Long Shot - would need ordinance language that prohibits fill; however, gives approx. 1/2 credit if developer provides compensatory storage which might be a good compromise?	Prohibition of fill			
Don't recommend at this time - Twin Forks development would be out if we adopted ordinance language that prohibits building	Prohibition of buildings			



PREVENTATIVE GOALS

Drainage System Maintenance

Keeping our streams, channels, and storage basins clear of debris so that flood carrying and storage capacity are maintained

BACKGROUND

A community's drainage system consists of natural watercourses or channels; constructed storm drains, canals, and ditches; and detention/retention basins built to store high flows. In most cases, the actual channel of a natural stream will carry only the two-year flood, with larger flows being carried in the overbank area. Constructed channels are typically designed to carry larger floods than natural channels do, and communities usually have an active maintenance program for their constructed facilities. When a channel loses a portion of its conveyance capacity, overbank flooding occurs more frequently and flows reach higher elevations, potentially damaging nearby structures or causing increased channel erosion.

Even where floodplain regulations prevent construction from encroaching, streams can lose their carrying capacities as a result of the accumulation of debris, sedimentation, and the growth of unwanted vegetation. Detention and retention basins can lose their ability to store water if upstream sediment controls do not function properly or if there are highly erosive lands upstream.

One proven approach to preventing this reduction of capacity is a community program that routinely inspects and clears debris from the channels and basins. This work can be as simple as cleaning out culverts and removing trash, shopping carts, and similar debris that can dam a stream and cause flooding, even during small storms.



PREVENTATIVE GOALS

Drainage System Maintenance

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
ongoing, but need to improve maintenance schedule	Channel Debris Removal			
Inventory and map all channels in SFHA (or City-wide?), all USGS quadrangle and draining more than 40 contributing acres; large underground segments of the surface conveyance system need to be shown if they convey flow from a natural channel; on the map and inventory segments, portions or components of natural conveyance system must be identified; identify owner (city, state, private); and who inspects and maintains each segment	Channel Debris Removal			
ongoing, but need to improve maintenance schedule	Stream dumping regulations			
Check ordinance for possible updating/amending to ensure regulation not only prohibits but allows for enforcement throughout drainage system	Stream dumping regulations			
Update Resolution to ensure it designates a person responsible for complaints/monitoring/compliance and enforcement and abatement provisions	Stream dumping regulations			
Inventory and Map problem site maintenance locations (ex. "choke" points, chronic dumping, obstruction of flows or erosion/sedimentation problems , etc.) in all channels in SFHA (or City wide?)- set up more frequent inspections for better maintenance of these areas and identify in resolution	Problem site maintenance			



PROPERTY PROTECTION GOALS

Overall Summary

Property Protection activities are usually undertaken by property owners on a building-by-building or parcel basis.

Example

- ▶ *420 – Open Space Preservation. If/when the city acquires and/or assembles property, consider a policy for a percentage that is to be set aside as perpetual open space. Use deed restrictions to ensure its perpetual.*



PROPERTY PROTECTION GOALS

- Relocation
- Retrofitting
- Acquisition
- Sewer backup protection
- Building elevation
- Insurance



PROPERTY PROTECTION GOALS

Acquisition and Relocation

The Federal Emergency Management Agency (FEMA) administers three grant programs to assist communities in mitigating the effects of natural hazards: the Flood Mitigation Assistance (FMA) Program, the Hazard Mitigation Grant Program (HMGP), and the Pre-Disaster Mitigation (PDM) grant program.

BACKGROUND

Acquisition and relocation projects remove people and property from harm's way and reduce the community's costs for disaster response, recovery, and repair. The Federal Emergency Management Agency (FEMA) recognizes that the acquisition of buildings in the floodplain is especially effective at reducing flood losses because it is a permanent form of mitigation. Other government agencies also have found acquisition projects to be more cost effective than major flood control projects.

Acquisition and relocation (or demolition) of buildings also creates additional open space in the floodplain and allows those lands to return to their natural functions. Acquisition is the most effective mitigation alternative for addressing repetitive loss properties.



PROPERTY PROTECTION GOALS

Acquisition and Relocation

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
detailed mitigation plan for RL area, specific guidance on how to reduce damage; see if any have been mitigated/removed; must address every address in the RL area; area mapped; contact other agencies for input, visit each building and collect basic data - drainage patterns, condition of structure, types of foundation; historic flood info; date of bldgs. ins claim and source of flooding; RLAA info must be adopted by Council separately	Repetitive loss area analysis			



PROPERTY PROTECTION GOALS

Retrofitting

Protect buildings from flood damage by

- *Retrofitting the buildings so that they suffer no or minimal damage when flooded, and/or*
- *Constructing small flood control projects that reduce the risk of flood waters' reaching the buildings.*

Existing buildings can be protected on site, especially from shallow, slow-moving flood waters, by implementing one or more flood protection techniques.

This activity provides credit for buildings located in the floodplain that have been protected from flood damage by being retrofitted or by the placement of certain types of flood control structures that protect building(s) to at least the 25-year flood level.

BACKGROUND

Retrofitting projects, such as

- o Elevating buildings above predicted flood levels,

- o Dry floodproofing,

- o Wet floodproofing,

- o Protecting basements from sewer backup, and

- o Barriers (for individual structures only), including levees, berms, and floodwalls.



PROPERTY PROTECTION GOALS

Retrofitting

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS



PROPERTY PROTECTION GOALS

Sewer Backup Protection

Don't let clogged sewers wreak havoc on your home

BACKGROUND

Most homeowners may not realize that they are responsible for the maintenance and repair of their house or sewer lateral—that is, the pipeline between the city sanitary sewer main (which is usually located in the street) and the building.

The sewer lateral is owned and maintained by the property owner and the homeowners responsibility includes any part of the lateral that extends into the street or public right of way. A cracked or deteriorated lateral or one filled with tree roots can allow groundwater to seep into the system, contributing to the problem.

For homeowners who want to insure themselves against sewer backups, coverage is available from most providers for a nominal cost.



PROPERTY PROTECTION GOALS

Sewer Backup Protection

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS



PROPERTY PROTECTION GOALS

Building Elevation

Freeboards are several pillars under a home that elevate it higher than the legally mandated height requirement

BACKGROUND

The NFIP requires that the lowest floor of residential structures be elevated to or above the base flood elevation and that non-residential structures be elevated or floodproofed to or above the base flood elevation. Attached garages and utilities (including electrical, heating, ductwork, ventilating, plumbing, and air conditioning equipment) must also be protected to the base flood elevation (44 Code of Federal Regulations (CFR) §60.3(a)(3)). This can be done by elevating them or using flood-resistant materials during construction.

A freeboard requirement adds height above the base flood elevation to provide an extra margin of protection to account for waves, debris, miscalculations, changing weather patterns, or lack of data.



PROPERTY PROTECTION GOALS

Building Elevation

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
ongoing, but need better communication between building/planning depts to ensure accuracy of EC's and structure elevation - especially at the "Building Under Construction" Level before slabs are poured	Maintaining Elevation Certificates			



NATURAL RESOURCE PROTECTION GOALS

Overall Summary

Natural Resource Protection activities preserve or restore natural areas or the natural functions of floodplain and watershed areas. They are implemented by a variety of agencies, primarily parks, recreation, or conservation agencies or organizations.

Example

- ▶ *420 – Open Space Preservation. If/when the city acquires and/or assembles property, consider a policy for a percentage that is to be set aside as perpetual open space. Use deed restrictions to ensure its perpetual.*



NATURAL RESOURCE PROTECTION GOALS

- Wetlands protection
- Water quality improvement
- Erosion and sediment control
- Coastal barrier protection
- Natural area preservation
- Environmental corridors
- Natural area restoration
- Natural functions protection



NATURAL RESOURCE PROTECTION GOALS

Wetlands Protection

Protect the natural and beneficial functions of our community's floodprone lands.

There are three reasons why preserving open spaces that support these functions warrant the additional credit available under this element.

- (1) More and more studies are showing that natural open space can be more effective at controlling or attenuating flooding and is less expensive over the long run than traditional manmade flood control structures.
- (2) Local officials and their constituents who are aware of the benefits that naturally functioning floodplains provide to their communities want to protect them. This can generate a continuous level of interest to protect floodplains in order to support local economies or improve recreational opportunities. This interest level persists between infrequent floods, adding to the attention and resources available for flood loss reduction efforts.
- (3) Disrupting natural features has adverse impacts on the flooding regime.

BACKGROUND



NATURAL RESOURCE PROTECTION GOALS

Wetlands Protection

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
additional credit if plan identifies existing wetlands or other natural open space areas to be preserved from development to that natural attenuation, retention, or detention of runoff is provided	Watershed Master Plan: Natural areas to provide retention and detention			



NATURAL RESOURCE PROTECTION GOALS

Erosion and Sediment Control

Regulating activities throughout the watershed to minimize erosion on construction sites that result could in sedimentation and water pollution.

BACKGROUND

Erosion Sedimentation Control credit is provided if the community requires that erosion and sediment control measures be taken on land that is disturbed during development. ESC credit is based upon the size of the areas subject to the regulation. Drainage systems cannot perform to their design standards if they are choked with eroded soil that has been captured in stormwater. Sediment control is especially important in watersheds where land is being disturbed by construction. Sedimentation has been called the largest source of water pollution in the country. Credit Criteria for ESC (1) To receive ESC credit, the community's regulations must apply to all construction sites within the community. An erosion and sedimentation control regulation that is part of a floodplain ordinance or a building code and does not affect

ALL construction sites in the community does not receive credit under this element. "All construction sites" in the subsections below means all sites in the community subject to construction of buildings, roads, etc., regrading, or other non-agricultural land-disturbing activity.



NATURAL RESOURCE PROTECTION GOALS

Erosion and Sediment Control

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS



NATURAL RESOURCE PROTECTION GOALS

Natural Area Preservation

Protect natural channels and shorelines

Natural channels and shorelines are the areas most valuable for protecting natural floodplain functions. They are important places for aquatic and riparian habitat. NSP credit is for allowing these areas to follow their natural processes, such as channel meandering and beach erosion, and to encourage natural shorelines that provide water quality benefits for runoff.

Note that a setback or buffer that prohibits buildings and filling can qualify as OSP but are not sufficient for NSP.

BACKGROUND

Programs to protect channels and shorelines in their natural state are credited in NSP. These include

- Regulations that govern development and construction, such as an ordinance or regulation that governs public and private construction activities; and
- Local policies followed on public lands, such as a written community policy that covers shorelines in city parks.

Protection credit is only available for channels or shorelines that are currently in their approximate natural state, i.e., there is no concrete, rip rap, levees, armoring, beach nourishment, dams, or other human intervention that constrains the natural processes of the shoreline of the river, stream, lake, or ocean.



NATURAL RESOURCE PROTECTION GOALS

Natural Area Preservation

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
additional credit if the plan recommends prohibiting development, alteration or modification of existing natural channels and the community has adopted a qualifying ordinance	Watershed Master Plan: Prohibit alteration of existing natural channels			
additional credit if the plan recommends that channel improvements use natural or "soft" approaches rather than gabions, rip rap, concrete, or other "hard" techniques, and the community has adopted appropriate design standards or ordinances	Watershed Master Plan: Projects must use natural or "Soft" approaches			



NATURAL RESOURCE PROTECTION GOALS

Environmental Corridors

Protect one or more natural functions within the community's floodplain

BACKGROUND

- A habitat conservation plan that explains and recommends actions to protect rare, threatened, or endangered aquatic or riparian species.
- A habitat protection or restoration plan that identifies critical habitat within the floodplain, actions to protect remaining habitat, and/or actions to restore fully functioning habitat. Frequently this will result in the preservation and/or restoration of riparian habitat that is necessary for water-dependent species.
- A “green infrastructure plan” that identifies open space corridors or connected networks of wetlands, woodlands, wildlife habitats, wilderness, and other areas that support native species, maintain natural ecological processes, and/or sustain air and water resources (for credit, the corridors or networks must include some floodplains).
- A plan or section of a comprehensive or other community plan that includes an inventory of the ecological attributes of the watershed and/or the floodplain and recommends appropriate actions for protecting them, provided that the recommendations are implemented through a mechanism such as a development regulation, development order, grant program, or capital improvement plan.



NATURAL RESOURCE PROTECTION GOALS

Environmental Corridors

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
Obtain inventory of all shorelines and what is natural vs hard surfaced (Hema has basic info, but we need to enhance) based on the length of shoreline affected by the natural shoreline protection regulations - setbacks and buffers do not qualify here, but do in OSP; programs that protect channels in their natural state are credited here - no concrete, rip rap, levees, etc. that constrains the natural process of the shoreline of the river, stream or lake	Natural shoreline protection			
Create and adopt a plan that protects one or more natural functions: Examples: "Green" Infrastructure Plan; or section of Comprehensive Plan that includes inventory of ecological attributes of watershed and/or floodplain, recommends actions for protecting them and implemented through a grant, capital improvement plan or development regulation/order - extra credit in 420 if plan exists	Natural floodplain functions plan			



NATURAL RESOURCE PROTECTION GOALS

Natural Area Restoration

Regulating activities throughout the watershed to minimize erosion on construction sites that result could in sedimentation and water pollution.

BACKGROUND



NATURAL RESOURCE PROTECTION GOALS

Natural Area Restoration

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS



NATURAL RESOURCE PROTECTION GOALS

Natural Functions Protection

Regulating activities throughout the watershed to minimize erosion on construction sites that result could in sedimentation and water pollution.

BACKGROUND



NATURAL RESOURCE PROTECTION GOALS

Natural Functions Protection

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS



EMERGENCY SERVICES GOALS

Overall Summary

Emergency Services measures are taken during an emergency to minimize its impact. These measures are usually the responsibility of city or county emergency management staff and the owners or operators of major or critical facilities.

Example

- ▶ *420 – Open Space Preservation. If/when the city acquires and/or assembles property, consider a policy for a percentage that is to be set aside as perpetual open space. Use deed restrictions to ensure its perpetual.*



EMERGENCY SERVICES

- Hazard threat recognition
- Critical facilities protection
- Hazard warning
- Health and safety maintenance
- Hazard response operations
- Post-disaster mitigation actions



EMERGENCY SERVICES

Hazard Threat Recognition

We MUST have a flood warning and response program that correlates its flood threat recognition system, flood inundation map(s), and its adopted flood warning response plan.

BACKGROUND

With sufficient warning of a flood, a community and its floodplain occupants can take protective measures to mitigate potential damage. A flood threat recognition system integrated with an emergency response plan and a multi-level flood inundation map(s) enables emergency warning dissemination to the public and critical facilities. This is the basis of flood warning and response and is part of the emergency management preparedness cycle.

The National Weather Service (NWS) issues specific flood warnings for many locations along major rivers and coastlines. A community's ability to receive notifications 24 hours a day, seven days a week, and 365 days a year is crucial to utilization of such warnings. Many communities have their own flood threat recognition systems, which enable advance identification of floods on smaller rivers and streams. The full benefit of early flood warning is only realized if the community disseminates the warning to the general public and to critical facilities and has a flood warning and response plan that includes appropriate tasks, such as directing evacuation, sandbagging, and/or moving building contents above flood levels.



EMERGENCY SERVICES

Hazard Threat Recognition

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS



EMERGENCY SERVICES

Critical Facilities Protection

Protect facilities that are critical to the community

There are usually two kinds of critical facilities that a community should address:

- Facilities that are vital to flood response activities or critical to the health and safety of the public before, during, and after a flood, such as a hospital, emergency operations center, electric substation, police station, fire station, nursing home, school, public works, vehicle and equipment storage facility, or shelter.
- Facilities that, if flooded, would make the flood problem and its impacts much worse, such as a hazardous materials facility, power generation facility, water utility, or wastewater treatment plant.

BACKGROUND

PCF credit is provided for regulations that either prohibit critical facilities in the 500-year floodplain or set higher standards for protecting them from flood damage. Full credit is for a prohibition on new critical facilities in the 500-year floodplain. It may not be feasible for some communities to locate critical facilities outside the 500-year floodplain, but they may be able to take some steps towards reducing future risk to these facilities, so partial credit is provided for regulations that allow new facilities in the 500-year floodplain, but set higher protection standards for them. If the standards only apply to some facilities or some parts of facilities, the credit will be prorated. For example, partial credit would be provided if the regulations addressed only one type of critical facility, such as hazardous materials sites or critical facilities owned and managed by the community.



EMERGENCY SERVICES

Critical Facilities Protection

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
Re-do (ck what's in Hazard Mitigation Plan for possible updated info?) - facilities vital to flood response or to the health/safety of public before, during and after a flood, such as hospital, EOC, electric substation, police/fire stations, nursing home, schools, public works, vehicle/equipment storage facilities or shelters; also hazardous material storage facility, power generation facility, water utility or wastewater treatment plant; prohibit in 100 & 500 year zone - partial credit if allowed in 500 yr but protection measures are required - prorated credit if only some types of facilities are covered in our regulations	Protection of critical facilities			
Get w/ Corey and see if we need to update: coordinating warning/response program with critical facilities; facilities must be listed in plan; contact w/facilities to determine any special warning arrangements; must receive credit in CFP1 for any credit, and additional credit for CFP2 if plans have been developed, reviewed or accepted for individual critical facilities (target an outreach for these facilities as to making sure they keep info current)	Critical facilities planning			



EMERGENCY SERVICES

Hazard Warning

Disseminate flood warnings to the public

BACKGROUND

Emergency Warning Dissemination credit is provided for emergency warning alerts and messages that are disseminated to the public when a flood is imminent. The public is most influenced by the multiple alerts and notifications produced by the emergency manager. Therefore, emergency warning procedures and messages must be planned in order to reduce time of issuance and increase public protective actions. The message content and frequency of issuance greatly influence desired behavior. Multiple channels of alerts and notifications must be employed to reach the maximum number of people and facilities.

Flood warning dissemination provides a critical linkage between the recognition of an impending flood and the community's response to the emergency. New message distribution technology includes the third-generation Emergency Alert System, which includes the Federal Emergency Management Agency's (FEMA's) Integrated Public Alert Warning System (known as IPAWS); the NWS's InteractiveNWS (known as iNWS), Wireless Emergency Alerts (known as WEAs); and various vendor-developed Short Message Service (known as SMS) systems to subscribers.

Once the flood threat recognition system alerts local emergency managers to which areas will be flooded and when, warnings should be issued to the affected populations. The response gap or time delay that takes place between an individual's receiving an alert and taking action can be reduced by pre-scripted messages. The messages that need to be conveyed and the appropriate times to deliver them should be thought out in advance, as part of the flood warning and response plan. Anticipating and targeting potentially impacted people is vital to any alert notification system, pre-planning prevents poor performance.



EMERGENCY SERVICES

Hazard Warning

We MUST have a flood warning and response program that correlates its flood threat recognition system, flood inundation map(s), and its adopted flood warning response plan.

BACKGROUND

A community that has created a comprehensive emergency plan will likely receive credit for multiple sub-elements in EWD when it has made the arrangements to execute the plan. For example, a community may have a reverse telephonic notification system (EWD6) that uses pre-scripted messaging templates for a variety of possible flooding events (EWD1) that inform the public of the pending threat and actions to be taken (EWD2). In the planning process the community recognized that some of the population would not receive the landline phone call, so a geocoded cell phone registry of those located in community (EWD8) was established. At public gathering locations or areas with poor cell coverage, the community installed outdoor public address systems (EWD3). The community also worked with the NWS to ensure that flood threats for the community are accurately represented on the NWS/AHPS web site and in EAS announcements (EWD5).

The warning messages should state when flooding is predicted to occur, its expected severity, and appropriate response actions (e.g., evacuation routes, safe shelters, protective actions). As noted earlier, these messages should be predetermined (use of templates or prescribed messages) in order to shorten the time between the agency's awareness of the threat and the issuance of the first alert to the public. Good messages not only consider those in immediate danger, but also those in adjacent areas who might be subject to related impacts from the threat.



EMERGENCY SERVICES

Hazard Warning

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
Verify and obtain copies from State - to see if procedures are outlined in owner's plan; Ensure warning is reached to people in timely manner	Dam failure warning			



EMERGENCY SERVICES

Hazard Response Operations

We MUST have a flood warning and response program that correlates its flood threat recognition system, flood inundation map(s), and its adopted flood warning response plan.

Flood Response Operations credit is based on the extent of coverage and level of detail that the community's flood warning and response plan provides for the flood response operations.

The NIMS requires local governments to validate the inventory of response assets using FEMA's Resources Typing Standards. Department heads and other emergency response team members should know what kinds of resources they have available. This should be compared with the resources needed. Shortfalls may require negotiating agreements with private suppliers or other jurisdictions.

BACKGROUND

Flood warning and response planning must identify every opportunity to prevent loss of life and property damage during a flood. Using information from the flood inundation maps, the planning team should think about how flooding would occur—what areas will be affected and when. Through this brainstorming, the team can decide what actions and resources will become necessary.

Developing scenarios can assist this process by helping the community determine what actions it must plan for, and what resources it is likely to need. Scenarios are produced by thinking through what will happen in the community during a flood (e.g., where will the water go, who will get flooded, who will lose access because of high water, what critical facilities will be affected). By accounting for the local geography, the specific characteristics of the community's residents, and other factors, scenarios help with the design of the response operations so that the threats to life and property at identified flood levels or flood impact areas can be minimized.

The flood warning and response plan must include appropriate actions to be implemented at the different flood levels shown on the flood inundation map or series of maps. For each action that needs to be taken, the plan must assign a person or office. See the examples below.



EMERGENCY SERVICES

Hazard Response Operations

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
Verify and obtain copies from State - to see if plans provide for primary and secondary threat recognition procedures, monitored by operator or local EOC 24/7; primary dam failure threat recognition procedures must include procedures and predetermined conditions for when the operator notifies local emergency managers of potential or actual dam breach and quarterly communication between operator and EOC; secondary recognition backup system must be available to emergency manager ongoing, but need to coordinate w/State to ensure equipment is tested at least quarterly	Dam failure threat recognition system			
	Dam failure threat recognition system			



EMERGENCY SERVICES

Health and Safety Maintenance

We MUST have a flood warning and response program that correlates its flood threat recognition system, flood inundation map(s), and its adopted flood warning response plan.

BACKGROUND



EMERGENCY SERVICES

Health and Safety Maintenance

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS



EMERGENCY SERVICES

Post-Disaster Mitigation Actions

We MUST have a flood warning and response program that correlates its flood threat recognition system, flood inundation map(s), and its adopted flood warning response plan.

BACKGROUND



EMERGENCY SERVICES

Post-Disaster Mitigation Actions

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS



STRUCTURAL PROJECT GOALS

Overall Summary

Structural projects keep flood waters away from an area with a levee, reservoir, or other flood control measure. They are usually designed by engineers and managed or maintained by public works staff.

Example

- ▶ *420 – Open Space Preservation. If/when the city acquires and/or assembles property, consider a policy for a percentage that is to be set aside as perpetual open space. Use deed restrictions to ensure its perpetual.*



STRUCTURAL PROJECT GOALS

- Reservoirs
- Channel modifications
- Levees/floodwalls
- Storm drain improvements
- Diversions



STRUCTURAL PROJECT GOALS

Reservoirs

We must have a program to regularly inspect, at least annually, public and private storage basins and remove debris as needed

BACKGROUND

Storage basin maintenance credit is dependent upon annual inspections and regular maintenance of retention, detention, infiltration, and other types of storage basins. The community (or other nonfederal agency) must have a program to regularly inspect, at least annually, public and private storage basins and remove debris as needed. Neither the cost of the work nor the amount of debris removed affects the credit. A program that responds to complaints and conducts inspections after storms is required, but such a program alone is not enough to obtain this credit.

After each inspection, appropriate maintenance must be completed where it has been determined that it is needed.

The maintenance work is normally done by a public works crew, usually without specialized equipment, but backhoes and trucks are frequently required. The objective of this activity is to remove accumulated sediment or debris that prevents the storage or infiltration of excess stormwater. It is important that the community's procedures spell out what can and cannot be removed. In some areas detention facilities also provide water quality treatment. In those situations, special care must be taken when removing sediment and debris to ensure that the facility still provides all its design functions.

Inspection and maintenance may also be performed by the owner of the basin if it is not owned by the community. The community's ordinance (credited under PUB in Activity 450) must require inspections by a registered design professional at least annually, with the reports submitted to the community if the owner is responsible for inspection and maintenance.



STRUCTURAL PROJECT GOALS

Reservoirs

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS



STRUCTURAL PROJECT GOALS

Channel Modifications

We must have a program to regularly inspect, at least annually, public and private storage basins and remove debris as needed

Credit for this element is dependent upon annual inspection and regular maintenance of the natural channels within the community. There is no credit in this element for the inspection or maintenance of catch basins, canals, ditches, pipes, roadways, road drainage, or similar infrastructure. The community (or other non-federal agency) must have a program to inspect its natural channels annually, upon receiving a complaint, and after each major storm, and the community must record such inspections. The community (or other nonfederal agency) must remove debris as needed after each inspection in accordance with a written maintenance plan. Neither the cost of the work nor the amount of debris removed affects the credit. While responding to complaints and performing inspections after storm events are required to obtain credit, a program that only responds to complaints or inspects after storms is not eligible for this credit.

BACKGROUND

To receive full credit for this activity, the community must document that it annually inspects, and maintains as required, all public and private channels in the developed portion of the community, not just natural channels in the floodplain. The impact adjustment determines the final credit, based on the percentage of the conveyance system that is covered by the inspection and maintenance program and proper documentation of the annual inspections. Note that CDR credit is provided for the natural channels that are inspected every year, and not for programs that inspect a portion of the system in one year and another portion in another year.

The maintenance work is normally done by a public works crew, frequently without heavy equipment. The objective of this activity is to remove accumulated debris, yard waste, trash, shopping carts, and the like that obstruct flows that can cause flooding to adjacent properties. It is important that the community's procedures spell out what can and cannot be removed. In areas with natural streams, for example, a certain amount of woody debris may remain in the channel area without causing a flooding problem. Concrete-lined ditches, by contrast, may need to have all debris removed in order to maintain their carrying capacity.



STRUCTURAL PROJECT GOALS

Channel Modifications

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
Check w/ Shows, Deaman and Waits for any that may qualify here - structural control projects (TUC & TUF) must be certified by a professional engineer as to design and construction and the implementing an operations and maintenance plan; LOMR must be submitted if lowers the BFE on the FIRM; ensure impact of future development does not adversely affect the flood protection level by enforcing watershed-wide regulations that prevent increase in stormwater runoff with impact adjustment of 1.0 for the watershed upstream of project and design storm must be at least as large as the flood protection level for project; designing the project so that it performs to its design protection level based on the watershed that is fully built out/developed in accord w/ long-range plan; environmental compliance	Structural flood control technique used: Channel Modifications			



STRUCTURAL PROJECT GOALS

Storm Drain Improvements

Keep the channel and storage basin (detention or retention) portion of a community's drainage system clear of debris in order to maintain its flood-carrying and storage capacity during floods, and to protect water quality

- (1) Drainage system inspections—Credit for this activity is dependent upon annual inspection of the natural conveyance system and/or storage basins, and proper documentation of those inspections. The community (or other non-federal agency) must have a program to inspect its drainage facilities annually, upon receiving a complaint, and after each major storm. If all parts of the natural system cannot be inspected annually (for example, because there is no legal access to those parts of the streams that lie on private property or for budgetary reasons), then credit will be adjusted by the impact adjustment. Written records of inspections correlated to specific parts of the inventory are required for CRS credit.

- (2) Inspection and maintenance—The inspection and maintenance of the streams and storage basins can be provided by the community, another non-federal agency, or private property owners. Many communities are in flood control or drainage districts that perform this work. Whether the inspections and maintenance are performed by the community; a county, regional or state agency; or a private property owner, the Community Rating System (CRS) community is responsible for providing all the documentation needed to verify credit. An inventory and map of the system as well as written procedures and inspection records are required for CRS credit.

BACKGROUND



STRUCTURAL PROJECT GOALS

Storm Drain Improvements

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
If we determine whether any property protection or drainage improvements are feasible (see list of approved measures on page 360-2 and 510-20; document findings; summary of process that was followed; whether property owner was involved; general map w/statement of problems; table w/basic info for each bldg.; who, when, how of actions to be implemented;	Repetitive loss area analysis			



PUBLIC INFORMATION GOALS

Overall Summary

Public Information activities advise property owners, potential property owners, and visitors about the hazards, ways to protect people and property from the hazards, and the natural and beneficial functions of local floodplains. They are usually implemented by a public information office.

Example

- ▶ *420 – Open Space Preservation. If/when the city acquires and/or assembles property, consider a policy for a percentage that is to be set aside as perpetual open space. Use deed restrictions to ensure its perpetual.*



PUBLIC INFORMATION GOALS

- Map information
- Library
- Outreach projects
- Technical assistance
- Real estate disclosure
- Environmental education



PUBLIC INFORMATION GOALS

Map Information

We must have a program to regularly inspect, at least annually, public and private storage basins and remove debris as needed

BACKGROUND

Maps are an effective method of communicating information about flood hazards. Residents and businesses that are aware of potential flood hazards can take steps to avoid problems and/or reduce their exposure to flooding. Communities are the best source of map information because they can often supplement and clarify the Flood Insurance Rate Map (FIRM) with complementary maps, and with information on additional hazards, flooding outside mapped areas, development regulations that affect floodplain properties, flood insurance, natural floodplain functions, and property protection measures.

A map information service can greatly help a community's residents as well as its banks, insurance agents, real estate agents, and anyone else who needs flood hazard information. This public service is particularly helpful to those who have trouble reading maps, people from out of town, and those who do not have access to the latest maps or all the hazard information available in the community.

This activity is also intended to bring other available community resources to bear on each individual situation. Such resources include local topographic, planning, road, and utility maps; geographic information systems (GISs); maps of special flood-related hazard areas; permit records; and subdivision plats. Where they are available, these other resources can complement the FIRM as sources of additional flood data or more detailed map information.



PUBLIC INFORMATION GOALS

Map Information

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
advertise availability	Additional Map Data: SFHA, corporate limits, streets & lot boundaries			
advertise availability	Additional Map Data: buildings, building outlines or footprints			
advertise availability	Additional Map Data: floodways			
advertise availability	Additional Map Data: base flood elevations			
advertise availability	Additional Map Data: FIRM zone attributes			
advertise availability	Additional Map Data: 500-year floodplain elevations or boundaries			



PUBLIC INFORMATION GOALS

Map Information

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
advertise availability	Additional Map Data: other natural hazards			
advertise availability	Additional Map Data: topographic contour lines			
advertise availability	Additional Map Data: floodplain data in the tax assessment data base			
advertise availability	Additional Map Data: old FIRM's			
advertise availability	Additional Map Data: other regulations			
advertise availability	Additional Map Data: Natural floodplain functions			
advertise availability	Additional Map Data: building elevation data			
advertise availability	FIRM maintenance			



PUBLIC INFORMATION GOALS

Library

We must have a program to regularly inspect, at least annually, public and private storage basins and remove debris as needed

BACKGROUND



PUBLIC INFORMATION GOALS

Library

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
advising of the publications on hand at the library (9 required publications (see list in table 350-1 on page 350-3) housed/cataloged in Library - get updated letters from H'burg, USM both Cook/McCain library's; check w/Wm Carey and Lamar County and see if they have info or will add as well)	Flood protection library			
advise public of other items such as Flood Insurance Study, Hazard Mitigation Plan, Floodplain Management Plan and/or Ordinance, FIRM (1 point for each document) on hand at the library	Locally pertinent documents			



PUBLIC INFORMATION GOALS

Outreach projects

We must have a program to regularly inspect, at least annually, public and private storage basins and remove debris as needed

BACKGROUND



PUBLIC INFORMATION GOALS

Outreach projects

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
ongoing, but need to update "Known Flood Hazard Map" based on FMP input in step 4 - see "Preventive" possibly regulation	Other flood problems not shown on the FIRM/ Other Higher Standard/Higher Study Standard			
advertise availability	Natural floodplain functions			
update our current brochure and find other sources for distribution of info (see stakeholder delivery); maybe create brochure, etc. in English and Spanish	Outreach Projects			
create "Event Oriented" outreach - prepared in advance of event covering key messages that need to be disseminated before, during and after flood event)/adjusted annually to ensure info stays current (see table 330-1 on pg. 330-11) -other hazard types as well could be created - such as Tornado	Flood response preparation			
Contact any agency, organization or person (other than the community itself) that supports/initiates the message and is listed in the PPI plan. Schools that implement outreach activities; newspaper that publishes a flood or hurricane season supplement each year; neighborhood or civic association that sponsors/hosts a presentation by a community employee, utility company that includes pertinent articles in its monthly bills. insurance company that	Stakeholder delivery			



PUBLIC INFORMATION GOALS

Technical Assistance

We must have a program to regularly inspect, at least annually, public and private storage basins and remove debris as needed

BACKGROUND



PUBLIC INFORMATION GOALS

Technical Assistance

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
publicized annually; 1 on 1 w/citizen; qualified staff identified; records kept; PPI must include discussion of the service and recommendations on how should be conducted; FIA, CP and CPI are not required for this credit, but if plan is done, it must discuss providing technical assistance as a way to encourage people to purchase, maintain or improve their coverage	Technical Assistance.			



PUBLIC INFORMATION GOALS

Real Estate Disclosure

We must have a program to regularly inspect, at least annually, public and private storage basins and remove debris as needed

BACKGROUND



PUBLIC INFORMATION GOALS

Real Estate Disclosure

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
Ensure Real Estate Agents are inform potential purchasers of SFHA via property summary sheets, offer-to-purchase forms, Multiple Listing Service forms or others/whatever method it must state that property is in SFHA or not; it must tell inquirer that federal law requires flood insurance for federally backed mortgages -must specifically state that Flood Insurance is required; must be volunteered by the real estate office, not only when asked; seller's statement does not qualify, must state in SFHA not just whether or not seller experienced flood, must review real estate agents annually to evaluate and improve program	Disclosure of the flood hazard			
Talk w/local Agents and see if they would agree to handing out brochure that advises reader to check to see if property is in a flood zone (example: Brochure - Check before you buy: Know Your Flood Risk! see page 340-9 for sample language; also consider adding a small GIS flood map in brochure? - would show areas of SFHA, maybe even one w/drainage, street flooding, flash flooding, etc. layers on map) - We may have to provide to ensure they have/use? Determine how we could ensure compliance.	Real Estate agents' brochure			



PUBLIC INFORMATION GOALS

Environmental Education

We must have a program to regularly inspect, at least annually, public and private storage basins and remove debris as needed

BACKGROUND



PUBLIC INFORMATION GOALS

Environmental Education

What are we going to do???

GOALS	OBJECTIVE	ACTIONS	PROS	CONS
Heavy promotion provided for how the warning of potential dam failure will be disseminated to the public	Dam failure warning			
PPI specify message and recommend best way to disseminate info advising citizens of Stream Dumping Ordinance (possibly amend annual mailout)	Stream dumping regulations			



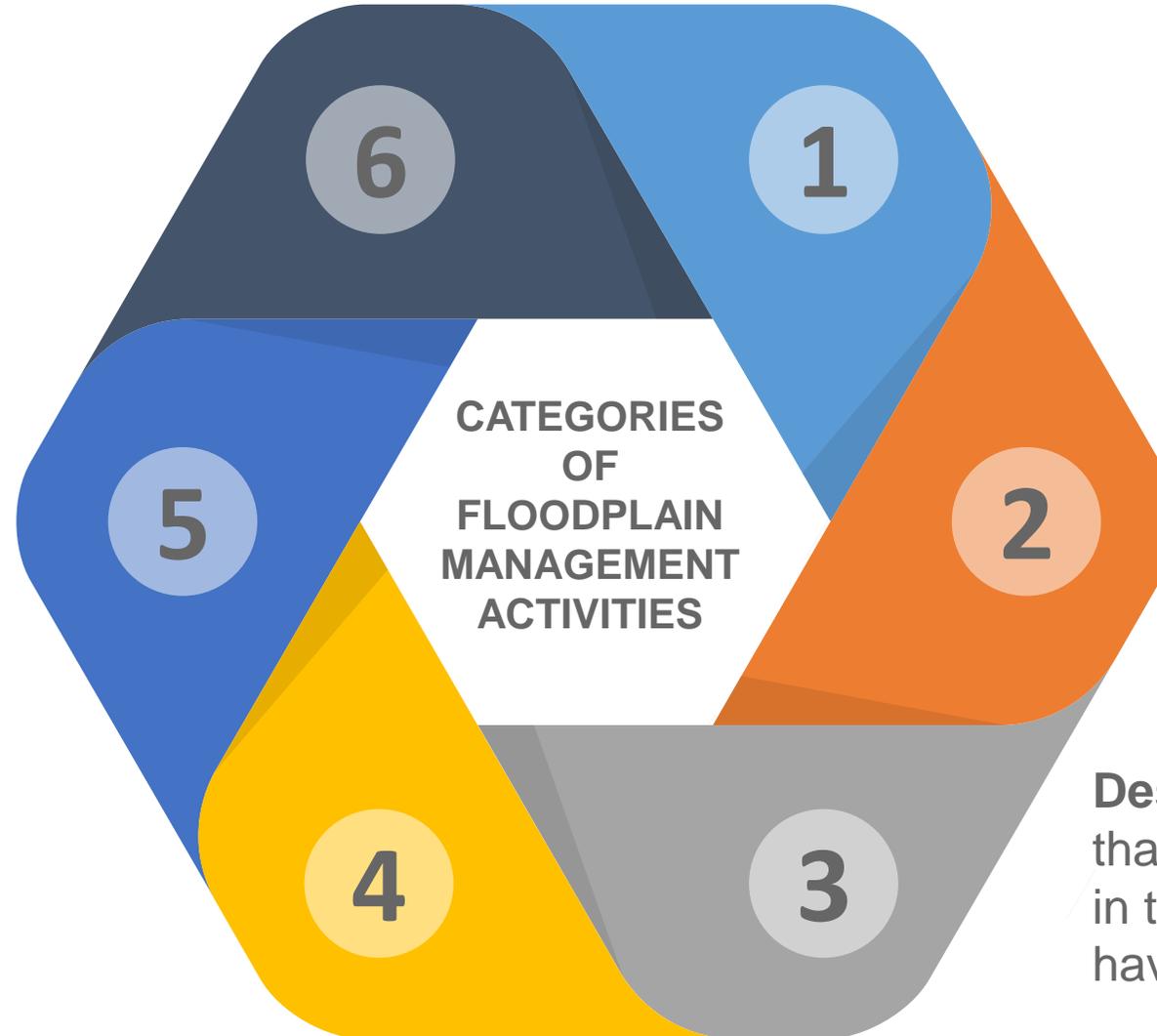
STATE OUR
GOALS
Of the HMP
and FMP

**A GOAL
WITHOUT
A PLAN
IS JUST
A WISH**



REVIEWING POSSIBLE ACTIVITIES

1. Preventive
2. Property Protection
3. Natural Resource Protection
4. Emergency Services
5. Structural Projects
6. Public Information



Describe the Impact that the hazards identified in the hazard assessment have



REVIEWING POSSIBLE ACTIVITIES

Fully describe all activities considered

and the discussion of why the activity is or is not appropriate for the community and its flood problems

Is it appropriate and/or feasible?

- ▶ The Community's capability to fund and implement the activity;
- ▶ For all currently implemented activities, the plan must note if the activity is achieving expectations and, if not, whether it should be modified; and
- ▶ If the plan is an update of a previously credited plan, each activity recommended by the previous plan must be discussed; along with the status of implementation.



PREVENTATIVE GOALS

Overall Summary

Preventative activities keep flood problems from getting worse. The use and development of flood-prone areas is limited through planning, land acquisition, or regulation. They are usually administered by building, zoning, planning, and/or code enforcement offices.

Example

- ▶ *420 – Open Space Preservation. If/when the city acquires and/or assembles property, consider a policy for a percentage that is to be set aside as perpetual open space. Use deed restrictions to ensure its perpetual.*



PREVENTATIVE GOALS

- Floodplain mapping and data
- Planning and zoning
- Open space preservation
- Stormwater management
- Floodplain regulations
- Drainage system maintenance
- Erosion setbacks
- Building codes

**ACCORDING TO THE CRS
COORDINATOR'S MANUAL,
FEMA PROVIDES ACTIVITY
RECOMMENDATIONS THAT
CORRESPOND TO EACH
CATEGORY.**



PREVENTATIVE GOALS

Planning and Zoning

Must have a zoning ordinance that identifies different development criteria and densities for different areas

There is additional credit for low density zoning in areas subject to special flood-related hazards.

Credit is provided for zoning areas of the regulatory floodplain to keep them substantially open. Zoning an area for agriculture, conservation, or large residential lots preserves more open space than allowing more intensive development.

LZ credit is available for undeveloped land within low-density zoning districts, as well as for areas developed in accordance with the density requirements within the regulatory floodplain. “Low-density” means that that size of the lots is at least 5 acres. For this element, it does not matter why an area is zoned for low density; what counts is the minimum lot size and lot coverage allowed in the zoning district.

The credit for low-density zoning is based upon the traditional zoning approach of setting minimum lot sizes for different zoning districts. The bigger the lot size, the less dense the floodplain development and the more credit provided. The credit also factors in lot coverage for non-residential zones.

BACKGROUND



PREVENTATIVE GOALS

Planning and Zoning

What are we going to do???

OBJECTIVE	MITIGATION ACTIONS CONSIDERED
Low-density zoning	ongoing - verify ordinance lot sizes - provides credit for zoning areas of the SFHA to keep them substantially open (examples: A-1 and A-2 zoning) based on ratio of lot size in ordinance x 60 + impact adjustment
Other Higher Standard	Amend LDC to require an evacuation plan for new residential subdivisions that exceed a certain number of units/street (designate number of minimum units)



PREVENTATIVE GOALS

Open Space Preservation

Prevent flood damage by keeping flood-prone lands free of development, and Protect and enhance the natural functions of floodplains.

BACKGROUND

Floods are natural processes and floodplains are necessary to every river and coastal system. A floodplain has been defined as any land susceptible to being inundated by flood waters. Floodplains can also be regarded as the land needed by a river or stream to convey and store flood waters or the coastal areas subject to inundation during a storm.

Preserving the floodplain as open space allows it to serve these primary natural functions and many other important functions. Keeping the floodplain free of development—free of buildings and infrastructure—means that there will be no flood insurance claims, no closed businesses, no homeless residents, no damaged infrastructure, and that the community can return to normal quickly after flooding occurs.



PREVENTATIVE GOALS

Open Space Preservation

What are we going to do???

OBJECTIVE	MITIGATION ACTIONS CONSIDERED
Deed Restrictions	do we want to place deed restrictions on any City owned vacant property we plan to keep? - see if we can contact State and work something out with the to place on State owned as well?
	<p>If/when the city acquires and/or assembles property, consider a policy for a percentage that is to be set aside as perpetual open space. Use deed restrictions to ensure its perpetual.</p> <p>Perhaps a policy could require a particular percentage for general property that the city acquires/assembles, and a higher percentage when the property is in a flood zone.</p> <p>I would be hesitant to pursue a policy of returning property to its “natural function” as open space. Too often, I suspect that we would be challenged with a lot being looked at as an overgrown lot, or being susceptible to illegal dumping or illicit activities once it becomes wooded again.</p> <p>When the city acquires property in a flood zone, we could also pursue lower density zoning if/when the lot size is appropriate or if we can assemble multiple properties for the purpose.</p> <p>If/when possible and appropriate, rezone flood zone properties to 5+ acre A-1.</p>



PREVENTATIVE GOALS

Stormwater Management

Prevent future development from increasing flood hazards to existing development, to protecting existing hydrologic functions within the watershed, and to maintain and improve water quality.

Because development typically results in an increase in the amount of runoff, stormwater management usually requires that a volume of flood water be stored onsite during the storm to prevent increased frequency and severity of flooding. It is released after the runoff subsides (stormwater DETENTION). A developer may store this excess runoff for a short time so that it may be used for irrigation or groundwater recharge or to reduce pollution (stormwater RETENTION). When retention is used for stormwater management, the retained runoff is not discharged to the stream system.

BACKGROUND

Detention does not reduce the amount of water flowing downstream; rather, it simply lets it out over a longer period of time to reduce the peak flow immediately downstream of the site. This can still cause flooding problems farther downstream and the additional volume of water can destabilize channel banks and cause other problems. Therefore, stormwater retention or extended detention is preferable to simple detention for peak flows. If stormwater retention is used, the community must ensure that adequate storage is again available within a reasonable time in case another storm occurs.



PREVENTATIVE GOALS

Stormwater Management

Prevent future development from increasing flood hazards to existing development, to protecting existing hydrologic functions within the watershed, and to maintain and improve water quality.

Other approaches, such as low-impact development regulations, can be used to reduce the total runoff that leaves a site as well as peak flows. These techniques help preserve a site's ability to absorb its runoff. Credit may be provided for other approaches to managing the impact of development on runoff, if the community can show that there is no increase in flood risk or erosion downstream.

BACKGROUND

Maintenance of these required facilities is vital—if they silt in or become clogged, they provide no flood protection benefits. Therefore, there are separate credits under Activity 540 for maintaining storage facilities. SMR credit is the sum of the credit for four sub-elements:

- Size of development (Section 452.a(1), SZ),
- Design storm used (Section 452.a(2), DS),
- Low-impact development regulations (Section 452.a(3), LID), and
- Public agency authority to inspect and maintain, at the owner's expense, private facilities constructed to comply with the ordinance (Section 452.a(4), PUB).

Communities are encouraged to check with their regional stormwater management agency to see if they can apply for credit based on the stormwater management program implemented by the regional agency.



PREVENTATIVE GOALS

Stormwater Management

What are we going to do???

OBJECTIVE	MITIGATION ACTIONS CONSIDERED
Stormwater management regulations	Consider amending our ordinance for new development to prevent/reduce the increase in runoff that results from urbanization from 10-year storm or larger. Must have watershed map w/total areas and calculate the area of watershed and area subject to regulations (portion in City limits for example) is part of the impact adjustment for this activity - Additional credit is available if the community addresses larger storms, and controls the total volume of runoff from new development, and broken down into 4 categories below (must have SZ and DS credit to receive any credit for SMR):
Size of Development regulated	Consider amending our Ord. to add regulations that clearly state ALL development is subject to regulations (prorated if only some types or sizes of development are regulated). A portion of watershed must be subject to a regulation that requires peak runoff from new development to be no greater than the runoff from the site in its pre-development condition and at a minimum regulate development of 5 acres or more or increases in impervious area of 20,000 sq. ft or more - do we also want to amend Ord to cover smaller areas?



PREVENTATIVE GOALS

Stormwater Management

What are we going to do???

OBJECTIVE	MITIGATION ACTIONS CONSIDERED
Design Storms used in regulations	Consider amending - Max credit if regulations clearly state that all discharges up to and including that from the 100-yr storm must be released at rates not exceeding the pre-development peak discharge - bonus credit for controlling the volume of runoff if regulations require retention of all runoff or if the total volume of water released, measured above half of the 2-year flow rate is no more than the pre-development volume - credit is for what size storm detention is designed for and additional credit if the volume is also controlled
Low-impact development	Consider amending our ordinance to encourage "Green" infrastructure practices or Stormwater Management Plan that requires use of "soft" techniques; partial credit if only regulate development of a certain size to minimize runoff using these techniques amended to have all development comply?
Public maintenance of required facilities	Establishing and enforcing maintenance procedures and City having authority to inspect, perform maintenance should owners not comply - see language in LDC and notes in 542.e to see if qualifies for credit



PREVENTATIVE GOALS

Stormwater Management

What are we going to do???

OBJECTIVE	MITIGATION ACTIONS CONSIDERED
Watershed Master Plan: Manage all storms up to and including the 100 year	additional credit if managing the runoff from "all storms" up to and including the 100-yr event to ensure that flood flows downstream of new development do not increase due to the development
Watershed Master Plan: Management of future peak flows and volumes	additional credit if plan provides onsite management of future peak flows and volumes so that they do not increase over present values
Watershed Master Plan: Manage all storms up to and including the 5-day event	additional credit if plan manages the runoff from "all storms" up to and including the 5-day event
Watershed Master Plan: Dedicated funding source to implement the plan	additional credit if the community has a funding source dedicated to implementing the plan's recommendations



PREVENTATIVE GOALS

Stormwater Management

What are we going to do???

OBJECTIVE	MITIGATION ACTIONS CONSIDERED
Watershed Master Plan: Plan meets all the criteria listed in Sec 452.b	Consider amending Stormwater Ordinance to add a Watershed Master Plan as broken down in WMP1-8 and all the requirements here: must have stormwater regulations through an adopted watershed master plan that evaluates the impact of future conditions for at least one watershed that drains into the community for multiple storm events, including the 100-yr storm; must identify the natural drainage system and constructed channels; must have adopted regulatory standards that require onsite management of runoff from all storms up to and including the 25-yr event that receive credit under SMR and manage future peak flows; "all storms" includes at a min. the 10-yr storm in addition to 25 yr. event; management of a 2-yr storm is recommended; plan must be current (within 5 yrs.) or City must evaluate the plan to ensure still applicable to current conditions



PREVENTATIVE GOALS

Floodplain Regulations

Protect existing and future development and natural floodplain functions that exceed the minimum criteria of the National Flood Insurance Program (NFIP).

Although the NFIP minimum standards provide a great deal of flood protection, damage can still result for many reasons:

- Estimates of flood heights are subject to various errors;
- Changes in weather patterns may alter flood heights;
- Buildings may be damaged by floods that exceed the predicted 100-year flood;
- Urbanization and other changes in the watershed can increase the flood hazard and flood frequency;
- Filling and other development in the floodplain can reduce storage and conveyance capacity, increasing flood hazards; and
- Filling and construction practices can damage or destroy valuable natural floodplain functions. For these reasons, and the fact that local situations vary, many communities adopt development standards that are higher than or supplement the minimum NFIP criteria. This activity provides credit for those regulatory standards.

BACKGROUND



PREVENTATIVE GOALS

Floodplain Regulations

What are we going to do???

OBJECTIVE	MITIGATION ACTIONS CONSIDERED
Other flood problems not shown on the FIRM/ Other Higher Standard/Higher Study Standard	Have Public Works review list of Known Hazard Areas and report possible solutions; determine if we want to regulate unsolvable as if in a special flood hazard area, requiring freeboard elevation - if so, send to FEMA for map amendment, adding these areas to the SFHA?
New Study/Higher study standards/Other Higher Standard/Open Space Incentive	Amend LDC and/or Flood Prevention Ordinance requiring all structures in a new Flood Inundation Area (established on State/Fed Permits) to be elevated to established Freeboard; map area and possibly submit to FEMA for map amendment OR just allow for "cluster" development whereby the inundation area stays green and allows the structures to be placed in/around but not in danger area
Higher study standards or Other Higher Standard	Amend LDC and/or Flood Prevention Ordinance to require new subdivisions with a dam to meet all the State and Federal requirements/obtain permits prior to local permitting.



PREVENTATIVE GOALS

Floodplain Regulations

What are we going to do???

OBJECTIVE	MITIGATION ACTIONS CONSIDERED
Local drainage protection or Other Higher Standard	All streets in City elevated above BFE - would it create "bowl" effect on property?
Other Higher Standard	Amend Flood Prevention Ordinance to prohibit floodproofing as a flood protection measure for ALL new buildings (we currently allow for commercial structures) (means all residential and commercial structures in a SFHA would have to be elevated to established freeboard)
Other Higher Standard	No new septic tanks in floodplains or flood zones. New streets in FP to be built at or above BFE. I saw a reference in the manual to "access to dry land" but don't know what that means exactly or if it could apply. Requiring evacuation plans if/when neighborhoods include flood zones (assuming the element only applies to those in a flood zone).



PREVENTATIVE GOALS

Floodplain Regulations

What are we going to do???

OBJECTIVE	MITIGATION ACTIONS CONSIDERED
Development limitations	split by 3 sections defined below (need to review current ordinance and determine financial burden on homeowners/developers if we increase regulations):
Prohibition of fill	Long Shot - would need ordinance language that prohibits fill; however, gives approx. 1/2 credit if developer provides compensatory storage which might be a good compromise?
Prohibition of buildings	Don't recommend at this time - Twin Forks development would be out if we adopted ordinance language that prohibits building
Prohibition of outdoor storage of materials	Need to identify what hazardous materials and amend ordinance language to prohibits all materials; other options: partial credit for only hazardous materials indoors or outdoors, or only indoors, but elevated



PREVENTATIVE GOALS

Floodplain Regulations

What are we going to do???

OBJECTIVE	MITIGATION ACTIONS CONSIDERED
Freeboard	Increase our Freeboard to 2, 2 1/2 or 3 foot; Also need to ensure ordinance states that all utilities including ductwork are elevated as well. (If we change from 1 ft to 1 1/2 feet we get credit for 2 feet and benefits home owner in rates - but need to determine if cost effective)
Enclosure limits	Amend Ord from 300 to 299 to meet new regulation - check for other need changes and verify all language as to non-conversion agreements are in ordinance per new regulations - only 2 in City that I was aware of when I retired, may not be any elevated buildings now - need site visit to verify



PREVENTATIVE GOALS

Drainage System Maintenance

Keeping our streams, channels, and storage basins clear of debris so that flood carrying and storage capacity are maintained

BACKGROUND

A community's drainage system consists of natural watercourses or channels; constructed storm drains, canals, and ditches; and detention/retention basins built to store high flows. In most cases, the actual channel of a natural stream will carry only the two-year flood, with larger flows being carried in the overbank area. Constructed channels are typically designed to carry larger floods than natural channels do, and communities usually have an active maintenance program for their constructed facilities. When a channel loses a portion of its conveyance capacity, overbank flooding occurs more frequently and flows reach higher elevations, potentially damaging nearby structures or causing increased channel erosion.

Even where floodplain regulations prevent construction from encroaching, streams can lose their carrying capacities as a result of the accumulation of debris, sedimentation, and the growth of unwanted vegetation. Detention and retention basins can lose their ability to store water if upstream sediment controls do not function properly or if there are highly erosive lands upstream.

One proven approach to preventing this reduction of capacity is a community program that routinely inspects and clears debris from the channels and basins. This work can be as simple as cleaning out culverts and removing trash, shopping carts, and similar debris that can dam a stream and cause flooding, even during small storms.



PREVENTATIVE GOALS

Drainage System Maintenance

What are we going to do???

OBJECTIVE	MITIGATION ACTIONS CONSIDERED
Channel Debris Removal	ongoing, but need to improve maintenance schedule
Channel Debris Removal	Inventory and map all channels in SFHA (or City-wide?), all USGS quadrangle and draining more than 40 contributing acres; large underground segments of the surface conveyance system need to be shown if they convey flow from a natural channel; on the map and inventory segments, portions or components of natural conveyance system must be identified; identify owner (city, state, private); and who inspects and maintains each segment
Stream dumping regulations	ongoing, but need to improve maintenance schedule
Stream dumping regulations	Update Resolution to ensure it designates a person responsible for complaints/monitoring/compliance and enforcement and abatement provisions



PREVENTATIVE GOALS

Drainage System Maintenance

What are we going to do???

OBJECTIVE	MITIGATION ACTIONS CONSIDERED
Problem site maintenance	Inventory and Map problem site maintenance locations (ex. "choke" points, chronic dumping, obstruction of flows or erosion/sedimentation problems , etc.) in all channels in SFHA (or City wide?)- set up more frequent inspections for better maintenance of these areas and identify in resolution



PROPERTY PROTECTION GOALS

Overall Summary

Property Protection activities are usually undertaken by property owners on a building-by-building or parcel basis.

Example

- ▶ *420 – Open Space Preservation. If/when the city acquires and/or assembles property, consider a policy for a percentage that is to be set aside as perpetual open space. Use deed restrictions to ensure its perpetual.*



PROPERTY PROTECTION GOALS

- Relocation
- Retrofitting
- Acquisition
- Sewer backup protection
- Building elevation
- Insurance



PROPERTY PROTECTION GOALS

Acquisition and Relocation

The Federal Emergency Management Agency (FEMA) administers three grant programs to assist communities in mitigating the effects of natural hazards: the Flood Mitigation Assistance (FMA) Program, the Hazard Mitigation Grant Program (HMGP), and the Pre-Disaster Mitigation (PDM) grant program.

BACKGROUND

Acquisition and relocation projects remove people and property from harm's way and reduce the community's costs for disaster response, recovery, and repair. The Federal Emergency Management Agency (FEMA) recognizes that the acquisition of buildings in the floodplain is especially effective at reducing flood losses because it is a permanent form of mitigation. Other government agencies also have found acquisition projects to be more cost effective than major flood control projects.

Acquisition and relocation (or demolition) of buildings also creates additional open space in the floodplain and allows those lands to return to their natural functions. Acquisition is the most effective mitigation alternative for addressing repetitive loss properties.



PROPERTY PROTECTION GOALS

Acquisition and Relocation

What are we going to do???

OBJECTIVE	MITIGATION ACTIONS CONSIDERED
Repetitive loss area analysis	detailed mitigation plan for RL area, specific guidance on how to reduce damage; see if any have been mitigated/removed; must address every address in the RL area; area mapped; contact other agencies for input, visit each building and collect basic data - drainage patterns, condition of structure, types of foundation; historic flood info; date of bldgs. ins claim and source of flooding; RLAA info must be adopted by Council separately



PROPERTY PROTECTION GOALS

Sewer Backup Protection

Don't let clogged sewers wreak havoc on your home

BACKGROUND

Most homeowners may not realize that they are responsible for the maintenance and repair of their house or sewer lateral—that is, the pipeline between the city sanitary sewer main (which is usually located in the street) and the building.

The sewer lateral is owned and maintained by the property owner and the homeowners responsibility includes any part of the lateral that extends into the street or public right of way. A cracked or deteriorated lateral or one filled with tree roots can allow groundwater to seep into the system, contributing to the problem.

For homeowners who want to insure themselves against sewer backups, coverage is available from most providers for a nominal cost.



PROPERTY PROTECTION GOALS

Sewer Backup Protection

What are we going to do???

OBJECTIVE	MITIGATION ACTIONS CONSIDERED



NATURAL RESOURCE PROTECTION GOALS

Overall Summary

Natural Resource Protection activities preserve or restore natural areas or the natural functions of floodplain and watershed areas. They are implemented by a variety of agencies, primarily parks, recreation, or conservation agencies or organizations.

Example

- ▶ *420 – Open Space Preservation. If/when the city acquires and/or assembles property, consider a policy for a percentage that is to be set aside as perpetual open space. Use deed restrictions to ensure its perpetual.*



NATURAL RESOURCE PROTECTION GOALS

- Wetlands protection
- Water quality improvement
- Erosion and sediment control
- Coastal barrier protection
- Natural area preservation
- Environmental corridors
- Natural area restoration
- Natural functions protection



NATURAL RESOURCE PROTECTION GOALS

Natural Area Preservation

Protect natural channels and shorelines

Natural channels and shorelines are the areas most valuable for protecting natural floodplain functions. They are important places for aquatic and riparian habitat. NSP credit is for allowing these areas to follow their natural processes, such as channel meandering and beach erosion, and to encourage natural shorelines that provide water quality benefits for runoff.

Note that a setback or buffer that prohibits buildings and filling can qualify as OSP but are not sufficient for NSP.

BACKGROUND

Programs to protect channels and shorelines in their natural state are credited in NSP. These include

- Regulations that govern development and construction, such as an ordinance or regulation that governs public and private construction activities; and
- Local policies followed on public lands, such as a written community policy that covers shorelines in city parks.

Protection credit is only available for channels or shorelines that are currently in their approximate natural state, i.e., there is no concrete, rip rap, levees, armoring, beach nourishment, dams, or other human intervention that constrains the natural processes of the shoreline of the river, stream, lake, or ocean.



NATURAL RESOURCE PROTECTION GOALS

Natural Area Preservation

What are we going to do???

OBJECTIVE	MITIGATION ACTIONS CONSIDERED
Watershed Master Plan: Natural areas to provide retention and detention	additional credit if plan identifies existing wetlands or other natural open space areas to be preserved from development to that natural attenuation, retention, or detention of runoff is provided
Watershed Master Plan: Prohibit alteration of existing natural channels	additional credit if the plan recommends prohibiting development, alteration or modification of existing natural channels and the community has adopted a qualifying ordinance
Watershed Master Plan: Projects must use natural or "Soft" approaches	additional credit if the plan recommends that channel improvements use natural or "soft" approaches rather than gabions, rip rap, concrete, or other "hard" techniques, and the community has adopted appropriate design standards or ordinances



NATURAL RESOURCE PROTECTION GOALS

Environmental Corridors

Protect one or more natural functions within the community's floodplain

BACKGROUND

- A habitat conservation plan that explains and recommends actions to protect rare, threatened, or endangered aquatic or riparian species.
- A habitat protection or restoration plan that identifies critical habitat within the floodplain, actions to protect remaining habitat, and/or actions to restore fully functioning habitat. Frequently this will result in the preservation and/or restoration of riparian habitat that is necessary for water-dependent species.
- A “green infrastructure plan” that identifies open space corridors or connected networks of wetlands, woodlands, wildlife habitats, wilderness, and other areas that support native species, maintain natural ecological processes, and/or sustain air and water resources (for credit, the corridors or networks must include some floodplains).
- A plan or section of a comprehensive or other community plan that includes an inventory of the ecological attributes of the watershed and/or the floodplain and recommends appropriate actions for protecting them, provided that the recommendations are implemented through a mechanism such as a development regulation, development order, grant program, or capital improvement plan.



NATURAL RESOURCE PROTECTION GOALS

Environmental Corridors

What are we going to do???

OBJECTIVE	MITIGATION ACTIONS CONSIDERED
Natural shoreline protection	Obtain inventory of all shorelines and what is natural vs hard surfaced (Hema has basic info, but we need to enhance) based on the length of shoreline affected by the natural shoreline protection regulations - setbacks and buffers do not qualify here, but do in OSP; programs that protect channels in their natural state are credited here - no concrete, rip rap, levees, etc. that constrains the natural process of the shoreline of the river, stream or lake
Natural floodplain functions plan	Create and adopt a plan that protects one or more natural functions: Examples: "Green" Infrastructure Plan; or section of Comprehensive Plan that includes inventory of ecological attributes of watershed and/or floodplain, recommends actions for protecting them and implemented through a grant, capital improvement plan or development regulation/order - extra credit in 420 if plan exists



EMERGENCY SERVICES GOALS

Overall Summary

Emergency Services measures are taken during an emergency to minimize its impact. These measures are usually the responsibility of city or county emergency management staff and the owners or operators of major or critical facilities.

Example

- ▶ *420 – Open Space Preservation. If/when the city acquires and/or assembles property, consider a policy for a percentage that is to be set aside as perpetual open space. Use deed restrictions to ensure its perpetual.*



EMERGENCY SERVICES

- Hazard threat recognition
- Critical facilities protection
- Hazard warning
- Health and safety maintenance
- Hazard response operations
- Post-disaster mitigation actions



EMERGENCY SERVICES

Critical Facilities Protection

Protect facilities that are critical to the community

There are usually two kinds of critical facilities that a community should address:

- Facilities that are vital to flood response activities or critical to the health and safety of the public before, during, and after a flood, such as a hospital, emergency operations center, electric substation, police station, fire station, nursing home, school, public works, vehicle and equipment storage facility, or shelter.
- Facilities that, if flooded, would make the flood problem and its impacts much worse, such as a hazardous materials facility, power generation facility, water utility, or wastewater treatment plant.

BACKGROUND

PCF credit is provided for regulations that either prohibit critical facilities in the 500-year floodplain or set higher standards for protecting them from flood damage. Full credit is for a prohibition on new critical facilities in the 500-year floodplain. It may not be feasible for some communities to locate critical facilities outside the 500-year floodplain, but they may be able to take some steps towards reducing future risk to these facilities, so partial credit is provided for regulations that allow new facilities in the 500-year floodplain, but set higher protection standards for them. If the standards only apply to some facilities or some parts of facilities, the credit will be prorated. For example, partial credit would be provided if the regulations addressed only one type of critical facility, such as hazardous materials sites or critical facilities owned and managed by the community.



EMERGENCY SERVICES

Critical Facilities Protection

What are we going to do???

OBJECTIVE	MITIGATION ACTIONS CONSIDERED
Protection of critical facilities	Re-do (ck what's in Hazard Mitigation Plan for possible updated info?) - facilities vital to flood response or to the health/safety of public before, during and after a flood, such as hospital, EOC, electric substation, police/fire stations, nursing home, schools, public works, vehicle/equipment storage facilities or shelters; also hazardous material storage facility, power generation facility, water utility or wastewater treatment plant; prohibit in 100 & 500 year zone - partial credit if allowed in 500 yr. but protection measures are required - prorated credit if only some types of facilities are covered in our regulations
	Flood threat recognition system – prediction system with arrival times. I don't know if the current system does this or not. I'll also be interested to hear from public works and water & sewer and parks & rec on flood response operations that are already in place. Also critical facilities planning.



STRUCTURAL PROJECT GOALS

Overall Summary

Structural projects keep flood waters away from an area with a levee, reservoir, or other flood control measure. They are usually designed by engineers and managed or maintained by public works staff.

Example

- ▶ *420 – Open Space Preservation. If/when the city acquires and/or assembles property, consider a policy for a percentage that is to be set aside as perpetual open space. Use deed restrictions to ensure its perpetual.*



STRUCTURAL PROJECT GOALS

- Reservoirs
- Channel modifications
- Levees/floodwalls
- Storm drain improvements
- Diversions



STRUCTURAL PROJECT GOALS

Storm Drain Improvements

Keep the channel and storage basin (detention or retention) portion of a community's drainage system clear of debris in order to maintain its flood-carrying and storage capacity during floods, and to protect water quality

(1) Drainage system inspections—Credit for this activity is dependent upon annual inspection of the natural conveyance system and/or storage basins, and proper documentation of those inspections. The community (or other non-federal agency) must have a program to inspect its drainage facilities annually, upon receiving a complaint, and after each major storm. If all parts of the natural system cannot be inspected annually (for example, because there is no legal access to those parts of the streams that lie on private property or for budgetary reasons), then credit will be adjusted by the impact adjustment. Written records of inspections correlated to specific parts of the inventory are required for CRS credit.

BACKGROUND

(2) Inspection and maintenance—The inspection and maintenance of the streams and storage basins can be provided by the community, another non-federal agency, or private property owners. Many communities are in flood control or drainage districts that perform this work. Whether the inspections and maintenance are performed by the community; a county, regional or state agency; or a private property owner, the Community Rating System (CRS) community is responsible for providing all the documentation needed to verify credit. An inventory and map of the system as well as written procedures and inspection records are required for CRS credit.



STRUCTURAL PROJECT GOALS

Storm Drain Improvements

What are we going to do???

OBJECTIVE	MITIGATION ACTIONS CONSIDERED
Stream dumping regulations	Post signs at all problem sites (check costs)
Problem site maintenance	Identify possible resolutions to any problem sites (ex: "choke" points, chronic dumping, obstruction of flows or erosion/sedimentation problems, etc.) - possibly modifying the channel to eliminate choke points or other problem sites
Repetitive loss area analysis	If we determine whether any property protection or drainage improvements are feasible (see list of approved measures on page 360-2 and 510-20; document findings; summary of process that was followed; whether property owner was involved; general map w/statement of problems; table w/basic info for each bldg.; who, when, how of actions to be implemented;



EXISTING GOALS

Floodplain Management Goals

Where are we now???

Goals	MITIGATION ACTIONS
Address 7 Repetitive Loss Properties	At least 1 structure has been demolished
Increase Floodplain Education	Our Annual Outreach is continuously updated to ensure the public is up to date on all flood issues.
Provided Continuous Drainage Work	We are currently revising our Drainage Maintenance Policies.
Revise Floodplain Ordinance	Continue to revise our ordinance most recently in January 2018.
Continue Coordination with Other Agencies	Ongoing



EXISTING GOALS

Hazard Mitigation Goals

Where are we now???

Goals	MITIGATION ACTIONS
Encourage the development and maintenance of facilities and infrastructure that will mitigate hazards.	<ul style="list-style-type: none">• Elevate Floodprone Properties• Retrofit and/or construct safe rooms in area schools• Provide four railroad grade separations (overpasses)• Critical Facilities located in SFHA relocation• Stream corridor reforestation along river and stream beds• Actively pursue and buy repetitive loss properties
Foster an ongoing community education program on hazard mitigation safety and preparation.	<ul style="list-style-type: none">• Educate the general public on potential hazards, stormwater management, and storm preparedness• Flood Insurance Education Program targeting real estate and financial professionals
Enhance response procedures and capabilities.	<ul style="list-style-type: none">• Review and update evacuation routes within the county• Placement of portable cell towers for emergency workers• Mitigate critical facilities with generators• Alert citizens of life threatening events through sirens and NOAA weather radios.• Equipment purchase for debris removal after storm events• Provide portable, digital traffic flow signs for public communications
Utilize technology to protect and develop records and data.	<ul style="list-style-type: none">• Enhance website to notify citizens of disasters



FLOODPLAIN MANAGEMENT PLANNING COMMITTEE

Public Hearing - September, 13 2018

SIGN IN SHEET

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FLOODPLAIN MANAGEMENT PLANNING COMMITTEE

Public Hearing -- September 13, 2013
COMMENT SHEET

Name:

Ginger

Address:

Planner

COMMENTS:

→ Revolving loan program for Elevation for Floodzone Residents achieves following goals - ① keeps ppl in their N'hood ② lowers Insurance ③ Safer structure ④ hire local workers for work to keep \$ local ⑤ Reinvest in N'hood
↳ ADP SIMKIK fund?

Public Education - Public meeting/workshop to educate homeowners on Flood Insurance taught by local insurance Agents



Minutes: 9-13-2018 Meeting

The meeting was called to order by Andrew Ellard. Attendance sheets attached.

Prayer: Andrew Ellard

Mayor Barker requested a motion to approve the minutes from the last meeting, but they were not yet available.

Goals for the committee are discussed below (details in PowerPoint Presentation).

Property protection goals/activities are usually undertaken by property owners on a building-by-building basis. Characteristics are relocation, retrofit, acquisition, sewer back-up protection, building elevation and insurance.

FEMA provides three grant programs to assist communities in mitigating the effects of natural hazards—the Flood Mitigation Assistance Program, the Hazard Mitigation Grant Program and the Pre-Disaster Mitigation Grant Program.

The City's interest will focus on acquisition and relocation.

There are 22 active, repetitive loss properties. The Mayor asked about the repetitive loss area analysis procedures. Lisa Reid said the RLAA would define properties to include with the area of identified repetitive loss properties, evaluate each area as to building types, problem types, etc. and make recommendations to Council in the form of an RLAA Plan as to potential remediation measures. The Council would decide which measures to explore and authorize the committee on which measures they want to pursue.

Andrew Ellard asked for clarification as to properties that are included in the adopted plan. Lisa Reid stated when properties are “adopted”, that does not mean they would be taken over and residents have to move. The Acquisition/Relocation program is voluntary; however, the City has the option to make a buyout mandatory if conditions are serious enough. There are active and inactive properties on the RL list, and only FEMA can add or remove a property. Lamar Rutland asked what the criteria is for a property to be placed on the list. Mrs. Reid said if a property has flooded more than twice within ten years, FEMA puts the property on the list (information comes from residents' insurance claims that are turned in to FEMA). FEMA declares a property a repetitive loss property, not the City. We have 130 something properties on the RL list; however, documentation as to drainage improvements and some demolitions, have removed all, but the 22 active properties. They are not actually removed from the list, but declared active or inactive accordingly.

Nick Williams discussed sewer back-up protection. He and Lisa Reid have a scheduled meeting with Alan Howe next week, and information from the meeting will be e-mailed to committee members.

The next category discussed was natural resources protection goals, which are to restore natural areas of floodplain and watershed areas. Some of the objectives are proposing and implementing a watershed master plan (additional credit) and identifying existing wetlands or other open space preservation (information is derived from a comprehensive engineering study). Natural or soft approaches must be utilized.

Mayor asked if work has begun on a watershed mater plan, and Lamar Rutland said some discussions have been held on existing natural channels, stream buffers along Gordon Creek and hard approaches in stabilizing the creek.

Ross Bell asked when a stream is cleaned out, is its development changed or altered. Lamar Rutland said if the natural path of the water flow is changed, or if some kind of concrete retainage structure is placed over the stream, that would be redevelopment or alteration. If the stream is grated or grass is left and it remains mostly dirt or trees, it would not be changed. If it is made deeper, that would be a change. If a stream is cleaned out, *how* it is done would make it questionable. Mayor said the work being done on S 34th Avenue is removing silt, etc.; that is regular maintenance--it is not altering. If the stream had been dug five feet deeper, it would be an alteration.

The next category is environmental corridors. This category involves protecting natural and hard surfaces. Lisa Reid said a lot of the activities overlap, but the City would receive a portion of credit for whichever category is involved.

NICK READING (Look at PowerPoint and see if we can figure out what was discussed here??? – I think would have been reading about the channel improvement/alteration?? Must have said something about closed drainage areas due to next comments:

Ginger Lowrey said would this be discouraging the closing of our natural drainages. Lisa Reid said not necessarily; in some areas that is the best thing to do. We just need to review each one individually. Mrs. Lowrey then asked who would be the reviewer, and Mrs. Reid responded that she would review the pros and cons of the areas. **(again, need to see what was being discussed that I would make this comment???)**

The next category was natural floodplain plan. The committee's objective is to create and adopt a plan that would protect one or more natural functions such as the green infrastructure plan, a section of our comprehensive plan which includes inventory, etc. Lisa Reid said per Lamar we do have some green practices in the land code, but they are only recommended policy, not a requirement, so the City would probably not get any credit on existing code.

The next category is emergency services. Emergency services are services taken during an emergency to minimize its impact. This is the responsibility of all entities---city, county, emergency management staff, and owners or operators of other major critical facilities. Recently an agreement was made with a communications company that will handle some of the broader issues but will also focus on emergency responses as well.

Ann Jones asked about the emergency action plan. Paul Sheffield said the current EOC comprehensive plan covers all hazards. Specific emergency action plans, are written specifically for different disaster types, and are supplements or annexes to the comprehensive action plan. I incident specific annexes are

in the plan, such as hurricanes, but there is not one specifically for flooding. Ann Jones will spearhead the creation of an annex for flooding in the City, and request EOC to adopt as well.

Lisa Reid said she would like for each department to make sure their individual emergency plans are current, and the Mayor said he already had this in the works..

Critical facilities include substations, EOC, hospitals, police/fire stations, schools, public works, nursing homes, etc. Mayor asked if we have a practical application. Lisa Reid said currently there are about 150 county-wide facilities and most are government buildings. The ordinance currently allows the 500-year zone (partial credit), and administration said it would be a hardship to change that because there is often no other place to put them except in the flood zone. If there is a change, protection measures need to be in place. Mrs. Reid advised that if we allow in 500 year with regulations, it is her recommendation that not only the buildings be protected but also streets because ingress and egress are issues to be considered. Tree removal could also be a problem because vehicles would need to get in and out. The list needs to be updated to make sure it is current. Lisa Reid asked about current facility contact information; EOC should have this this, but Paul Sheffield stated info is slightly outdated and needed to be revised. It was agreed that the committee with staff assistance would begin the update of critical facilities as soon as possible.

Nick said he would like to hear from public works, water and sewer and parks and recs to find out what operations are already in effect. Keith Parks said Public Works' operations are currently in place. They are already cleaning a lot of ditches and using herbicides to remove weeds, etc. Lisa Reid said to be sure to document everything that is being done; maintenance routes and frequency are important.

Kahdijah Muhammad asked more about facilities. Paul Sheffield said the Red Cross shelter is the only certified shelter location for evacuees.

The next category is structural project goals. They keep flood waters away from an area with a levee, reservoir or other flood control measures.

Structural goals for the committee are as follows:

1. Enforce stream dumping regulations such as having signs at problem sites. Mayor asked how many we have but Lisa Reid said she did not know; maybe Public Works could assist with that.
2. Proper site maintenance—identifying possible resolutions to feed from such as choke points and obstruction of flows.
3. Repetitive loss area analysis—determine where property protection and drainage improvements are feasible; determine whether property owners are involved, etc., and how these actions will be implemented.

Current existing goals are (1) address 22 repetitive loss properties (one structure has been demolished); (2) floodplain education (getting the message out to the general public); (3) providing drainage work—determining what needs to be done; and (4) revising the floodplain ordinance. Mrs. Reid said these items were based on the last 1999 floodplain management goals. Other items on the list are from 2007 HMP, and they were updated in 2013 or 2014. Goals from the 1999 FMP and current HMP plans will be updated and incorporated into one.

HMP Goals were recapped and status of each was reported.

Mrs. Reid said a lot of these existing goals from both plans have been done. Mayor asked how much do we get if he puts in a railroad grade separation mentioned in the HMP plan. Mrs. Reid told him a major project, protecting many properties, would be big points.

Mayor asked what the project's timeline is. Lisa Reid said this plan needs to be adopted by the end of October because it has to be submitted by the end of November. It has to be placed on the agenda for the first meeting in November and then a public hearing must be held.

At the next meeting more goals will be broken down from the last two meetings such as utilizing the current staff or need for more staff, salaries, budget needs over this year, next year, 3 to 5 years, funding goals, identifying who will be responsible, how work will be done, etc.

Mayor asked about the cost of flood insurance. Mrs. Reid stated that if the rate comes down, more people will purchase it. Mayor asked is there any kind of model for local flood insurance coverage so money will stay in the community. Mrs. Reid said they are not aware of any but can do research.

Mayor discussed finding a way for residents to pay into a flood insurance program that would help to lower the cost--what are people to pay in flood areas to help make neighborhoods more viable again and bring economic growth. Lisa Reid added that she and Nick Williams found on line a flood insurance calculator which could compute the amount for flood insurance, which would be helpful in outreach, but knew of no programs like this.

Kahdijah Muhammad stated when property value is low and insurance is based on the value of the home, coverage will be low. This is the concern of a lot of people in which she has been in contact. Mrs. Reid said this could be listed as a goal.

Ginger Lowery asked about a community revolving loan fund for elevating structures in the flood zone. Criteria could be income, personal funds, need of the structure, limitations on reinvestment due to value of structure ("substantial improvement", County tax assessment), must be in designated flood zone. Could be set up through local non-profit or foundation for management at a zero or low interest. Benefits of elevating through this fund include the following:

1. Improve safety of the structure by reducing the flood risk
2. Lower flood insurance costs by elevating structure
3. Keeps people in their communities, many of which are historic or established through multiple generations
4. Allows increased investment in a structure by property owners by eliminating the "substantial improvement" limitation.
5. Allows increased investment in a neighborhood overall
6. Requiring work to be done by a "local" contractor would keep the investment in the community. Could also require the work to be done by independently owned companies, minority owned companies, etc.

It would be good for a non-profit to do start-up, and Mayor said ADP/SEMCIC would be a good place to start.

Referring back to the health and safety discussion, Kahdijah Muhammad provided info on how natural disasters affect millions world-wide with mental health and substance use – behavioral health conditions –

in children and adolescents. We will further investigate the “Supplemental Research Bulletin” info she provided, and see what we can address for this issue as well.

Mayor requested a motion to adjourn. Lamar Rutland offered a motion to adjourn. Motion was second by Major Sims.



FLOODPLAIN MANAGEMENT PLANNING COMMITTEE

Meeting 7 - September 27, 2018

Train Depot Conference Room

4:00 – 5:30

1. Call to Order
2. Prayer
3. Minutes
4. Prioritize our Goals
5. Questions/Answers
6. Next meeting announcement – Oct 25th
7. Adjourn



STATE OUR
GOALS
Of the HMP
and FMP

A GOAL
WITHOUT
A PLAN
IS JUST
A WISH



REVIEWING POSSIBLE ACTIVITIES

Review Preventive Activities

such as zoning and land use ordinances, floodplain management regulations, storm water management regulations, building codes, subdivision ordinance, preservation of open space, comprehensive plans and the effectiveness of current regulatory and preventive standards and programs that could prevent or reduce the severity of the problems identified in the Problem Assessment.

Review should include:

- ▶ How these tools can reduce future flood losses;
- ▶ The current standards in the community's plans and regulations;
- ▶ Whether the community should adopt or revise such plans and regulations;



REVIEWING POSSIBLE ACTIVITIES

1. Preventive
2. Property Protection
3. Natural Resource Protection
4. Emergency Services
5. Structural Projects
6. Public Information



Describe the Impact
that the hazards identified in
the hazard assessment have



PROPOSED GOALS

Goals	MITIGATION ACTIONS	Prioritized (1-5)
1 Encourage the development and maintenance of facilities and infrastructure that will mitigate hazards.	<ul style="list-style-type: none"> Elevate Floodprone Properties Retrofit and/or construct safe rooms in area schools Provide four railroad grade separations (overpasses) Critical Facilities located in SFHA relocation Stream corridor reforestation along river and stream beds Actively pursue and buy repetitive loss properties Address Repetitive Loss Properties 	1. Enact/Amd Ord 2018 2. Activate 1-2 yrs 3. Activate within 3-5 yrs 4. Funding Source needs identifying 5. Not Feasible at this time
2 Foster an ongoing community education program on hazard mitigation safety and preparation.	<ul style="list-style-type: none"> Educate the general public on potential hazards, stormwater management, and storm preparedness Flood Insurance Education Program targeting real estate and financial professionals 	
3 Enhance response procedures and capabilities.	<ul style="list-style-type: none"> Review and update evacuation routes within the county Placement of portable cell towers for emergency workers Mitigate critical facilities with generators Alert citizens of life threatening events through sirens and NOAA weather radios. Equipment purchase for debris removal after storm events Provide portable, digital traffic flow signs for public communications 	
4 Utilize technology to protect and develop records and data.	<ul style="list-style-type: none"> Enhance website to notify citizens of disasters 	
5 Continue Coordination with Other Agencies	<ul style="list-style-type: none"> Ongoing 	

OBJECTIVE	MITIGATION ACTIONS CONSIDERED	GOAL	PRIORITY
Low-density zoning	When the city acquires property in a flood zone, we could also pursue lower density zoning if/when the lot size is appropriate or if we can assemble multiple properties for the purpose.	1	2
Other Higher Standard	Amend LDC to require an evacuation plan for new residential subdivisions that exceed a certain number of units/street (designate number of minimum units)	3	2
Deed Restrictions	Place deed restrictions on any City owned vacant property we plan to keep? - see if we can contact State and work something out with the to place on State owned as well?	0	5
	If/when the city acquires and/or assembles property, consider a policy for a percentage that is to be set aside as perpetual open space. Use deed restrictions to ensure its perpetual.	1	2

OBJECTIVE	MITIGATION ACTIONS CONSIDERED	GOAL	PRIORITY
Public maintenance of required facilities	Establish and enforce maintenance procedures and City having authority to inspect, perform maintenance should owners not comply - see language in LDC and notes in 542.e to see if qualifies for credit	1	2 (refer to Lamar's info sent to Ginger)
Watershed Master Plan:	Consider amending Stormwater Ordinance to add a Watershed Master Plan	1	Phase 1 2 Other Phases 3
Other flood problems not shown on the FIRM/ Other Higher Standard/Higher Study Standard	Have Public Works review list of Known Hazard Areas and report possible solutions	1	2
	Determine if we want to regulate unsolvable as if in a special flood hazard area, requiring freeboard elevation - if so, send to FEMA for map amendment, adding these areas to the SFHA?	0	5
New Study/Higher study standards/Other Higher Standard/Open Space Incentive	Amend LDC and/or Flood Prevention Ordinance requiring all structures in a new Flood Inundation Area (established on State/Fed Permits) to be elevated to established Freeboard; map area and possibly submit to FEMA for map amendment	1	1
	Allow for "cluster" development whereby the inundation area stays green and allows the structures to be placed in/around but not in danger area OR BOTH		
Higher study standards or Other Higher Standard	Amend LDC and/or Flood Prevention Ordinance to require new subdivisions with a dam to meet all the State and Federal requirements/obtain permits prior to local permitting.	1	1

OBJECTIVE	MITIGATION ACTIONS CONSIDERED	GOAL	PRIORITY
Channel Debris Removal	Inventory and map all channels City-wide, all USGS quadrangle and draining more than 40 contributing acres; large underground segments of the surface conveyance system need to be shown if they convey flow from a natural channel; on the map and inventory segments, portions or components of natural conveyance system must be identified; identify owner (city, state, private); and who inspects and maintains each segment	1	2
Problem site maintenance	Inventory and Map problem site maintenance locations (ex. "choke" points, chronic dumping, obstruction of flows or erosion/sedimentation problems , etc.) in all channels in SFHA (or City wide?)- set up more frequent inspections for better maintenance of these areas and identify in resolution	1	2
Repetitive loss area analysis	detailed mitigation plan for RL area, specific guidance on how to reduce damage; see if any have been mitigated/removed; must address every address in the RL area; area mapped; contact other agencies for input, visit each building and collect basic data - drainage patterns, condition of structure, types of foundation; historic flood info; date of bldgs. ins claim and source of flooding; RLAA info must be adopted by Council separately	1	2
Repetitive loss area analysis	If we determine whether any property protection or drainage improvements are feasible (see list of approved measures on page 360-2 and 510-20; document findings; summary of process that was followed; whether property owner was involved; general map w/statement of problems; table w/basic info for each bldg.; who, when, how of actions to be implemented;	1	2

OBJECTIVE	MITIGATION ACTIONS CONSIDERED	GOAL	PRIORITY
Natural shoreline protection	Obtain inventory of all shorelines and what is natural vs hard surfaced (Hema has basic info, but we need to enhance) based on the length of shoreline affected by the natural shoreline protection regulations - setbacks and buffers do not qualify here, but do in OSP; programs that protect channels in their natural state are credited here - no concrete, rip rap, levees, etc. that constrains the natural process of the shoreline of the river, stream or lake	1	2
Natural floodplain functions plan	Create and adopt a plan that protects one or more natural functions: Examples: "Green" Infrastructure Plan; or section of Comprehensive Plan that includes inventory of ecological attributes of watershed and/or floodplain, recommends actions for protecting them and implemented through a grant, capital improvement plan or development regulation/order - extra credit in 420 if plan exists	1	2
Protection of critical facilities	Re-do (ck what's in Hazard Mitigation Plan for possible updated info?) - facilities vital to flood response or to the health/safety of public before, during and after a flood, such as hospital, EOC, electric substation, police/fire stations, nursing home, schools, public works, vehicle/equipment storage facilities or shelters; also hazardous material storage facility, power generation facility, water utility or wastewater treatment plant; prohibit in 100 & 500 year zone - partial credit if allowed in 500 yr. but protection measures are required - prorated credit if only some types of facilities are covered in our regulations	3	2
Flood threat recognition system	Prediction system with arrival times. I don't know if the current system does this or not. I'll also be interested to hear from public works and water & sewer and parks & rec on flood response operations that are already in place. Also critical facilities planning. Need to obtain copies from each department of their emergency response plans.	3	1
Stream dumping regulations	Post signs at all problem sites (check costs)	2	1
Problem site maintenance	Identify possible resolutions to any problem sites (ex: "choke" points, chronic dumping, obstruction of flows or erosion/sedimentation problems, etc.) - possibly modifying the channel to eliminate choke points or other problem sites	1	2

OBJECTIVE	MITIGATION ACTIONS CONSIDERED	GOAL	PRIORITY
Drainage Protection	We currently have an ordinance that prohibits nurserymen from blowing yard debris into the streets and/or drains, we need stricter enforcement and fines assessed to eliminate this.	1	1
	If the containerization ordinance does not prohibit residential property owners from blowing debris into the streets, can we create an ordinance similar to the nurserymen ordinance. Also address other businesses, such as concrete trucks washing down trucks into drains – this is a real problem.	1	2
	Revise setbacks in existing lots in SFHA that are not of typical sizing	1	2
	Take large areas of city land and consider retention basins	1	2
	Increase buffers along streams and rivers	1	3
	Re-establish Tree Ordinance	1	1
	Mill streets when repaving, so that drains are not partially covered by new street layer	1	1

OBJECTIVE	MITIGATION ACTIONS CONSIDERED	GOAL	PRIORITY
	<p>Revolving loan fund for elevating structures in the flood zone Criteria could be income, personal funds, need of the structure, limitations on reinvestment due to value of structure(“substantial improvement”, County tax assessment), must be in designated flood zone. Could be set up through local non-profit or foundation for management at a zero or low interest. Benefits of elevating through this fund include:</p> <ol style="list-style-type: none"> 1. Improve safety of the structure by reducing the flood risk 2. Lower flood insurance costs by elevating structure 3. Keeps people in their communities, many of which are historic or established through multiple generations 4. Allows increased investment in a structure by property owners by eliminating the “substantial improvement’ limitation. 5. Allows increased investment in a neighborhood overall 6. Requiring work to be done by a “local” contractor would keep the investment in the community. Could also require the work to be done by independently owned companies, minority owned companies, etc. 	1	4
	Tax Abatement – Attempted but denied by State. Will keep searching for other alternatives.	1	4
	Outdoor water spaces for recreation and river walks (reference existing plans/studies on Twin Forks, East Hardy, and Gordon’s Creek)	1	4
	Prepare a comprehensive inventory of housing in the floodplain by quality (dilapidated, elevated, good standing, etc.)	1	3
	Reference all projects (existing/proposed) to current Comprehensive Plan 2008-2028 (Especially the Action Plan items)	1	2
	Develop partnerships with local universities for future studies (Just to name a few: master planning, economic development, architectural/site analysis, environmental/health studies, etc.)	5	2
	Continue coordination with Forrest/Lamar Counties, City of Petal, and state agencies for joint projects	5	2



EQUIPMENT NEEDS (Must Haves)

1. Adequate vacuuming equipment for keeping leaves off the streets and out of drains.
– Mayor said proposed for 2021
2. Ipads for any department that requires fieldwork and can streamline to our current workflow – Mayor said to submit needs
3. Outreach Project Budget (Printing and Postage) – Mayor said would come out of Public Info Officer's budget



Minutes: 9-27-2018 Meeting

Committee reviewed all Mitigation Actions considered, and identified a Goal and the Priority for each.

Insert goals/prority list from PowerPoint

List of each action considered **(again cut and paste from PowerPoint.)**



2018

FLOODPLAIN MANAGEMENT PLAN DRAFT

CREATED BY THE 2018 FLOODPLAIN MANAGEMENT PLAN COMMITTEE

PREPARED BY

NICHOLAS WILLIAMS AND LISA REID

Leaf River

Background

Our Resolution, documented in FMP1, designated the Committee members in general. The names, and designation, of each actual member is recapped in the table to the right.

The FMP Committee meet a total of seven (7) times, all meetings were open to the public and advertised on our website and through public media. Each meeting was recorded as a live feed on the City's Facebook page for the public as well. As explained in FMP and FMP1, although we won't specifically adopt a resolution for a multi-jurisdictional plan until early 2019, we did follow all the FMP steps and included the intent to combine the two plans in the resolution adopted in March 2018.

Most of the PPI members also served on the FMP Committee (indicated on member list above). The only exception was Michael Anderson, Realtor, who was added due to his expertise in the Real Estate field.

The Mayor held multiple Town Meetings with Neighborhood Associations in advance of the commencement of the FMP Committee meetings, and minutes are available upon request.

The draft plan and full modification application was presented to the FMP Committee on November 15th for committee and public input. This meeting was open to the public and advertised on our website, notice to Neighborhood Associations and _____ other – facebook??

Revisions were made, and the draft plan and application were placed on the Council's work session agenda on November 19th. The work session is also open to the public and allows the Mayor to present the modification and FMP to the Council in full to discuss any questions and/or concerns they may have on the proposed documents and goals. Notes were taken for proposed changes and the final draft of the application and FMP were submitted for the December 17th work session for final review and set for adoption on December 18, 2018.

Early in the planning process, Nick Williams, CRS Coordinator, spoke about the plan and the input needed to the Council of Neighborhoods. This is a group that has representation from each of the Neighborhood Associations and meets _____ to keep up-to-date on all City activities.

The draft's were also placed on the City's website, Facebook webcast.

Barker, Toby, Mayor	Committee Chair
Adams, Wilma	Citizen
Bell, Ross	Citizen
Burns, Dawn	Staff (Accounting Department)
Delgado, Deborah	City Councilwoman (Ward 2)
Edmondson, Chad	Citizen
Gopalan, Hema and Hobgood, Grant	Staff (GIS)
Hasan, Nadir	Citizen (Twin Forks Development Representative)
Heath, Margaret and Mellard, Judy	Citizen (Hattiesburg Housing Authority)
Hill, Colton and Parks, Keith	Staff (Public Services)
Jones, Ann	Staff (Chief Administrative Officer)
Lott, Myron	Staff (Parks and Recreation)
McCain, Samantha	Staff (Public Information Officer/PPI)
Muhammad, Khadijah	Staff/Stakeholder (Municipal Court/Red Cross Rep)
Reid, Lisa	Staff/Citizen (Consultant/Floodplain Citizen/PPI)
Rutland, Lamar	Staff (City Engineer)
Scott, Rev. Joseph	Citizen
Sheffield, Paul	Stakeholder (Emergency Operations Center)
Sims, Hardy (title)	Staff (Police Department, ____ Division)
Sims, Paul	Citizen (Insurance Representative on PPI)
Trussell, James	Citizen
Williams, Melvin	Citizen
Williams, Nick	Staff (Planning/CRS Coordinator/PPI)
Wimberly, Doug	Citizen (Engineer responsible for City's MS-4 Program)
Wingo, Petra	Citizen (Engineer responsible for City's MS-4 Program)



2018



07/18/2018



2018

FLOODPLAIN MANAGEMENT PLAN DRAFT



2018

FLOODPLAIN MANAGEMENT PLAN DRAFT



2018

FLOODPLAIN MANAGEMENT PLAN DRAFT



Minutes: 11-15-2018 Public Hearing Draft Plan

Committee Presented Draft Plan of FMP, Hazard Mitigation Updates and PPI Coverage Plan.

Only changes were correcting 2 committee members titles, which had been inadvertently reversed.

Sign-In Sheets attached.



FLOODPLAIN MANAGEMENT PLANNING COMMITTEE (FMP)

Live Feed Index

1. Meeting 1

<https://www.facebook.com/CityofHattiesburg/videos/1811249642277962/>

2. Meeting 2

<https://www.facebook.com/CityofHattiesburg/videos/1833473330055593/>

3. Meeting 3

<https://www.facebook.com/CityofHattiesburg/videos/1856594291076830/>

4. Meeting 4

<https://www.facebook.com/CityofHattiesburg/videos/752486081749453/>

5. Meeting 5

<https://www.facebook.com/CityofHattiesburg/videos/2168490793363858/>

6. Meeting 6

<https://www.facebook.com/CityofHattiesburg/videos/2160278514226247/>

7. Meeting 7

<https://www.facebook.com/CityofHattiesburg/videos/486992838479096/>

Flooding Questionnaire

City of Hattiesburg

Floodplain Management Plan



Background

The City of Hattiesburg is a voluntary member of the Federal Emergency Management Agency's (FEMA's) Community Rating System (CRS) program. Incentives for participation include flood insurance premium discounts. As part of this program, the COH is developing a regional floodplain management plan with a committee comprised of representatives from the city staff, city's population, and stakeholder groups appointed by the Mayor. **It would greatly assist the planning effort if we had information on flooding issues that you have experienced while residing or working in the City.** This information will only be used for internal planning purposes and will not be distributed. If you have questions, please call the COH Planning at (601) 545- 4599. Please complete the questionnaire on-line at <http://www.hattiesburgms.com/residents/flood-information/> or mail to the COH Planning at Post Office Box 1819 Hattiesburg, Mississippi 39403-1898, or fax to (601) 545-1962 as soon as possible.

Property address: 701 S. 17th Av H'burgs

Contact information: Theresa Ratti 917-667-1507

Name Phone (optional)

Company Name (if applicable)

1. Has your building or property ever been flooded? Yes No
2. When did you move into or occupy the building? 2006
3. In what years (or on what dates) did it flood? Every time there is heavy rain
4. Where did you get water and how deep did it get?
 - In basement (if applicable): _____ feet deep
 - In crawl space (if applicable): _____ feet deep
 - Over first finished floor: _____ feet deep
 - On land only: est 1 feet deep
 - Water kept out of building by sandbagging, sewer valve, other measure.
 - Other _____
5. What do you feel was the cause of your flooding? Check all affecting your building.
 - Storm sewer backup Sanitary sewer backup
 - Standing water next to house Sump pump failure/power failure
 - Saturated ground/leaks in basement walls
 - Overbank flooding from: Creek River Drainage Ditch
 - Other: _____

If Found, Please Return To:
 City of Hattiesburg - Planning Division – Urban Development
 Post Office Box 1898
 Hattiesburg, Mississippi 39403-1898

6. Have you installed any flood protection measures on your property?

- Sump pump
- Overhead sewers, backup valve
- Waterproofed walls
- Regraded property to keep water away from building
- Other: _____
- Backup power system/generator
- Sewer plug or standpipe
- Moved things out of the basement

7. What type of foundation does your building have?

- Slab *Both*
- Crawlspace
- Basement

8. To your knowledge, are creeks and/or drainage ditches in your area kept cleaned out and/or maintained on a regular basis? Yes ___/No ___

If yes, in your opinion does this help with the flood problems?

If no, approximately how often are they are cleaned? *I've never known them to be cleaned - & ditches have filled in over time*

9. Please choose one of the types below that best describes your predominate neighborhood type: Business/office ___ Commercial/Retail ___ Government ___ Industrial ___ Residential Mixed Use ___ (predominately ___) Other (specify) _____

10. Please choose the predominate structure type in your neighborhood:

- Concrete ___ Brick ___ Block ___ Wood Frame Pre-Fab ___
- Wood/Vinyl Siding ___ Mixed ___ (predominately ___)
- Other (specify) _____

11. Do you have flood insurance or a sewer/basement flood rider on your insurance policy? Yes No

12. Do you want information on protecting your building from flooding? Yes No
If yes, please include your name and full mailing address so that we may contact you.

*Theresa Katti
701 S. 17th Ave, Hattiesburg 39401*

Please include any additional comments, photos (place name and address on each so they may be returned), relevant correspondence, or any other documents that you believe may aid our efforts.

If Found, Please Return To:
City of Hattiesburg - Planning Division – Urban Development
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Hattiesburg, Mississippi 39403-1898

Flooding Questionnaire

City of Hattiesburg

Floodplain Management Plan



Background

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Property address:

219 S. 22nd Ave.

Contact information:

Russell N. BEARDEN 601-582-5123

Name

Phone (optional)

Company Name (if applicable)

1. Has your building or property ever been flooded? Yes No
2. When did you move into or occupy the building? 2007
3. In what years (or on what dates) did it flood? _____
4. Where did you get water and how deep did it get?
 - In basement (if applicable): _____ feet deep
 - In crawl space (if applicable): _____ feet deep
 - Over first finished floor: _____ feet deep
 - On land only: _____ feet deep
 - Water kept out of building by sandbagging, sewer valve, other measure.
 - Other _____
5. What do you feel was the cause of your flooding? Check all affecting your building.
 - Storm sewer backup Sanitary sewer backup
 - Standing water next to house Sump pump failure/power failure
 - Saturated ground/leaks in basement walls
 - Overbank flooding from: Creek River Drainage Ditch
 - Other: _____

If Found, Please Return To:

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Flooding Questionnaire

City of Hattiesburg

Floodplain Management Plan



Background

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Property address: 706 Crestview Drive

Contact information: Laura Goodwin-Wright 601-566-0201
Name Phone (optional)

Company Name (if applicable)

- Has your building or property ever been flooded? Yes No
- When did you move into or occupy the building? 2013
- In what years (or on what dates) did it flood? 2013, 14, 15 & 16
- Where did you get water and how deep did it get?
 - In basement (if applicable): _____ feet deep
 - In crawl space (if applicable): _____ feet deep
 - Over first finished floor: _____ feet deep
 - On land only: 2 feet deep
 - Water kept out of building by sandbagging, sewer valve, other measure.
 - Other _____
- What do you feel was the cause of your flooding? Check all affecting your building.
 - Storm sewer backup
 - Sanitary sewer backup
 - Standing water next to house
 - Sump pump failure/power failure
 - Saturated ground/leaks in basement walls
 - Overbank flooding from: Creek River Drainage Ditch
 - Other: _____

No storm flooding inside house

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Hattiesburg, Mississippi 39403-1898

but sanitary sewer collapse in front of house causes repeated flooding in house.

6. Have you installed any flood protection measures on your property?

- Sump pump Backup power system/generator
 Overhead sewers, backup valve Sewer plug or standpipe
 Waterproofed walls Moved things out of the basement
 Regraded property to keep water away from building

Other: replaced all sewage lines to city connection

7. What type of foundation does your building have?

- Slab Crawlspace Basement
raised slab

8. To your knowledge, are creeks and/or drainage ditches in your area kept cleaned out and/or maintained on a regular basis? Yes ___/No - sporadically - not regularly

If yes, in your opinion does this help with the flood problems? yes, when its done
If no, approximately how often are they are cleaned? every 2-3 years

9. Please choose one of the types below that best describes your predominate neighborhood type:

Business/office ___ Commercial/Retail ___ Government ___
Industrial ___ Residential Mixed Use ___ (predominately ___)
Other (specify) _____

10. Please choose the predominate structure type in your neighborhood:

Concrete ___ Brick Block Wood Frame Pre-Fab ___
Wood/Vinyl Siding ___ Mixed (predominately ___)
Other (specify) _____

11. Do you have flood insurance or a sewer/basement flood rider on your insurance policy? Yes No

12. Do you want information on protecting your building from flooding? Yes No
If yes, please include your name and full mailing address so that we may contact you.

Please include any additional comments, photos (place name and address on each so they may be returned), relevant correspondence, or any other documents that you believe may aid our efforts.

If Found, Please Return To:
City of Hattiesburg - Planning Division - Urban Development
Post Office Box 1898
Hattiesburg, Mississippi 39403-1898

Williams, Nick

From: COH Admin <cohactioncenter@gmail.com>
Sent: Monday, July 30, 2018 10:45 AM
To: Williams, Nick
Subject: Fwd: Flooding Questionnaire

----- Forwarded message -----

From: cohactioncenter@gmail.com <cohactioncenter@gmail.com>
Date: Sun, Jul 29, 2018 at 4:08 PM
Subject: Flooding Questionnaire
To: cohactioncenter@gmail.com

The following contact message has been sent:

Name: Lou Ann Schrotter

Phone Number: 601-545-2889

Email: laschrotter@gmail.com

Message: I live at 114 Short Bay Street. The street in front of my house floods (coming up the driveway and into my yard) when we have a heavy rain. The City has done some work to the drain on the street so the water goes down in about 4 hours instead of 4 days. The water will be about 1.5 feet deep at the street and I have to drive my car through it to get into my driveway. My backyard and the adjoining yards flood and the water stands for days after a heavy rain.

Click the tab above that reads "Complete, Save, and Submit". Once application is completed, save and upload it to submit. If you're experiencing difficulty, contact us at 601.545.4599 for further assistance. If you want to save one of the forms after you have filled it out, try "printing" it to a PDF file using the Adobe PDF or similar printer driver. Follow these steps and you should be able to keep electronic copies of all of your submitted forms. After filling in the form, use the File/Print command just like you were going to print it to paper. Click "OK". In the resulting dialog box, pick a place that you will easily remember to save the document. That's all there is to it! You now have a copy of your document with all the fields filled in. :

--

Valerie
Action Center

**THE HOUSING AUTHORITY
OF THE CITY OF HATTIESBURG**

POST OFFICE BOX 832
HATTIESBURG, MISSISSIPPI 39403-0832
(601) 563-1881

Areas of Flash Flooding

Briarfield Homes Apartments—208 Gordon Street

Front of K & L Buildings (Courtyard)
East 2nd Street
Briarfield Street
Ryan Street

Robertson Place Apartment—201 Katie Avenue

Charles Street—A, J, K, Buildings
Cut through street between T & S Buildings
Intersection of John Street & Katie Avenue—D Building & houses

*City of
Richy Jordan
Hibury High
& Columbia - between North & Europa
Columbia @ N main
Drainage Blocked by Street paving*

Flooding Questionnaire

City of Hattiesburg

Floodplain Management Plan

Background

The City of Hattiesburg is a voluntary member of the Federal Emergency Management Agency's (FEMA's) Community Rating System (CRS) program. Incentives for participation include flood insurance premium discounts. As part of this program, the COH is developing a regional floodplain management plan with a committee comprised of representatives from the city staff, city's population, and stakeholder groups appointed by the Mayor. It would greatly assist the planning effort if we had information on flooding issues that you have experienced while residing or working in your area. This information will only be used for internal planning purposes and will not be distributed. If you have questions, please call the COH Planning at (601) 545-4599. Please mail this questionnaire back to the COH Planning at Post Office Box 1819 Hattiesburg, Mississippi 39403-1898, or fax to (601) 545-1962.

Property address: 1208 Coit Street

Contact information: Kate McGehee
Name Phone (optional)

Company Name (if applicable)

1. Has your building or property ever been flooded? Yes No
if "yes," please complete this entire questionnaire.
If "no," please complete questions 6 - 9.

2. In what years (or on what dates) did it flood? 1972 or 1974

3. Where did you get water and how deep did it get?

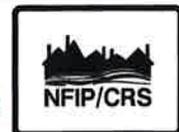
- In basement (if applicable): _____ feet deep
 In crawl space (if applicable): _____ feet deep
 Over first finished floor: 3 feet deep
 On land only: _____ feet deep
 Water kept out of building by sandbagging, sewer valve, other measure.
 Other _____

4. What do you feel was the cause of your flooding? Check all affecting your building.

- Storm sewer backup Sanitary sewer backup
 Standing water next to house Sump pump failure/power failure
 Saturated ground/leaks in basement walls
 Overbank flooding from Ditch & River/Leafy Branch Creek/River
 Other: _____

If Found, Please Return To:

Planning Division – Urban Development
City of Hattiesburg
Post Office Box 1898
Hattiesburg, Mississippi 39403-1898



Flooding Questionnaire

City of Hattiesburg

Floodplain Management Plan

5. Have you installed any flood protection measures on your property'?

- | | |
|---|---|
| <input type="checkbox"/> Sump pump | <input type="checkbox"/> Backup power system/generator |
| <input type="checkbox"/> Overhead sewers, backup valve | <input type="checkbox"/> Sewer plug or standpipe |
| <input type="checkbox"/> Waterproofed walls | <input type="checkbox"/> Moved things out of the basement |
| <input type="checkbox"/> Regraded property to keep water away from building | |
| <input type="checkbox"/> Other: _____ | |

6. When did you move into or occupy the building?

1972

7. What type of foundation does your building have?

- Slab Crawlspace Basement

8. Do you have flood insurance or a sewer/basement flood rider on your insurance policy?

- Yes No

9. Do you want information on protecting your building from flooding?

- Yes No

If yes, please include your name and full mailing address.

Please include any additional comments, photos (place name and address on each so they may be returned), relevant correspondence, or any other documents that you believe may aid our efforts.

Kate McGehee, 1208 Coit St, Hattiesburg, MS 39401

If Found, Please Return To:

Planning Division – Urban Development
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Post Office Box 1898
Hattiesburg, Mississippi 39403-1898



Flooding Questionnaire

City of Hattiesburg

Floodplain Management Plan

Background

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Property address: 900 Coit St

Contact information: Caralyn Brown 601-402-6875
Name Phone (optional)

Company Name (if applicable)

1. Has your building or property ever been flooded? Yes No
 If "yes," please complete this entire questionnaire.
 If "no," please complete questions 6 - 9.

2. In what years (or on what dates) did it flood? 1973 and also thinking 2015 the last flood

3. Where did you get water and how deep did it get? Over flood the house

In basement (if applicable): _____ feet deep
 In crawl space (if applicable): _____ feet deep
 Over first finished floor: _____ feet deep
 On land only: _____ feet deep
 Water kept out of building by sandbagging, sewer valve, other measure.
 Other _____

4. What do you feel was the cause of your flooding? Check all affecting your building.

Storm sewer backup Sanitary sewer backup
 Standing water next to house Sump pump failure/power failure
 Saturated ground/leaks in basement walls
 Overbank flooding from River Creek/River
 Other: _____

If Found, Please Return To:

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 City of Hattiesburg
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 Hattiesburg, Mississippi 39403-1898



Flooding Questionnaire

City of Hattiesburg

Floodplain Management Plan

Background

The City of Hattiesburg is a voluntary member of the Federal Emergency Management Agency's (FEMA's) Community Rating System (CRS) program. Incentives for participation include flood insurance premium discounts. As part of this program, the COH is developing a regional floodplain management plan with a committee comprised of representatives from the city staff, city's population, and stakeholder groups appointed by the Mayor. **It would greatly assist the planning effort if we had information on flooding issues that you have experienced while residing or working in your area.** This information will only be used for internal planning purposes and will not be distributed. If you have questions, please call the COH Planning at (601) 545-4599. Please mail this questionnaire back to the COH Planning at Post Office Box 1819 Hattiesburg, Mississippi 39403-1898, or fax to (601) 545-1962.

Property address: 149 E 10th St

Contact information: MARINE SMITH 601-347-6638
Name Phone (optional)

 Company Name (if applicable)

1. Has your building or property ever been flooded? Yes No
 if "yes," please complete this entire questionnaire.
 If "no," please complete questions 6 - 9.

2. In what years (or on what dates) did it flood? 2015 / 2013

3. Where did you get water and how deep did it get?
 In basement (if applicable): _____ feet deep
 In crawl space (if applicable): _____ feet deep
 Over first finished floor: _____ feet deep
 On land only: 2 feet deep
 Water kept out of building by sandbagging, sewer valve, other measure.
 Other _____

4. What do you feel was the cause of your flooding? Check all affecting your building.
 Storm sewer backup Sanitary sewer backup
 Standing water next to house Sump pump failure/power failure
 Saturated ground/leaks in basement walls
 Overbank flooding from _____ Creek/River
 Other: _____

If Found, Please Return To:

Planning Division – Urban Development
 City of Hattiesburg
 Post Office Box 1898
 Hattiesburg, Mississippi 39403-1898



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Property address:

44 Alex Ln

Contact information:

Chlor Shepard 601 408-1159

Name

Phone (optional)

Company Name (if applicable)

1. Has your building or property ever been flooded? Yes No
2. When did you move into or occupy the building? 2/29/17
3. In what years (or on what dates) did it flood? N/A
4. Where did you get water and how deep did it get?
 - In basement (if applicable): N/A feet deep
 - In crawl space (if applicable): N/A feet deep
 - Over first finished floor: N/A feet deep
 - On land only: N/A feet deep
 - Water kept out of building by sandbagging, sewer valve, other measure.
 - Other N/A
5. What do you feel was the cause of your flooding? Check all affecting your building.
 - Storm sewer backup
 - Sanitary sewer backup
 - Standing water next to house
 - Sump pump failure/power failure
 - Saturated ground/leaks in basement walls
 - Overbank flooding from: Creek River Drainage Ditch
 - Other: _____

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Hattiesburg, Mississippi 39403-1898

6. Have you installed any flood protection measures on your property'?

- Sump pump Backup power system/generator
 Overhead sewers, backup valve Sewer plug or standpipe
 Waterproofed walls Moved things out of the basement
 Regraded property to keep water away from building
 Other: _____

7. What type of foundation does your building have?

- Slab Crawlspace Basement

8. To your knowledge, are creeks and/or drainage ditches in your area kept cleaned out and/or maintained on a regular basis? Yes /No

If yes, in your opinion does this help with the flood problems? _____

If no, approximately how often are they are cleaned? _____

9. Please choose one of the types below that best describes your predominate neighborhood

type: Business/office _____ Commercial/Retail _____ Government _____

Industrial _____ Residential Mixed Use _____ (predominately _____)

Other (specify) _____

10. Please choose the predominate structure type in your neighborhood:

Concrete _____ Brick Block _____ Wood Frame _____ Pre-Fab _____

Wood/Vinyl Siding _____ Mixed _____ (predominately _____)

Other (specify) _____

11. Do you have flood insurance or a sewer/basement flood rider on your insurance policy? Yes No

12. Do you want information on protecting your building from flooding? Yes No
If yes, please include your name and full mailing address so that we may contact you.

Please include any additional comments, photos (place name and address on each so they may be returned), relevant correspondence, or any other documents that you believe may aid our efforts.

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Property address:

107 William St.

Contact information:

Khadijah Muhammad

Name

Phone (optional)

Company Name (if applicable)

1. Has your building or property ever been flooded? Yes No

2. When did you move into or occupy the building?

3/18 Not since Sue

3. In what years (or on what dates) did it flood?

? when in

4. Where did you get water and how deep did it get?

In basement (if applicable): _____ feet deep

In crawl space (if applicable): _____ feet deep

Over first finished floor: _____ feet deep

On land only: _____ feet deep

Water kept out of building by sandbagging, sewer valve, other measure.

Other _____

5. What do you feel was the cause of your flooding? Check all affecting your building.

Storm sewer backup

Sanitary sewer backup

Standing water next to house

Sump pump failure/power failure

Saturated ground/leaks in basement walls

Overbank flooding from:

Creek

River

Drainage Ditch

Other: _____

If Found, Please Return To:

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6. Have you installed any flood protection measures on your property'?

- Sump pump Backup power system/generator
 Overhead sewers, backup valve Sewer plug or standpipe
 Waterproofed walls Moved things out of the basement
 Regraded property to keep water away from building
 Other: _____

7. What type of foundation does your building have?

- Slab Crawlspace Basement

8. To your knowledge, are creeks and/or drainage ditches in your area kept cleaned out and/or maintained on a regular basis? Yes /No

If yes, in your opinion does this help with the flood problems? _____

If no, approximately how often are they are cleaned? _____

9. Please choose one of the types below that best describes your predominate neighborhood

type: Business/office _____ Commercial/Retail _____ Government _____
Industrial _____ Residential Mixed Use _____ (predominately _____)
Other (specify) _____

10. Please choose the predominate structure type in your neighborhood:

Concrete _____ Brick _____ Block _____ Wood Frame Pre-Fab _____
Wood/Vinyl Siding _____ Mixed _____ (predominately _____)
Other (specify) _____

11. Do you have flood insurance or a sewer/basement flood rider on your insurance policy? Yes No

12. Do you want information on protecting your building from flooding? Yes No
If yes, please include your name and full mailing address so that we may contact you.

Please include any additional comments, photos (place name and address on each so they may be returned), relevant correspondence, or any other documents that you believe may aid our efforts.

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Property address:

3304 Luper Drive

Contact information:

Bonita L. Waters

Name

Phone (optional)

Company Name (if applicable)

1. Has your building or property ever been flooded? Yes No
2. When did you move into or occupy the building? 1996
3. In what years (or on what dates) did it flood?
4. Where did you get water and how deep did it get?
 - In basement (if applicable): _____ feet deep
 - In crawl space (if applicable): _____ feet deep
 - Over first finished floor: _____ feet deep
 - On land only: _____ feet deep
 - Water kept out of building by sandbagging, sewer valve, other measure.
 - Other _____
5. What do you feel was the cause of your flooding? Check all affecting your building.
 - Storm sewer backup Sanitary sewer backup
 - Standing water next to house Sump pump failure/power failure
 - Saturated ground/leaks in basement walls
 - Overbank flooding from: Creek River Drainage Ditch
 - Other: _____

If Found, Please Return To:

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Post Office Box 1898
Hattiesburg, Mississippi 39403-1898

6. Have you installed any flood protection measures on your property?

- Sump pump Backup power system/generator
 Overhead sewers, backup valve Sewer plug or standpipe
 Waterproofed walls Moved things out of the basement
 Regraded property to keep water away from building
 Other: _____

7. What type of foundation does your building have?

- Slab Crawlspace Basement

8. To your knowledge, are creeks and/or drainage ditches in your area kept cleaned out and/or maintained on a regular basis? Yes /No

If yes, in your opinion does this help with the flood problems? Yes
If no, approximately how often are they are cleaned? _____

9. Please choose one of the types below that best describes your predominate neighborhood

type: Business/office _____ Commercial/Retail _____ Government _____
Industrial _____ Residential Mixed Use _____ (predominately _____)
Other (specify) _____

10. Please choose the predominate structure type in your neighborhood:

Concrete _____ Brick Block _____ Wood Frame _____ Pre-Fab _____
Wood/Vinyl Siding _____ Mixed _____ (predominately _____)
Other (specify) _____

11. Do you have flood insurance or a sewer/basement flood rider on your insurance policy? Yes No

12. Do you want information on protecting your building from flooding? Yes No
If yes, please include your name and full mailing address so that we may contact you.

Please include any additional comments, photos (place name and address on each so they may be returned), relevant correspondence, or any other documents that you believe may aid our efforts.

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Property address:

105 Barketts Creek DR.

Contact information:

Roderick Allen

601-467-9928

Name

Phone (optional)

Company Name (if applicable)

1. Has your building or property ever been flooded? Yes No
2. When did you move into or occupy the building? 2009
3. In what years (or on what dates) did it flood? NEVER
4. Where did you get water and how deep did it get?
 - In basement (if applicable): _____ feet deep
 - In crawl space (if applicable): _____ feet deep
 - Over first finished floor: 3 feet deep
 - On land only: _____ feet deep
 - Water kept out of building by sandbagging, sewer valve, other measure.
 - Other _____
5. What do you feel was the cause of your flooding? Check all affecting your building.
 - Storm sewer backup
 - Sanitary sewer backup
 - Standing water next to house
 - Sump pump failure/power failure
 - Saturated ground/leaks in basement walls
 - Overbank flooding from: Creek River Drainage Ditch
 - Other: EXCESSIVE amount of rain.

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Property address: 6008 Hwy 49

Contact information: _____
Name Phone (optional)

Company Name (if applicable)

1. Has your building or property ever been flooded? Yes No
2. When did you move into or occupy the building? 2017
3. In what years (or on what dates) did it flood? _____
4. Where did you get water and how deep did it get?
 - In basement (if applicable): _____ feet deep
 - In crawl space (if applicable): _____ feet deep
 - Over first finished floor: _____ feet deep
 - On land only: 2 feet deep
 - Water kept out of building by sandbagging, sewer valve, other measure.
 - Other _____
5. What do you feel was the cause of your flooding? Check all affecting your building.
 - Storm sewer backup
 - Standing water next to house
 - Saturated ground/leaks in basement walls
 - Overbank flooding from: Creek River Drainage Ditch
 - Other _____
 - Sanitary sewer backup
 - Sump pump failure/power failure

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6. Have you installed any flood protection measures on your property?
- | | |
|---|---|
| <input type="checkbox"/> Sump pump | <input type="checkbox"/> Backup power system/generator |
| <input type="checkbox"/> Overhead sewers, backup valve | <input type="checkbox"/> Sewer plug or standpipe |
| <input type="checkbox"/> Waterproofed walls | <input type="checkbox"/> Moved things out of the basement |
| <input type="checkbox"/> Regraded property to keep water away from building | |
| <input type="checkbox"/> Other: _____ | |

7. What type of foundation does your building have?
- Slab Crawlspace Basement

8. To your knowledge, are creeks and/or drainage ditches in your area kept cleaned out and/or maintained on a regular basis? Yes / No
 If yes, in your opinion does this help with the flood problems? Yes
 If no, approximately how often are they are cleaned? _____

9. Please choose one of the types below that best describes your predominate neighborhood type: Business/office _____ Commercial/Retail _____ Government _____
 Industrial _____ Residential _____ Mixed Use (predominately _____)
 Other (specify) _____

10. Please choose the predominate structure type in your neighborhood:
 Concrete _____ Brick Block _____ Wood Frame _____ Pre-Fab _____
 Wood/Vinyl Siding _____ Mixed _____ (predominately _____)
 Other (specify) _____

11. Do you have flood insurance or a sewer/basement flood rider on your insurance policy? Yes No

12. Do you want information on protecting your building from flooding? Yes No
 If yes, please include your name and full mailing address so that we may contact you.

Please include any additional comments, photos (place name and address on each so they may be returned), relevant correspondence, or any other documents that you believe may aid our efforts.

A rental - have moved

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Property address: 422 S 15th AVENUE

Contact information: Jill Kochom _____
Name Phone (optional)

_____ Company Name (if applicable)

1. Has your building or property ever been flooded? Yes No
2. When did you move into or occupy the building? 1/17
3. In what years (or on what dates) did it flood? n/a
4. Where did you get water and how deep did it get?
 - In basement (if applicable): _____ feet deep
 - In crawl space (if applicable): _____ feet deep
 - Over first finished floor: _____ feet deep
 - On land only: _____ feet deep
 - Water kept out of building by sandbagging, sewer valve, other measure.
 - Other _____
5. What do you feel was the cause of your flooding? Check all affecting your building.
 - Storm sewer backup Sanitary sewer backup
 - Standing water next to house Sump pump failure/power failure
 - Saturated ground/leaks in basement walls
 - Overbank flooding from: Creek River Drainage Ditch
 - Other: _____

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6. Have you installed any flood protection measures on your property?

- Sump pump Backup power system/generator
 Overhead sewers, backup valve Sewer plug or standpipe
 Waterproofed walls Moved things out of the basement
 Regraded property to keep water away from building
 Other: _____

7. What type of foundation does your building have?

- Slab Crawlspace Basement

8. To your knowledge, are creeks and/or drainage ditches in your area kept cleaned out and/or maintained on a regular basis? Yes ___/No X

If yes, in your opinion does this help with the flood problems?

If no, approximately how often are they are cleaned? 2x in 1 1/2 yrs I HAVE LIVED in my House

9. Please choose one of the types below that best describes your predominate neighborhood type: Business/office ___ Commercial/Retail ___ Government ___ Industrial ___ Residential X Mixed Use ___ (predominately ___)
Other (specify) _____

10. Please choose the predominate structure type in your neighborhood:

Concrete ___ Brick X Block ___ Wood Frame X Pre-Fab ___
Wood/Vinyl Siding ___ Mixed ___ (predominately ___)
Other (specify) _____

11. Do you have flood insurance or a sewer/basement flood rider on your insurance policy? Yes No

12. Do you want information on protecting your building from flooding? Yes No
If yes, please include your name and full mailing address so that we may contact you.

Please include any additional comments, photos (place name and address on each so they may be returned), relevant correspondence, or any other documents that you believe may aid our efforts.

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Property address:

101 Griffith Road, HB, MS 39402

Contact information:

Pamela Cameron

601-549-4933

Name

Phone (optional)

Company Name (if applicable)

1. Has your building or property ever been flooded? Yes No
2. When did you move into or occupy the building? 2004
3. In what years (or on what dates) did it flood? every time it rain for last 5-6 years
4. Where did you get water and how deep did it get?
 - In basement (if applicable): _____ feet deep
 - In crawl space (if applicable): _____ feet deep
 - Over first finished floor: _____ feet deep
 - On land only: _____ feet deep
 - Water kept out of building by sandbagging, sewer valve, other measure.
 - Other both bathrooms toilets over flow
5. What do you feel was the cause of your flooding? Check all affecting your building.
 - Storm sewer backup
 - Sanitary sewer backup
 - Standing water next to house
 - Sump pump failure/power failure
 - Saturated ground/leaks in basement walls
 - Overbank flooding from: Creek River Drainage Ditch
 - Other: _____

If Found, Please Return To:

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6. Have you installed any flood protection measures on your property'?

- Sump pump Backup power system/generator
 Overhead sewers, backup valve Sewer plug or standpipe
 Waterproofed walls Moved things out of the basement
 Regraded property to keep water away from building
 Other: NO - Can't afford.

7. What type of foundation does your building have?

- Slab Crawlspace Basement

8. To your knowledge, are creeks and/or drainage ditches in your area kept cleaned out and/or maintained on a regular basis? Yes /No

If yes, in your opinion does this help with the flood problems? NO
If no, approximately how often are they are cleaned? _____

9. Please choose one of the types below that best describes your predominate neighborhood type: Business/office _____ Commercial/Retail _____ Government _____ Industrial _____ Residential Mixed Use _____ (predominately _____)
Other (specify) _____

10. Please choose the predominate structure type in your neighborhood:

Concrete _____ Brick Block _____ Wood Frame _____ Pre-Fab _____
Wood/Vinyl Siding Mixed _____ (predominately _____)
Other (specify) _____

11. Do you have flood insurance or a sewer/basement flood rider on your insurance policy? Yes No

12. Do you want information on protecting your building from flooding? Yes No
If yes, please include your name and full mailing address so that we may contact you.

Please include any additional comments, photos (place name and address on each so they may be returned), relevant correspondence, or any other documents that you believe may aid our efforts.

I believe my problem is with the pipes going into the sewer. Every time it rains, toilets overflow, sinks & tubs get drainage

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Property address: 200 Concan St., Hattiesburg MS 39401

Contact information: Wes Curry 601-543-2974
 Name Phone (optional)

 Company Name (if applicable)

1. Has your building or property ever been flooded? Yes No
2. When did you move into or occupy the building? 2004
3. In what years (or on what dates) did it flood? it didn't to my knowledge
4. Where did you get water and how deep did it get?
 - In basement (if applicable): _____ feet deep
 - In crawl space (if applicable): _____ feet deep
 - Over first finished floor: _____ feet deep
 - On land only: _____ feet deep
 - Water kept out of building by sandbagging, sewer valve, other measure.
 - Other N/A
5. What do you feel was the cause of your flooding? Check all affecting your building.
 - Storm sewer backup Sanitary sewer backup
 - Standing water next to house Sump pump failure/power failure
 - Saturated ground/leaks in basement walls
 - Overbank flooding from: Creek River Drainage Ditch
 - Other: N/A

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 Post Office Box 1898
 Hattiesburg, Mississippi 39403-1898

Williams, Nick

From: Lisa Reid <JOHNNYREID807@comcast.net>
Sent: Tuesday, June 19, 2018 9:43 PM
To: MaryDryden
Cc: Hill, Colton; Howe, Alan; Lowrey, Ginger; Ellard, Andrew; Williams, Nick
Subject: RE: Flood Prevention

Councilwoman Dryden,

Thank you for the reminder. I did have some of this information, and I have obtained/reviewed a copy of the Shows, Dearman and Waits report.

This is my personnel E-Mail so feel free to contact me directly or Andrew, Ginger or Nick if other locations come about. We will start the reviews in the next few weeks and will make sure all of these locations are included.

Thank you,
Lisa Reid

-----Original Message-----

From: Ellard, Andrew <aellard@hattiesburgms.com>
Sent: Tuesday, June 19, 2018 9:47 AM
To: Lisa Reid <JOHNNYREID807@comcast.net>; Lowrey, Ginger <glowrey@hattiesburgms.com>
Cc: Hill, Colton <chill@hattiesburgms.com>; Howe, Alan <ahowe@hattiesburgms.com>
Subject: FW: Flood Prevention

Lisa and Ginger,
Please see the reminder from Mrs. Dryden below as requested.

Colton and Alan,

I'm sure you are both aware of several of these, but I told Mrs. Dryden that I would forward to you as well. I see that Lamar was already cc'd.

Thanks,
Andrew Ellard

-----Original Message-----

From: Mary Dryden [mailto:marycdryden@yahoo.com]
Sent: Tuesday, June 19, 2018 6:00 AM
To: Ellard, Andrew <aellard@hattiesburgms.com>
Cc: Jones, Ann <annjones@hattiesburgms.com>; Mayor <mayor@hattiesburgms.com>; Rutland, Lamar <lrutland@hattiesburgms.com>
Subject: Flood Prevention

Dear Mr. Ellard,

When Lisa Reid updated the Council recently on the progress toward improving our rating with flood insurance and plans for flood prevention, she requested an email with a reminder about the issues raised by each council person.

This is a reminder that the work on Gordon's Creek to prevent erosion and flooding needs to be addressed in the section that runs parallel with both Lincoln Road and Sunset Drive between S. 28th Avenue and Broadway Drive.

This is also a reminder that future flood prevention should include Corinne Street between Broadway Drive and Hardy Street, particularly the intersection of 5th Avenue and Corinne Street as well as the drainage ditches that run parallel with W. Pine Street and Corinne Street. It is a reminder of the Flood Study completed by Shows, Dearman, and Waits.

It is my hope that flooding on Hardy Street is being addressed, as the outside lane on the South side has frequently been impassable between S.

17th Avenue and Mamie Street during the past two years when heavy rainfall occurs.

There is also a chronic drainage problem at the intersection of S. 13th Avenue and Concart Street that has been addressed several times and is still not resolved and makes that area difficult to drive during a heavy rain.

Thank you for continuing to make progress toward the flooding issues.

Sincerely,

Councilwoman Mary Dryden

Ward Four

Williams, Nick

From: Parker, Andy
Sent: Wednesday, July 18, 2018 11:14 AM
To: Williams, Nick
Subject: Creek/flood pics
Attachments: IMG_1636.JPG; IMG_1637.JPG; IMG_1639.JPG; IMG_1640.JPG

Nick,

Here are some pictures of debris/flood pinch points.

I will send a few pics in three emails. Easier to download.

Let me know if this is something that you are trying to address or useful info.

If you need anything else or something specific, let me know.

See you tomorrow.

Andy

Williams, Nick

From: COH Admin <cohactioncenter@gmail.com>
Sent: Wednesday, July 18, 2018 11:28 AM
To: Williams, Nick
Subject: Fwd: Flooding Questionnaire

----- Forwarded message -----

From: cohactioncenter@gmail.com <cohactioncenter@gmail.com>
Date: Wed, Jul 18, 2018 at 11:21 AM
Subject: Flooding Questionnaire
To: cohactioncenter@gmail.com

The following contact message has been sent:

Name: Siobhan O'Quinn Crawford

Phone Number: 6013250270

Email: siobhanoq@yahoo.com

Message: The dead end alley between 12th&13th is very prone to knee deep flooding

Click the tab above that reads "Complete, Save, and Submit". Once application is completed, save and upload it to submit. If you're experiencing difficulty, contact us at 601.545.4599 for further assistance. If you want to save one of the forms after you have filled it out, try "printing" it to a PDF file using the Adobe PDF or similar printer driver. Follow these steps and you should be able to keep electronic copies of all of your submitted forms. After filling in the form, use the File/Print command just like you were going to print it to paper. Click "OK". In the resulting dialog box, pick a place that you will easily remember to save the document. That's all there is to it! You now have a copy of your document with all the fields filled in. :

--
Valerie
Action Center

Williams, Nick

From: COH Admin <cohactioncenter@gmail.com>
Sent: Wednesday, July 18, 2018 12:30 PM
To: Williams, Nick
Subject: Fwd: Flooding Questionnaire

----- Forwarded message -----

From: cohactioncenter@gmail.com <cohactioncenter@gmail.com>
Date: Wed, Jul 18, 2018 at 11:58 AM
Subject: Flooding Questionnaire
To: cohactioncenter@gmail.com

The following contact message has been sent:

Name: Gabby Bulger

Phone Number: 6012607815

Email: Sai.horn.girl@gmail.com

Message: I havent had flood damage to my property but I have worked as a delivery driver in Hattiesburg for two years. The places that made me worry the most were areas around kamper park/Gordon's creek, hardy street (storm drains overflowing) and a bad spot at west Arlington and south 29th.

Click the tab above that reads "Complete, Save, and Submit". Once application is completed, save and upload it to submit. If you're experiencing difficulty, contact us at 601.545.4599 for further assistance. If you want to save one of the forms after you have filled it out, try "printing" it to a PDF file using the Adobe PDF or similar printer driver. Follow these steps and you should be able to keep electronic copies of all of your submitted forms. After filling in the form, use the File/Print command just like you were going to print it to paper. Click "OK". In the resulting dialog box, pick a place that you will easily remember to save the document. That's all there is to it! You now have a copy of your document with all the fields filled in. :

--
Valerie
Action Center

Williams, Nick

From: COH Admin <cohactioncenter@gmail.com>
Sent: Wednesday, July 18, 2018 1:27 PM
To: Williams, Nick
Subject: Fwd: Flooding Questionnaire
Attachments: F9DB7724-8500-445E-B77D-C7AEFF6F3DDF.jpeg

----- Forwarded message -----

From: cohactioncenter@gmail.com <cohactioncenter@gmail.com>
Date: Wed, Jul 18, 2018 at 12:57 PM
Subject: Flooding Questionnaire
To: cohactioncenter@gmail.com

The following contact message has been sent:

Name: Sarah McFadden

Phone Number: 6622073201

Email: sarah.mcfadd3n@gmail.com

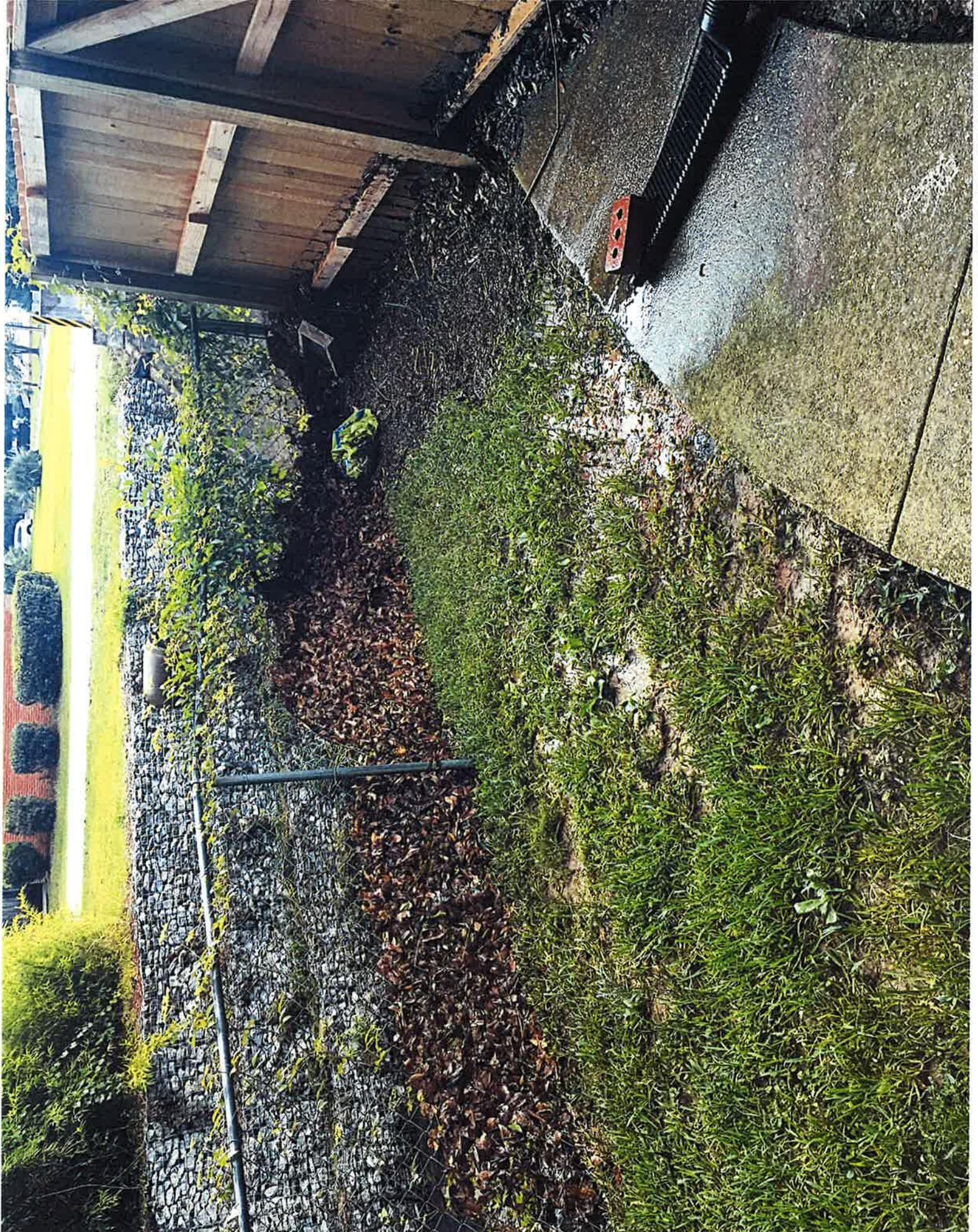
Message: I don't know if my scenario is what you guy's are looking for but here it goes...

I purchased my home at 501 S 21st Ave in November 2017. My backyard backs up to Gordon's Creek. I was told during the buying process that the laundry room flooded during Hurricane Katrina. On July 6, 2018 late evening, we had a lot of rain fall in a very short amount of time. This rain caused a couple feet of water to come through the chain link fence along the creek and ended up being a several inches high from the base of the house. I could only attach one photo, but that one shows the debris water line along the chain link fence and along the wood fence. So far, this is the only "flooding" I have encountered since moving in in November 2017. I hope this can help an any way to improve our flooding issues.

Click the tab above that reads "Complete, Save, and Submit". Once application is completed, save and upload it to submit. If you're experiencing difficulty, contact us at 601.545.4599 for further assistance. If you want to save one of the forms after you have filled it out, try "printing" it to a PDF file using the Adobe PDF or similar printer driver. Follow these steps and you should be able to keep electronic copies of all of your submitted forms. After filling in the form, use the File/Print command just like you were going to print it to paper. Click "OK". In the resulting dialog box, pick a place that you will easily remember to save the document. That's all there is to it! You now have a copy of your document with all the fields filled in. : F9DB7724-8500-445E-B77D-C7AEFF6F3DDF.jpeg

--

Valerie
Action Center



Williams, Nick

From: Melvin Williams <torsklucky@aol.com>
Sent: Wednesday, July 18, 2018 3:19 PM
To: Williams, Nick
Subject: Flash flooding
Attachments: IMG_1609.JPG; ATT00001.txt; IMG_1608.JPG; ATT00002.txt; IMG_1607.JPG; ATT00003.txt; IMG_1606.JPG; ATT00004.txt; IMG_1605.JPG; ATT00005.txt; IMG_1604.JPG; ATT00006.txt

Hey Nick I took these pictures today. I'm sending more from the community

Williams, Nick

From: Melvin Williams <torsklucky@aol.com>
Sent: Wednesday, July 18, 2018 6:39 PM
To: Williams, Nick
Subject: HWY 42
Attachments: IMG_1650.JPG; ATT00001.txt; IMG_1652.JPG; ATT00002.txt; IMG_1653.JPG; ATT00003.txt; IMG_1654.JPG; ATT00004.txt; IMG_1656.JPG; ATT00005.txt; IMG_1658.JPG; ATT00006.txt; IMG_1642.JPG; ATT00007.txt; IMG_1643.JPG; ATT00008.txt

Severe flooding 2016 or 2017 Jones School, Atlanta St, Mobile St.

Williams, Nick

From: COH Admin <cohactioncenter@gmail.com>
Sent: Thursday, July 19, 2018 9:04 AM
To: Williams, Nick
Subject: Fwd: Flooding Questionnaire

----- Forwarded message -----

From: cohactioncenter@gmail.com <cohactioncenter@gmail.com>
Date: Thu, Jul 19, 2018 at 12:46 AM
Subject: Flooding Questionnaire
To: cohactioncenter@gmail.com

The following contact message has been sent:

Name: Karen Jacobs

Phone Number: 2024692448

Email: jkhn123@comcast.net

Message: I have owned my home for 25 years and have trouble with a huge amount of water running through my yard from the alley and North 21st Ave. It floods my garage, my lower level room and has caused my sewer line to cave in. There are no storm drains any where in my vicinity, so it has no where to go but in my yard and home causing damage. I have complained about it numerous times, with no solution. Please help it is causing the walls in my garage to rot!!!

Click the tab above that reads "Complete, Save, and Submit". Once application is completed, save and upload it to submit. If you're experiencing difficulty, contact us at 601.545.4599 for further assistance. If you want to save one of the forms after you have filled it out, try "printing" it to a PDF file using the Adobe PDF or similar printer driver. Follow these steps and you should be able to keep electronic copies of all of your submitted forms. After filling in the form, use the File/Print command just like you were going to print it to paper. Click "OK". In the resulting dialog box, pick a place that you will easily remember to save the document. That's all there is to it! You now have a copy of your document with all the fields filled in. :

--
Valerie
Action Center

Williams, Nick

From: COH Admin <cohactioncenter@gmail.com>
Sent: Thursday, July 19, 2018 10:42 AM
To: Williams, Nick
Subject: Fwd: Flooding Questionnaire

----- Forwarded message -----

From: cohactioncenter@gmail.com <cohactioncenter@gmail.com>
Date: Thu, Jul 19, 2018 at 10:27 AM
Subject: Flooding Questionnaire
To: cohactioncenter@gmail.com

The following contact message has been sent:

Name: sarah Halliwell

Phone Number: 6015962832

Email: sdhalliwell@yahoo.com

Message: I own Twin Forks Wine + Provisions at 408 Hemphill St. We high up on a hill with no chances of flooding, how can I get my flood zone changed?

Click the tab above that reads "Complete, Save, and Submit". Once application is completed, save and upload it to submit. If you're experiencing difficulty, contact us at 601.545.4599 for further assistance. If you want to save one of the forms after you have filled it out, try "printing" it to a PDF file using the Adobe PDF or similar printer driver. Follow these steps and you should be able to keep electronic copies of all of your submitted forms. After filling in the form, use the File/Print command just like you were going to print it to paper. Click "OK". In the resulting dialog box, pick a place that you will easily remember to save the document. That's all there is to it! You now have a copy of your document with all the fields filled in. :

--
Valerie
Action Center

OK Tom

Neighborhood Associations as well. This form is also accessible on our website (go to: <http://www.hattiesburgms.com/residents/flood-information/>), where citizens can submit them electronically. It's important that we collect as much data as possible to see if there are any changes to maps. If you have any questions, please feel free to contact me. Thanks

Nicholas Williams
Planner, Planning
<ATT73141 1.jpg>
P. O. Box 1898, Hattiesburg, MS 39403

[601.554.1019](tel:601.554.1019)

nwilliams@hattiesburgms.com

<FMP_Questionnaire.pdf>

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Flooding Questionnaire

City of Hattiesburg

Floodplain Management Plan



Background

The City of Hattiesburg is a voluntary member of the Federal Emergency Management Agency's (FEMA's) Community Rating System (CRS) program. Incentives for participation include flood insurance premium discounts. As part of this program, the COH is developing a regional floodplain management plan with a committee comprised of representatives from the city staff, city's population, and stakeholder groups appointed by the Mayor. It would greatly assist the planning effort if we had information on flooding issues that you have experienced while residing or working in the City. This information will only be used for internal planning purposes and will not be distributed. If you have questions, please call the COH Planning at (601) 545-4599. Please complete the questionnaire on-line at <http://www.hattiesburgms.com/residents/flood-information/> or mail to the COH Planning at Post Office Box 1819 Hattiesburg, Mississippi 39403-1898, or fax to (601) 545-1962 as soon as possible.

Property address: 104 Camellia Circle, Hattiesburg, MS

Contact information: David Goodwin 601-606-1204

Name Phone (optional)

Company Name (if applicable)

1. Has your building or property ever been flooded? Yes No
2. When did you move into or occupy the building? August, 1988
3. In what years (or on what dates) did it flood? Never
4. Where did you get water and how deep did it get?
 - In basement (if applicable): _____ feet deep
 - In crawl space (if applicable): _____ feet deep
 - Over first finished floor: _____ feet deep
 - On land only: _____ feet deep
 - Water kept out of building by sandbagging, sewer valve, other measure.
 - Other Never flooded
5. What do you feel was the cause of your flooding? Check all affecting your building.
 - Storm sewer backup Sanitary sewer backup
 - Standing water next to house Sump pump failure/power failure
 - Saturated ground/leaks in basement walls
 - Overbank flooding from: Creek River Drainage Ditch
 - Other: N/A

If Found, Please Return To:
City of Hattiesburg - Planning Division – Urban Development
Post Office Box 1898
Hattiesburg, Mississippi 39403-1898

6. Have you installed any flood protection measures on your property'?

- Sump pump Backup power system/generator
 Overhead sewers, backup valve Sewer plug or standpipe
 Waterproofed walls Moved things out of the basement
 Regraded property to keep water away from building
 Other: _____

7. What type of foundation does your building have?

- Slab Crawlspace Basement

8. To your knowledge, are creeks and/or drainage ditches in your area kept cleaned out and/or maintained on a regular basis? Yes /No

If yes, in your opinion does this help with the flood problems? Yes _____

If no, approximately how often are they are cleaned? _____

9. Please choose one of the types below that best describes your predominate neighborhood

type: Business/office _____ Commercial/Retail _____ Government _____
Industrial _____ Residential Mixed Use _____ (predominately _____)
Other (specify) _____

10. Please choose the predominate structure type in your neighborhood:

Concrete _____ Brick _____ Block _____ Wood Frame _____ Pre-Fab _____
Wood/Vinyl Siding _____ Mixed (predominately ^{brick} _____)
Other (specify) _____

11. Do you have flood insurance or a sewer/basement flood rider on your insurance policy? Yes No

12. Do you want information on protecting your building from flooding? Yes No
If yes, please include your name and full mailing address so that we may contact you.

Please include any additional comments, photos (place name and address on each so they may be returned), relevant correspondence, or any other documents that you believe may aid our efforts.

If Found, Please Return To:

City of Hattiesburg - Planning Division – Urban Development
Post Office Box 1898
Hattiesburg, Mississippi 39403-1898

Flooding Questionnaire

City of Hattiesburg

Floodplain Management Plan



Background

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Contact information: Peggy Horton Name 601-264-1887 Phone \(optional\)

Company Name \(if applicable\) _____](http://www.hattiesburgms.com/residents/flood-information/or mail to the COH Planning at Post Office Box 1819 Hattiesburg, Mississippi 39403-1898, or fax to (601) 545-1962 as soon as possible.</p>
</div>
<div data-bbox=)

1. Has your building or property ever been flooded? Yes No
2. When did you move into or occupy the building? 1985
3. In what years (or on what dates) did it flood? Never
4. Where did you get water and how deep did it get?
 - In basement (if applicable): _____ feet deep
 - In crawl space (if applicable): _____ feet deep
 - Over first finished floor: _____ feet deep
 - On land only: _____ feet deep
 - Water kept out of building by sandbagging, sewer valve, other measure.
 - Other _____
5. What do you feel was the cause of your flooding? Check all affecting your building.
 - Storm sewer backup
 - Standing water next to house
 - Saturated ground/leaks in basement walls
 - Overbank flooding from: Creek River Drainage Ditch
 - Other: _____
 - Sanitary sewer backup
 - Sump pump failure/power failure

If Found, Please Return To:
 City of Hattiesburg - Planning Division - Urban Development
 Post Office Box 1898
 Hattiesburg, Mississippi 39403-1898

Flooding Questionnaire

City of Hattiesburg

Floodplain Management Plan



Background

The City of Hattiesburg is a voluntary member of the Federal Emergency Management Agency's (FEMA's) Community Rating System (CRS) program. Incentives for participation include flood insurance premium discounts. As part of this program, the COH is developing a regional floodplain management plan with a committee comprised of representatives from the city staff, city's population, and stakeholder groups appointed by the Mayor. It would greatly assist the planning effort if we had information on flooding issues that you have experienced while residing or working in the City. This information will only be used for internal planning purposes and will not be distributed. If you have questions, please call the COH Planning at (601) 545- 4599. Please complete the questionnaire on-line at <http://www.hattiesburgms.com/residents/flood-information/> or mail to the COH Planning at Post Office Box 1819 Hattiesburg, Mississippi 39403-1898, or fax to (601) 545-1962 as soon as possible.

Property address: 208 Gardan Street

Contact information: Margaret Heath 601-583-1881

<u>Name</u>	<u>Phone (optional)</u>
<u>The Housing Authority of the City of Hattiesburg</u>	
<u>Company Name (if applicable)</u>	

1. Has your building or property ever been flooded? Yes No
2. When did you move into or occupy the building? 1942
3. In what years (or on what dates) did it flood? 1974
4. Where did you get water and how deep did it get?
 - In basement (if applicable): _____ feet deep
 - In crawl space (if applicable): _____ feet deep
 - Over first finished floor: 5 Feet feet deep
 - On land only: _____ feet deep
 - Water kept out of building by sandbagging, sewer valve, other measure.
 - Other _____
5. What do you feel was the cause of your flooding? Check all affecting your building.
 - Storm sewer backup
 - Standing water next to house
 - Saturated ground/leaks in basement walls
 - Overbank flooding from: Creek River Drainage Ditch
 - Other: _____
 - Sanitary sewer backup
 - Sump pump failure/power failure

If Found, Please Return To:
 City of Hattiesburg - Planning Division - Urban Development
 Post Office Box 1898
 Hattiesburg, Mississippi 39403-1898

6. Have you installed any flood protection measures on your property?

- | | |
|--|---|
| <input type="checkbox"/> Sump pump | <input type="checkbox"/> Backup power system/generator |
| <input type="checkbox"/> Overhead sewers, backup valve | <input type="checkbox"/> Sewer plug or standpipe |
| <input type="checkbox"/> Waterproofed walls | <input type="checkbox"/> Moved things out of the basement |
| <input type="checkbox"/> Regraded property to keep water away from building | |
| <input checked="" type="checkbox"/> Other: <u>Rebuilt and elevated two buildings</u> | |

7. What type of foundation does your building have?

- Slab Crawlspace Basement

8. To your knowledge, are creeks and/or drainage ditches in your area kept cleaned out and/or maintained on a regular basis? Yes ___/No

If yes, in your opinion does this help with the flood problems? _____

If no, approximately how often are they are cleaned? _____

9. Please choose one of the types below that best describes your predominate neighborhood

type: Business/office Commercial/Retail ___ Government ___
Industrial ___ Residential Mixed Use ___ (predominately _____)
Other (specify) _____

10. Please choose the predominate structure type in your neighborhood:

Concrete ___ Brick Block Wood Frame ___ Pre-Fab ___
Wood/Vinyl Siding ___ Mixed ___ (predominately _____)
Other (specify) _____

11. Do you have flood insurance or a sewer/basement flood rider on your insurance policy? Yes No

12. Do you want information on protecting your building from flooding? Yes No
If yes, please include your name and full mailing address so that we may contact you.

Please include any additional comments, photos (place name and address on each so they may be returned), relevant correspondence, or any other documents that you believe may aid our efforts.

If Found, Please Return To:
City of Hattiesburg - Planning Division - Urban Development
Post Office Box 1898
Hattiesburg, Mississippi 39403-1898

3

Flooding Questionnaire

City of Hattiesburg

Floodplain Management Plan



Background

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Property address:

2907 Glenn Dr

Contact information:

Joyce Raby

601-264-3925

Name

Phone (optional)

Company Name (if applicable)

- Has your building or property ever been flooded? Yes No
- When did you move into or occupy the building? 1979
- In what years (or on what dates) did it flood? NA
- Where did you get water and how deep did it get?
 - In basement (if applicable): _____ feet deep
 - In crawl space (if applicable): _____ feet deep
 - Over first finished floor: _____ feet deep
 - On land only: _____ feet deep
 - Water kept out of building by sandbagging, sewer valve, other measure.
 - Other _____
- What do you feel was the cause of your flooding? Check all affecting your building.
 - Storm sewer backup
 - Sanitary sewer backup
 - Standing water next to house
 - Sump pump failure/power failure
 - Saturated ground/leaks in basement walls
 - Overbank flooding from: Creek River Drainage Ditch
 - Other: _____

If Found, Please Return To:

City of Hattiesburg - Planning Division - Urban Development
Post Office Box 1898
Hattiesburg, Mississippi 39403-1898

6. Have you installed any flood protection measures on your property'?

- Sump pump Backup power system/generator
 Overhead sewers, backup valve Sewer plug or standpipe
 Waterproofed walls Moved things out of the basement
 Regraded property to keep water away from building
 Other: _____

7. What type of foundation does your building have?

- Slab Crawlspace Basement

8. To your knowledge, are creeks and/or drainage ditches in your area kept cleaned out and/or maintained on a regular basis? Yes ___/No ___ *I don't know*

If yes, in your opinion does this help with the flood problems? _____

If no, approximately how often are they are cleaned? _____

9. Please choose one of the types below that best describes your predominate neighborhood

type: Business/office _____ Commercial/Retail _____ Government _____

Industrial _____ Residential _____ Mixed Use _____ (predominately _____)

Other (specify) _____

10. Please choose the predominate structure type in your neighborhood:

Concrete _____ Brick _____ Block _____ Wood Frame _____ Pre-Fab _____

Wood/Vinyl Siding _____ Mixed *✓* (predominately _____)

Other (specify) _____

11. Do you have flood insurance or a sewer/basement flood rider on your insurance policy? Yes No

12. Do you want information on protecting your building from flooding? Yes No

If yes, please include your name and full mailing address so that we may contact you.

Please include any additional comments, photos (place name and address on each so they may be returned), relevant correspondence, or any other documents that you believe may aid our efforts.

If Found, Please Return To:

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Post Office Box 1898

Hattiesburg, Mississippi 39403-1898

Flooding Questionnaire

City of Hattiesburg

Floodplain Management Plan



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Property address:

22 TROON CIR.

Contact information:

ERIC & MAGGIE MARTIN

Name

Phone (optional)

Company Name (if applicable)

1. Has your building or property ever been flooded? Yes No
2. When did you move into or occupy the building? 2000
3. In what years (or on what dates) did it flood? NEVER
4. Where did you get water and how deep did it get?
 - In basement (if applicable): _____ feet deep
 - In crawl space (if applicable): _____ feet deep
 - Over first finished floor: _____ feet deep
 - On land only: _____ feet deep
 - Water kept out of building by sandbagging, sewer valve, other measure.
 - Other _____
5. What do you feel was the cause of your flooding? Check all affecting your building.
 - Storm sewer backup
 - Sanitary sewer backup
 - Standing water next to house
 - Sump pump failure/power failure
 - Saturated ground/leaks in basement walls
 - Overbank flooding from: Creek River Drainage Ditch
 - Other: _____

If Found, Please Return To:

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Post Office Box 1898
Hattiesburg, Mississippi 39403-1898

Flooding Questionnaire

City of Hattiesburg

Floodplain Management Plan



Background

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Property address:

207 S. 24th Avenue

Contact information:

Chase Cunningham

Name

225-721-2881

Phone (optional)

Company Name (if applicable)

1. Has your building or property ever been flooded? Yes No
2. When did you move into or occupy the building? Spring 2013
3. In what years (or on what dates) did it flood? —
4. Where did you get water and how deep did it get?
 - In basement (if applicable): _____ feet deep
 - In crawl space (if applicable): _____ feet deep
 - Over first finished floor: _____ feet deep
 - On land only: _____ feet deep
 - Water kept out of building by sandbagging, sewer valve, other measure.
 - Other _____
5. What do you feel was the cause of your flooding? Check all affecting your building.
 - Storm sewer backup
 - Sanitary sewer backup
 - Standing water next to house
 - Sump pump failure/power failure
 - Saturated ground/leaks in basement walls
 - Overbank flooding from: Creek River Drainage Ditch
 - Other: _____

If Found, Please Return To:

City of Hattiesburg - Planning Division - Urban Development
Post Office Box 1898
Hattiesburg, Mississippi 39403-1898

6. Have you installed any flood protection measures on your property?

- Sump pump Backup power system/generator
 Overhead sewers, backup valve Sewer plug or standpipe
 Waterproofed walls Moved things out of the basement
 Regraded property to keep water away from building
 Other: French drainage system built when house was 1949.
(Concrete road)

7. What type of foundation does your building have?

- Slab Crawlspace Basement

8. To your knowledge, are creeks and/or drainage ditches in your area kept cleaned out and/or maintained on a regular basis? Yes ___/No

If yes, in your opinion does this help with the flood problems? _____

If no, approximately how often are they are cleaned? Never

9. Please choose one of the types below that best describes your predominate neighborhood

type: Business/office ___ Commercial/Retail ___ Government ___
Industrial ___ Residential Mixed Use ___ (predominately ___)
Other (specify) Historic Parkhaven

10. Please choose the predominate structure type in your neighborhood:

Concrete ___ Brick ___ Block ___ Wood Frame ___ Pre-Fab ___
Wood/Vinyl Siding ___ Mixed ___ (predominately ___)
Other (specify) _____

11. Do you have flood insurance or a sewer/basement flood rider on your insurance policy? Yes No

12. Do you want information on protecting your building from flooding? Yes No
If yes, please include your name and full mailing address so that we may contact you.

Please include any additional comments, photos (place name and address on each so they may be returned), relevant correspondence, or any other documents that you believe may aid our efforts.

The City needs to do a better job of clearing ditches along neighborhood streets, and when it is clogged with mud & rock sediment, it would be most helpful to use more than a shovel. With heavy downpours, it becomes dangerous for traffic when water overflows into streets. There is potential for cars to hydroplane. Do not get as bad as the City of

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Hattiesburg, Mississippi 39403-1898

New Orleans with drainage issues. Prevention first. Be proactive. Not reactive.

Flooding Questionnaire

City of Hattiesburg

Floodplain Management Plan



Background

The City of Hattiesburg is a voluntary member of the Federal Emergency Management Agency's (FEMA's) Community Rating System (CRS) program. Incentives for participation include flood insurance premium discounts. As part of this program, the COH is developing a regional floodplain management plan with a committee comprised of representatives from the city staff, city's population, and stakeholder groups appointed by the Mayor. **It would greatly assist the planning effort if we had information on flooding issues that you have experienced while residing or working in the City.** This information will only be used for internal planning purposes and will not be distributed. If you have questions, please call the COH Planning at (601) 545-4599. Please complete the questionnaire on-line at <http://www.hattiesburgms.com/residents/flood-information/> or mail to the COH Planning at Post Office Box 1819 Hattiesburg, Mississippi 39403-1898, or fax to (601) 545-1962 as soon as possible.

Property address:

316 West 7th Street

Contact information:

Stella Mackabe 601 544-6102

Name

Phone (optional)

Company Name (if applicable)

1. Has your building or property ever been flooded? Yes No
2. When did you move into or occupy the building? 1985
3. In what years (or on what dates) did it flood? _____
4. Where did you get water and how deep did it get?
 - In basement (if applicable): _____ feet deep
 - In crawl space (if applicable): _____ feet deep
 - Over first finished floor: _____ feet deep
 - On land only: _____ feet deep
 - Water kept out of building by sandbagging, sewer valve, other measure.
 - Other: _____
5. What do you feel was the cause of your flooding? Check all affecting your building.
 - Storm sewer backup
 - Sanitary sewer backup
 - Standing water next to house
 - Sump pump failure/power failure
 - Saturated ground/leaks in basement walls
 - Overbank flooding from: Creek River Drainage Ditch
 - Other: _____

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6. Have you installed any flood protection measures on your property'?

- Sump pump
- Overhead sewers, backup valve
- Waterproofed walls
- Regraded property to keep water away from building
- Other: _____
- Backup power system/generator
- Sewer plug or standpipe
- Moved things out of the basement

7. What type of foundation does your building have?

- Slab
- Crawlspace
- Basement

8. To your knowledge, are creeks and/or drainage ditches in your area kept cleaned out and/or maintained on a regular basis? Yes ___/No

If yes, in your opinion does this help with the flood problems? Yes

If no, approximately how often are they are cleaned? when called

9. Please choose one of the types below that best describes your predominate neighborhood type: Business/office ___ Commercial/Retail ___ Government ___

Industrial ___ Residential Mixed Use ___ (predominately ___)

Other (specify) _____

10. Please choose the predominate structure type in your neighborhood:

Concrete ___ Brick ___ Block ___ Wood Frame Pre-Fab ___

Wood/Vinyl Siding Mixed ___ (predominately ___)

Other (specify) _____

11. Do you have flood insurance or a sewer/basement flood rider on your insurance policy? Yes No

12. Do you want information on protecting your building from flooding? Yes No
If yes, please include your name and full mailing address so that we may contact you.

Please include any additional comments, photos (place name and address on each so they may be returned), relevant correspondence, or any other documents that you believe may aid our efforts.

Stella McCreaboe

316 W 7th St

Hattiesburg, MS 39401

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 City of Hattiesburg - Planning Division – Urban Development
 Post Office Box 1898
 Hattiesburg, Mississippi 39403-1898

Flooding Questionnaire

City of Hattiesburg

Floodplain Management Plan



Background

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Property address:

1909 Fuller Street

Contact information:

Ed Brown 601-545-1958

Name

Phone (optional)

Company Name (if applicable)

1. Has your building or property ever been flooded? Yes No
2. When did you move into or occupy the building? 2000
3. In what years (or on what dates) did it flood? _____
4. Where did you get water and how deep did it get?
 - In basement (if applicable): _____ feet deep
 - In crawl space (if applicable): _____ feet deep
 - Over first finished floor: _____ feet deep
 - On land only: _____ feet deep
 - Water kept out of building by sandbagging, sewer valve, other measure.
 - Other _____
5. What do you feel was the cause of your flooding? Check all affecting your building.
 - Storm sewer backup
 - Sanitary sewer backup
 - Standing water next to house
 - Sump pump failure/power failure
 - Saturated ground/leaks in basement walls
 - Overbank flooding from: Creek River Drainage Ditch
 - Other: _____

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6. Have you installed any flood protection measures on your property?

- Sump pump Backup power system/generator
 Overhead sewers, backup valve Sewer plug or standpipe
 Waterproofed walls Moved things out of the basement
 Regraded property to keep water away from building
 Other: _____

7. What type of foundation does your building have?

- Slab Crawlspace Basement

8. To your knowledge, are creeks and/or drainage ditches in your area kept cleaned out and/or maintained on a regular basis? Yes / No (*as far as we know*)

If yes, in your opinion does this help with the flood problems? _____

If no, approximately how often are they are cleaned? _____

9. Please choose one of the types below that best describes your predominate neighborhood

type: Business/office _____ Commercial/Retail _____ Government _____

Industrial _____ Residential Mixed Use _____ (predominately _____)

Other (specify) _____

10. Please choose the predominate structure type in your neighborhood:

Concrete _____ Brick Block _____ Wood Frame _____ Pre-Fab _____

Wood/Vinyl Siding _____ Mixed _____ (predominately _____)

Other (specify) _____

11. Do you have flood insurance or a sewer/basement flood rider on your insurance policy? Yes No

12. Do you want information on protecting your building from flooding? Yes No

If yes, please include your name and full mailing address so that we may contact you.

Please include any additional comments, photos (place name and address on each so they may be returned), relevant correspondence, or any other documents that you believe may aid our efforts.

If Found, Please Return To:

City of Hattiesburg - Planning Division - Urban Development

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Flooding Questionnaire

City of Hattiesburg

Floodplain Management Plan



Background

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Property address: 204 GREENWOOD PLACE
 Contact information: JOSEPH KINNAN 601-550-8219
 Name Phone (optional) 39402
 Company Name (if applicable)

1. Has your building or property ever been flooded? Yes No
2. When did you move into or occupy the building? April 1996
3. In what years (or on what dates) did it flood? NA
4. Where did you get water and how deep did it get?
 - In basement (if applicable): _____ feet deep
 - In crawl space (if applicable): _____ feet deep
 - Over first finished floor: _____ feet deep
 - On land only: _____ feet deep
 - Water kept out of building by sandbagging, sewer valve, other measure.
 - Other _____
5. What do you feel was the cause of your flooding? Check all affecting your building.
 - Storm sewer backup Sanitary sewer backup
 - Standing water next to house Sump pump failure/power failure
 - Saturated ground/leaks in basement walls
 - Overbank flooding from: Creek River Drainage Ditch
 - Other: _____

Thanks for Doing This Joe Kinn

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6. Have you installed any flood protection measures on your property? *NO*
- Sump pump Backup power system/generator
 Overhead sewers, backup valve Sewer plug or standpipe
 Waterproofed walls Moved things out of the basement
 Regraded property to keep water away from building
 Other: _____

7. What type of foundation does your building have?
 Slab Crawlspace Basement

8. To your knowledge, are creeks and/or drainage ditches in your area kept cleaned out and/or maintained on a regular basis? Yes / No
 If yes, in your opinion does this help with the flood problems? Yes
 If no, approximately how often are they are cleaned? _____

9. Please choose one of the types below that best describes your predominate neighborhood type: Business/office _____ Commercial/Retail _____ Government _____
 Industrial _____ Residential Mixed Use _____ (predominately _____)
 Other (specify) _____

10. Please choose the predominate structure type in your neighborhood:
 Concrete _____ Brick _____ Block _____ Wood Frame Pre-Fab _____
 Wood/Vinyl Siding _____ Mixed _____ (predominately _____)
 Other (specify) _____

11. Do you have flood insurance or a sewer/basement flood rider on your insurance policy? Yes No

12. Do you want information on protecting your building from flooding? Yes No
 If yes, please include your name and full mailing address so that we may contact you.

Please include any additional comments, photos (place name and address on each so they may be returned), relevant correspondence, or any other documents that you believe may aid our efforts.

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Flooding Questionnaire

City of Hattiesburg

Floodplain Management Plan



Background

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Property address: 303 Mandalay Dr.

Contact information: Susan King 601-550-7937
Name Phone (optional)

Company Name (if applicable)

1. Has your building or property ever been flooded? Yes No
2. When did you move into or occupy the building? Jan 1985
3. In what years (or on what dates) did it flood? 0
4. Where did you get water and how deep did it get?
 - In basement (if applicable): _____ feet deep
 - In crawl space (if applicable): _____ feet deep
 - Over first finished floor: _____ feet deep
 - On land only: _____ feet deep
 - Water kept out of building by sandbagging, sewer valve, other measure.
 - Other N/A
5. What do you feel was the cause of your flooding? Check all affecting your building.
 - Storm sewer backup
 - Sanitary sewer backup
 - Standing water next to house
 - Sump pump failure/power failure
 - Saturated ground/leaks in basement walls
 - Overbank flooding from: Creek River Drainage Ditch
 - Other: N/A

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6. Have you installed any flood protection measures on your property'?

- Sump pump
- Overhead sewers, backup valve
- Waterproofed walls
- Regraded property to keep water away from building
- Other: _____
- Backup power system/generator
- Sewer plug or standpipe
- Moved things out of the basement

N/A

7. What type of foundation does your building have?

- Slab
- Crawlspace
- Basement

8. To your knowledge, are creeks and/or drainage ditches in your area kept cleaned out and/or maintained on a regular basis? Yes /No

If yes, in your opinion does this help with the flood problems? Yes
If no, approximately how often are they are cleaned? _____

9. Please choose one of the types below that best describes your predominate neighborhood

type: Business/office _____ Commercial/Retail _____ Government _____
Industrial _____ Residential Mixed Use _____ (predominately _____)
Other (specify) _____

10. Please choose the predominate structure type in your neighborhood:

Concrete _____ Brick Block _____ Wood Frame _____ Pre-Fab _____
Wood/Vinyl Siding _____ Mixed _____ (predominately _____)
Other (specify) _____

11. Do you have flood insurance or a sewer/basement flood rider on your insurance policy? Yes No

12. Do you want information on protecting your building from flooding? Yes No
If yes, please include your name and full mailing address so that we may contact you.

Please include any additional comments, photos (place name and address on each so they may be returned), relevant correspondence, or any other documents that you believe may aid our efforts.

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6. Have you installed any flood protection measures on your property'?

- | | |
|---|---|
| <input type="checkbox"/> Sump pump | <input type="checkbox"/> Backup power system/generator |
| <input type="checkbox"/> Overhead sewers, backup valve | <input type="checkbox"/> Sewer plug or standpipe |
| <input type="checkbox"/> Waterproofed walls | <input type="checkbox"/> Moved things out of the basement |
| <input type="checkbox"/> Regraded property to keep water away from building | |
| <input type="checkbox"/> Other: _____ | |

7. What type of foundation does your building have?

- Slab Crawlspace Basement

8. To your knowledge, are creeks and/or drainage ditches in your area kept cleaned out and/or maintained on a regular basis? Yes ___/No ___

If yes, in your opinion does this help with the flood problems? _____

If no, approximately how often are they are cleaned? _____

9. Please choose one of the types below that best describes your predominate neighborhood type: Business/office _____ Commercial/Retail _____ Government _____

Industrial _____ Residential Mixed Use _____ (predominately _____)

Other (specify) _____

10. Please choose the predominate structure type in your neighborhood:

Concrete _____ Brick Block _____ Wood Frame _____ Pre-Fab _____

Wood/Vinyl Siding _____ Mixed _____ (predominately _____)

Other (specify) _____

11. Do you have flood insurance or a sewer/basement flood rider on your insurance policy? Yes No

12. Do you want information on protecting your building from flooding? Yes No

If yes, please include your name and full mailing address so that we may contact you.

Please include any additional comments, photos (place name and address on each so they may be returned), relevant correspondence, or any other documents that you believe may aid our efforts.

I think that the rock wall on my side of the creek needs to be taller AND the drainage ditch that runs next to Mrs.

Poirer's house (507 S 21st Ave) needs to be deeper. i have attached several photos.

Shannon Corey

601-520-3000

If Found, Please Return To:

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Hattiesburg, Mississippi 39403-1898

St

Adeline St

Gordon's Creek

105

503 South 21st Avenue

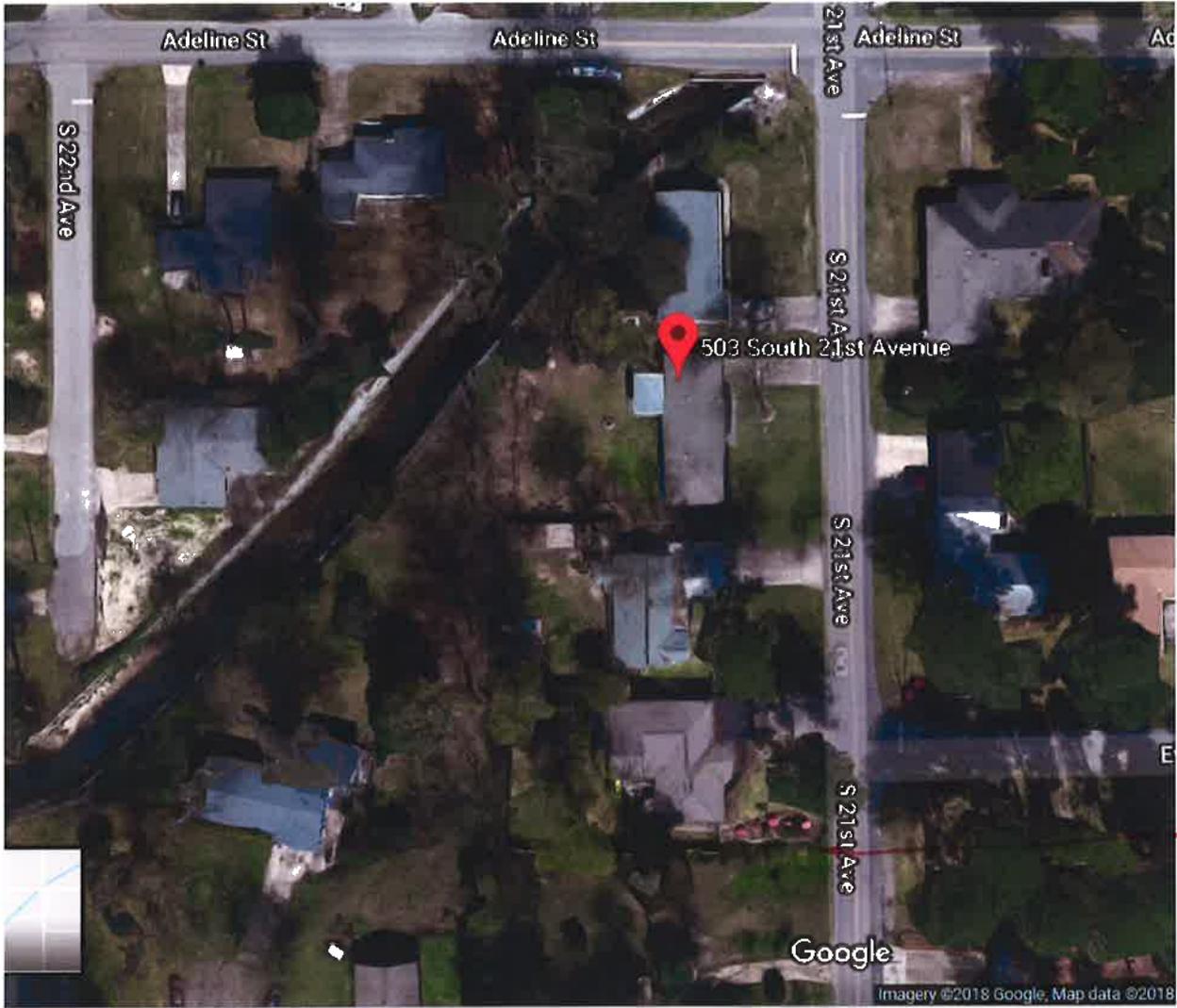
S 21st Ave

Everg

drainage ditch

When the creek gets full, the drainage ditch can't flow into it and backs up.

When that happens, the water runs over into our yards. My Shed + all ~~the~~ contents were destroyed and my chain link fence was damaged. The water actually caused the posts to come up out of the ground.



drainage ditch



4/2016

503 S. 21st Ave.

Patio



4/2016
503 S. 21st Ave
Patio

Shed
Water line (3 feet)
503 S. 21st Ave.

503

503 S. 21st Ave
Back fence



Shed
503 S. 21st Ave
Water line (3 feet)



503 S. 21st Ave.
inside of back
fence



503 S. 21st Ave
This is the gate
to my front yard.



503 S. 21st Ave
(Fence between my
yard + my yard).
Neighbor's yard.
moat of the water
came from this²
direction.)



4/17/17

Back yard - water
has NO WHERE
to go.
503 S. 21st Ave



4/17/17
503 S. 21st Ave
Backyard



Flooding Questionnaire

City of Hattiesburg Floodplain Management Plan



Background

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Property address: 3006 Raphael Dr

Contact information: Susan Straus

Name Phone (optional)

Company Name (if applicable)

1. Has your building or property ever been flooded? Yes No
2. When did you move into or occupy the building? 1984
3. In what years (or on what dates) did it flood? Whenever we get a steady 3-4 day rain - pictures are from March 2016
4. Where did you get water and how deep did it get? (Our streets flood as well)
 - In basement (if applicable): _____ feet deep
 - In crawl space (if applicable): _____ feet deep
 - Over first finished floor: _____ feet deep
 - On land only: 1-2 feet deep
 - Water kept out of building by sandbagging, sewer valve, other measure.
 - Other prayed it would stop raining
5. What do you feel was the cause of your flooding? Check all affecting your building.
 - Storm sewer backup Sanitary sewer backup
 - Standing water next to house Sump pump failure/power failure
 - Saturated ground/leaks in basement walls
 - Overbank flooding from: Creek River Drainage Ditch
 - Other: Water comes from Kirkwood / Waterford - runs through our smaller ditches. We are their outlet to Gordons Creek.

If Found, Please Return To:
 City of Hattiesburg - Planning Division - Urban Development
 Post Office Box 1898
 Hattiesburg, Mississippi 39403-1898

6. Have you installed any flood protection measures on your property?

- Sump pump
- Overhead sewers, backup valve
- Waterproofed walls
- Regraded property to keep water away from building
- Other: _____
- Backup power system/generator
- Sewer plug or standpipe
- Moved things out of the basement

7. What type of foundation does your building have?

- Slab
- Crawlspace
- Basement

8. To your knowledge, are creeks and/or drainage ditches in your area kept cleaned out and/or maintained on a regular basis? Yes ___/No X

If yes, in your opinion does this help with the flood problems? _____

If no, approximately how often are they are cleaned? if I call the city will come remove large items dumped in the ditches - but no they are never

9. Please choose one of the types below that best describes your predominate neighborhood type: Business/office ___ Commercial/Retail ___ Government ___ Industrial ___ Residential X Mixed Use ___ (predominately _____) Other (specify) _____

10. Please choose the predominate structure type in your neighborhood:

Concrete ___ Brick ___ Block ___ Wood Frame ___ Pre-Fab ___ Wood/Vinyl Siding ___ Mixed X (predominately brick, -wood) Other (specify) _____

11. Do you have flood insurance or a sewer/basement flood rider on your insurance policy? Yes No

12. Do you want information on protecting your building from flooding? Yes No
If yes, please include your name and full mailing address so that we may contact you.

J. Straus
3006 Raphael Dr. Hattiesburg MS 39402

Please include any additional comments, photos (place name and address on each so they may be returned), relevant correspondence, or any other documents that you believe may aid our efforts.

you don't need to return photos - these were taken after
the rain stopped! It took 2+ hours to drain.
I have video too!

If Found, Please Return To:

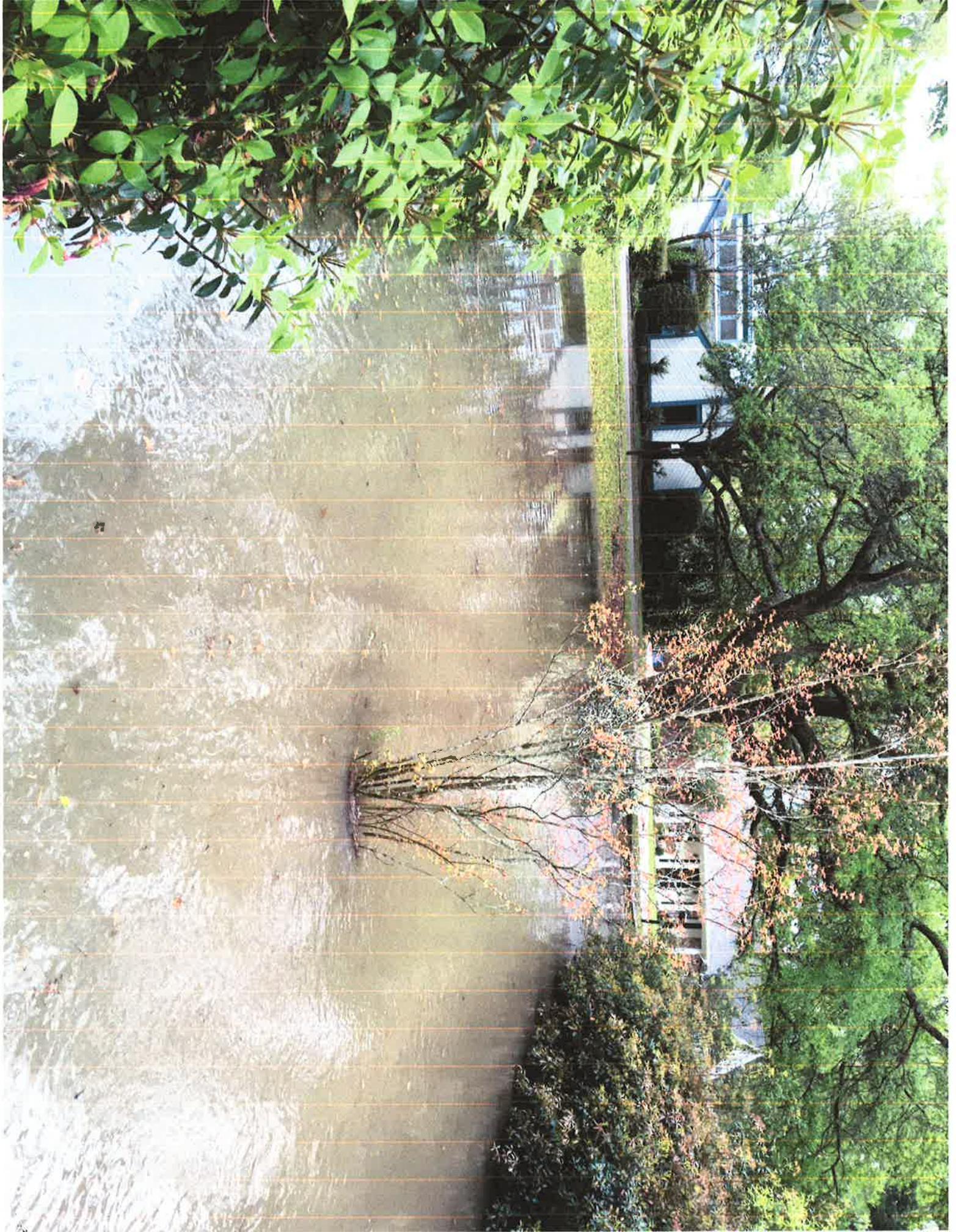
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Post Office Box 1898
Hattiesburg, Mississippi 39403-1898



ditch between 3004 - 3006 Raphael

this is small ditch that water from Kirkwood / Waterford

run through



ditch between 3006-3004 Raphael

This is small ditch water from Kirkwood / Waterford
runs through



Overflow from Ditch between 103-105 Dover Cliff



Overflow between 103 - 105 Dovercliff +
water running down alley

This is the ditch water from Kirkwood / Waterford comes thru





Raphael / New England

Street

Intersection flooded

Flooding Questionnaire

City of Hattiesburg

Floodplain Management Plan

Background

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Property address: 422 Mobile Street

Contact information: Melvin L. Williams 601-447-7102
Name Phone (optional)
N/A.
Company Name (if applicable)

1. Has your building or property ever been flooded? Yes No
if "yes," please complete this entire questionnaire.
If "no," please complete questions 6 - 9.

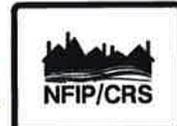
2. In what years (or on what dates) did it flood? _____
10 years ago.

3. Where did you get water and how deep did it get?
- In basement (if applicable): _____ feet deep
- In crawl space (if applicable): 1/2-1 feet deep
- Over first finished floor: 1/2-1 feet deep
- On land only: _____ feet deep
- Water kept out of building by sandbagging, sewer valve, other measure.
- Other _____

4. What do you feel was the cause of your flooding? Check all affecting your building.
- Storm sewer backup Sanitary sewer backup
- Standing water next to house Sump pump failure/power failure
- Saturated ground/leaks in basement walls
- Overbank flooding from _____ Creek/River
- Other: Flash Flood.

If Found, Please Return To:

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Flooding Questionnaire

City of Hattiesburg

Floodplain Management Plan

Background

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Property address: 1212 Deency St. Hattiesburg, MS 39401

Contact information: Sinde Williams 601-325-4207

Name Phone (optional)

N/A

Company Name (if applicable)

1. Has your building or property ever been flooded? Yes No
 if "yes," please complete this entire questionnaire.
 If "no," please complete questions 6 - 9.

2. In what years (or on what dates) did it flood? 1974

3. Where did you get water and how deep did it get?

In basement (if applicable): _____ feet deep

In crawl space (if applicable): _____ feet deep

Over first finished floor: 2 feet deep

On land only: 2 feet deep

Water kept out of building by sandbagging, sewer valve, other measure.

Other _____

4. What do you feel was the cause of your flooding? Check all affecting your building.

Storm sewer backup Sanitary sewer backup

Standing water next to house Sump pump failure/power failure

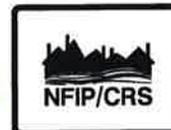
Saturated ground/leaks in basement walls

Overbank flooding from _____ Creek/River

Other: High Flood

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Flooding Questionnaire

City of Hattiesburg

Floodplain Management Plan



Background

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Property address:

1303. Benjamin St

Contact information:

Allen Shaker 601 408-1159
Name Phone (optional)

Company Name (if applicable)

- Has your building or property ever been flooded? Yes No
- When did you move into or occupy the building? 1979
- In what years (or on what dates) did it flood? N/A
- Where did you get water and how deep did it get?
 - In basement (if applicable): N/A feet deep
 - In crawl space (if applicable): N/A feet deep
 - Over first finished floor: N/A feet deep
 - On land only: N/A feet deep
 - Water kept out of building by sandbagging, sewer valve, other measure.
 - Other _____
- What do you feel was the cause of your flooding? Check all affecting your building.
 - Storm sewer backup Sanitary sewer backup
 - Standing water next to house Sump pump failure/power failure
 - Saturated ground/leaks in basement walls
 - Overbank flooding from: Creek River Drainage Ditch
 - Other: _____

If Found, Please Return To:

City of Hattiesburg - Planning Division - Urban Development
Post Office Box 1898
Hattiesburg, Mississippi 39403-1898

6. Have you installed any flood protection measures on your property'?

- Sump pump Backup power system/generator
 Overhead sewers, backup valve Sewer plug or standpipe
 Waterproofed walls Moved things out of the basement
 Regraded property to keep water away from building
 Other: _____

7. What type of foundation does your building have?

- Slab Crawlspace Basement

8. To your knowledge, are creeks and/or drainage ditches in your area kept cleaned out and/or maintained on a regular basis? Yes /No

If yes, in your opinion does this help with the flood problems? _____
If no, approximately how often are they are cleaned? _____

9. Please choose one of the types below that best describes your predominate neighborhood

type: Business/office _____ Commercial/Retail _____ Government _____
Industrial _____ Residential Mixed Use _____ (predominately _____)
Other (specify) _____

10. Please choose the predominate structure type in your neighborhood:

Concrete _____ Brick Block _____ Wood Frame _____ Pre-Fab _____
Wood/Vinyl Siding _____ Mixed _____ (predominately _____)
Other (specify) _____

11. Do you have flood insurance or a sewer/basement flood rider on your insurance policy? Yes No

12. Do you want information on protecting your building from flooding? Yes No
If yes, please include your name and full mailing address so that we may contact you.

Please include any additional comments, photos (place name and address on each so they may be returned), relevant correspondence, or any other documents that you believe may aid our efforts.

If Found, Please Return To:

City of Hattiesburg - Planning Division - Urban Development
Post Office Box 1898
Hattiesburg, Mississippi 39403-1898

Flooding Questionnaire

City of Hattiesburg

Floodplain Management Plan



Background

The City of Hattiesburg is a voluntary member of the Federal Emergency Management Agency's (FEMA's) Community Rating System (CRS) program. Incentives for participation include flood insurance premium discounts. As part of this program, the COH is developing a regional floodplain management plan with a committee comprised of representatives from the city staff, city's population, and stakeholder groups appointed by the Mayor. **It would greatly assist the planning effort if we had information on flooding issues that you have experienced while residing or working in the City.** This information will only be used for internal planning purposes and will not be distributed. If you have questions, please call the COH Planning at (601) 545-4599. Please complete the questionnaire on-line at <http://www.hattiesburgms.com/residents/flood-information/> or mail to the COH Planning at Post Office Box 1819 Hattiesburg, Mississippi 39403-1898, or fax to (601) 545-1962 as soon as possible.

Property address: 718 1/2 E. 6th Street

Contact information: Mattie L. McDonald

Name Phone (optional)

Company Name (if applicable)

1. Has your building or property ever been flooded? Yes No
2. When did you move into or occupy the building? _____
3. In what years (or on what dates) did it flood? 1974, 1961
4. Where did you get water and how deep did it get?
 - In basement (if applicable): _____ feet deep
 - In crawl space (if applicable): _____ feet deep
 - Over first finished floor: 3 feet deep
 - On land only: _____ feet deep
 - Water kept out of building by sandbagging, sewer valve, other measure.
 - Other _____
5. What do you feel was the cause of your flooding? Check all affecting your building.
 - Storm sewer backup
 - Standing water next to house
 - Saturated ground/leaks in basement walls
 - Overbank flooding from: Creek River Drainage Ditch
 - Other: _____
 - Sanitary sewer backup
 - Sump pump failure/power failure

If Found, Please Return To:
City of Hattiesburg - Planning Division - Urban Development
Post Office Box 1898
Hattiesburg, Mississippi 39403-1898

6. Have you installed any flood protection measures on your property?

- Sump pump
 Overhead sewers, backup valve
 Waterproofed walls
 Regraded property to keep water away from building
 Other: Raised Foundation
- Backup power system/generator
 Sewer plug or standpipe
 Moved things out of the basement

7. What type of foundation does your building have?

- Slab
 Crawlspace
 Basement

8. To your knowledge, are creeks and/or drainage ditches in your area kept cleaned out and/or maintained on a regular basis? Yes /No

If yes, in your opinion does this help with the flood problems? yes
If no, approximately how often are they are cleaned? _____

9. Please choose one of the types below that best describes your predominate neighborhood type: Business/office _____ Commercial/Retail _____ Government _____
Industrial Residential Mixed Use _____ (predominately residential)

Other (specify) _____

10. Please choose the predominate structure type in your neighborhood:

- Concrete _____ Brick _____ Block _____ Wood Frame Pre-Fab _____
Wood/Vinyl Siding Mixed _____ (predominately _____)
Other (specify) _____

11. Do you have flood insurance or a sewer/basement flood rider on your insurance policy? Yes No

12. Do you want information on protecting your building from flooding? Yes No
If yes, please include your name and full mailing address so that we may contact you.

Please include any additional comments, photos (place name and address on each so they may be returned), relevant correspondence, or any other documents that you believe may aid our efforts.

If Found, Please Return To:
City of Hattiesburg - Planning Division - Urban Development
Post Office Box 1898
Hattiesburg, Mississippi 39403-1898



[Details](#)
[Reports](#)

File #: 2018-1045 **Version:** 1 **Name:** Authorize FMP's revisions to the Regional Multi-Hazard Mitigation Plan
Type: Regular Agenda Item **Status:** Agenda Ready
File created: 12/10/2018 **In control:** [City Council](#)
On agenda: 12/18/2018 **Final action:**
Title: Acknowledge the proposal of the **Floodplain** Management Plan (FMP) Committee's proposed revisions to the Regional Multi-Hazard Mitigation Plan and authorize submittal to Forrest County for inclusion in the 5-year renewal of the regional plan due in early 2019. (Resolution # 2018-75 appointed FMP and PPI Committees)
Attachments: 1. [chapter1 - Draft 2018 update](#), 2. [chapter2 - Draft 2018 update](#), 3. [chapter3 -Draft 2018 update](#), 4. [chapter4 - Draft 2018 update](#), 5. [chapter5 - Draft 2018 update](#), 6. [chapter6 - Draft 2018 update](#)

[History \(0\)](#)
[Text](#)

0 records

Date ▾	Ver.	Action By	Action	Result	Action Details	Meeting Details	Video
No records to display.							

HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019
EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED

Introduction –

Purpose

The purpose of the Hazard Mitigation Plan is to protect the residents of Forrest County by lowering the risks and reducing the effects of disasters on critical facilities by identifying and implementing mitigation strategies that will reduce or prevent catastrophic damages, casualties, physical and/or financial losses.

Acknowledgements

~~Kara W. Drane, AICP, Forrest County Planning Director; Corey Proctor, Forrest County Senior Planner and Kyle Hopkins, Emergency Management District prepared this plan with assistance from Emergency Management District, City of Hattiesburg and the City of Petal. We wish to acknowledge the valuable contributions of these committees and individuals:~~

Forrest County

Board of Supervisors

David Hogan, President - District 1

Charles Marshall - District 2

Burkett Ross - District 3

Roderick Woullard, Vice President - District 4

Chris Bowen - District 5

Designated Members on the Hazard Mitigation Council:

~~Kara W. Drane, AICP, Planning Director~~

~~Corey Proctor, Senior Planner~~

~~Raylawni Branch, District 2 Representative~~

~~Hardy Thorne, District 4 Representative~~

~~Don Harvey, District 5 Representative~~

City of Hattiesburg

Mayor and City Council

~~Johnny L. DuPree, Mayor~~

~~Kim Bradley, President – Ward 1~~

~~Deborah Denard Delgado, Ward 2~~

~~Carter Carroll, Ward 3~~

~~Dave Ware, Vice President – Ward 4~~

~~Henry E. Naylor, Ward 5~~

HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019
EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED

Designated Members on the Hazard Mitigation Council:

Lisa Reid, CFM, Hattiesburg Urban Development Department
~~Justin Heskeu, Historic Preservation Planner~~
~~Wayne Landers, Forrest General Hospital~~
~~Rodney Gresham, Wesley Medical Center~~
~~Glenn and/or Roman Galey, South Group Insurance Services~~

City of Petal

Mayor and Board of Aldermen

Hal Marx, Mayor
~~David Clayton, Ward 1~~
~~Steve Stringer, Ward 2~~
~~James Runnels, Ward 3~~
~~Tony Ducker, Ward 4~~
~~Craig Bullock, Aldermen at Large~~

Designated Member(s) on the Hazard Mitigation Council

~~Joe Hendry, Fire Chief~~
~~Brad Amacker, Petal School District~~
~~Steve Hampton, Petal School District~~
~~Beth Johnson, Retired, Emergency Management District~~

The Emergency Management District

Emergency Management Council

~~Billy Magee, Forrest County Sheriff – Council President~~
~~Wayne Landers, Forrest General Hospital Public Safety Chief – Vice President~~
~~Frazier Bolton, Hattiesburg Police Department – Secretary/Treasurer~~
~~David Webster, Hattiesburg Fire Department~~
~~Rodger Jackson, University of Southern Mississippi~~
~~Wade Spruill, AAA Ambulance Service Director~~
~~John Freeman, Representative At Large~~
~~Terry Steed, Emergency Management District Director~~
~~Sandie Ethridge, Administrative Officer~~
~~Jerry Evans, Council Attorney~~

Designated Member(s) on the Hazard Mitigation Council:

~~Kyle Hopkins, Operations Officer~~

2. Plan Approach

Plan Process and Public Involvement

The ~~2013-2019~~ Multi-Jurisdictional Hazard Mitigation Plan was developed in an effort to address multiple hazard threats that could affect Forrest County and all cities and communities within the County. The process to develop this plan was done over a **1 ½ year period beginning in 2011** that included the update of a Hazard Mitigation Council. This Council was formed by resolution of each participating jurisdiction in ~~2012-2019~~ and public hearings were held in ~~2012 and 2013~~ 2018 & 2019. Copies of the resolutions from Forrest County, the City of Hattiesburg and the City of Petal are attached as Appendix A. The Emergency Management District does not have boards that would enact such actions; therefore, their participation was not done by resolution.

Involvement from Participating Jurisdictions

The Committee determined early in the process that the most expedient way to proceed was to divide the responsibilities of the planning elements among the participating jurisdictions. The City of Hattiesburg, City of Petal and Forrest County representatives gathered updated development information and statistics and met with various stakeholders. The Emergency Management District gathered history of past events, and Forrest County started the data entry, maintenance and mapping of all gathered information.

The Forrest County Planning Department did additional data collection and developed the plan with assistance from the City of Hattiesburg and with input from members of the Hazard Mitigation Council. The process of completing the plan was recommended through guidelines set forth through 44 CFR Parts 201 and 206.

**HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019**

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NEW FMP COMMITTEE GOALS HIGHLIGHTED**

Local Agencies

- Agriculture Dept Forrest/Perry County
- American Red Cross
- Area Development Partnership
- Army National Guard
- AAA Ambulance Service
- American Disability Act
- Bell South
- Comcast Cable
- Forrest County Extension Service
- Forrest County Board of Supervisors
- Forrest County School District
- Forrest County Road Manager
- Forrest County Tax Assessor
- Forrest County Sheriff's Office
- Forrest County DHS
- Forrest General Hospital
- Forrest Co Maintenance
- Forrest County Planner
- Forrest County Supervisor Dist 4
- Forrest County Business Leader
- Forrest County Health Dept
- Forrest County VFD
- Greater Hattiesburg Home Association
- Hattiesburg School District
- Hattiesburg Urban Development
- Hattiesburg Mass Transit
- Hattiesburg City Attorney
- Hattiesburg City Forester
- Hattiesburg Councilwoman
- Hattiesburg Fire Department
- Hattiesburg Neighborhood Programs
- Hattiesburg Recreation
- Hattiesburg Water
- Hattiesburg CRS
- Hattiesburg Bldg/Maintenance
- Hattiesburg Police Department
- Hattiesburg Engineering
- Hattiesburg Citizen
- Hattiesburg MPO
- Hattiesburg GIS
- Hercules Corp
- MEMA
- Mississippi Power Company
- Mississippi Fisheries and Parks
- Mississippi Tank Co
- MDOT
- Media
- Neel – Schaffer, Inc.
- Pat Harrison Waterway District
- Pearl River Community College
- Pearl River Valley EPA
- Petal Police Department
- Petal School District
- Petal Fire Department
- Petal, City of
- Petal Dome Storages
- Railroad
- Resinall Corp
- Salvation Army
- Shows, Dearman & Waits
- South MS Electric PA
- Sunbeam-Oster
- The Emergency Management District
- United Way of SE MS

**HAZARD MITIGATION PLAN
MAY 2007**

- USM
- Water Association
- Wesley Medical
- Willmut Gas
- William Carey College
- Zeon Chemicals

Neighborhood Associations

- Arcadia-Sunset
- Arledge Subdivision
- Avenues
- Audubon-Kirkwood Park
- Audubon-Westwood
- Baywood Cove Homeowners
- Briarfield Apts.
- City Park Circle
- Concerned Citizens of Palmer's Crossing
- Classic Drive/Country Club Lane
- Country Club Lake Estates Homeowners
- Duane-Myrtle
- Dixie Community
- East Jerusalem Enhancement
- Grace Avenue-Northhills Dr.
- Historic Hattiesburg Downtown Association
- Hattiesburg Historic Neighborhood
- Hope Drive
- The Highlands
- Innswood Homeowners
- Irene Chapel
- Jamestown-Lincoln
- Kamper Avenues
- Katie-John-Dabbs
- Lilac Estates
- Lincoln Road-South 28th Ave.
- Longstreet
- Midway Subdivision
- Mobile-Bouie Neighborhood
- Mt. Olive-Tatum-Lillie Burney
- Newman-Buschman Neighborhood
- North Main Historic District
- Oaks Historic District
- Parkhaven Neighborhood
- Pinehills Neighborhood Assn
- Pinehurst Neighborhood
- Robertson Place
- Southern Heights
- The Cottages at Turtle Creek
- The Height-Avenues
- Timberton Property Owners Association
- Timberton Park Neighborhood
- Unified Neighborhood Assn.
- University Heights
- Westgate Neighborhood
- Woodhaven Lake Estates

**HAZARD MITIGATION PLAN
APRIL 2013**

Hazard Mitigation Council

Hazard Mitigation Council gained input from different segments of the community that included citizens, public officials, stakeholders and other interested groups. Appendix B, Hazard Mitigation Council Meeting Sign-in Sheets; Appendix C, Public Hearings; and Appendix D, Survey Instrument and Critical Facility Questionnaire further demonstrate the process used in developing this plan. Table 2 –1 Public Hearing Data shows dates, locations and purposes of public hearings. The committee meeting dates and purposes are listed in Table 2 – 2, Hazard Mitigation Council Meetings.

All meetings held during the planning process focused on but were not limited to the following: assessing hazards, completing hazard profiles, distributing and collecting questionnaires, and completing neighborhood/critical facility profiles. A preliminary draft document was then presented to Boards, Mayors, Aldermen and Council in ~~October 2012~~ December 2018 (for H'burg only). Revisions to the preliminary draft document were made later in ~~October 2012~~ _____, 2019. A draft of the plan was submitted for FEMA approval in ~~August 2013~~ _____, 2019.

Public notices were placed in the local newspaper on August 15, 2012 in the legal section and on September 12, 2012 in a block ad in the non-legal section. Proofs of publication and public hearing data are located in Appendix C. A public hearing was held on September 25, 2012.

Table 2 –1, Public Hearings, Hazard Mitigation Plan 2012 – 2018

Date	Time	Organizations	Location	Purpose of Public Hearings
8/28/2012 Cancelled	6:00 PM	All Three Jurisdictions	Hattiesburg Intermodal Facility	Draft Plan
9/25/2012	6:00 PM	All Three Jurisdictions	Hattiesburg Intermodal Facility	Draft Plan
September 2013	6:00 PM	Forrest County	Board Room	Final Plan
September 2013	4:00 PM	City of Hattiesburg	City Council Room	Final Plan
September 2013	10:00 AM	Forrest County	Board Room	Final Plan

**HAZARD MITIGATION PLAN
APRIL 2013**

Table 2 –2, Multi-Hazard Mitigation Planning Committee Meetings – Updated Plan

Date	Time	Purpose
6/27/2008	1:00 PM	Bi-Annual Review Meeting at Chancery Building
1/3/2012	2:00 PM	Work Session to Discuss Updating Plan
2/28/2012	10:00 AM	First Mitigation Strategy Meeting - Review Goals and Review Possible Activities
7/26/2012	10:00 AM	Second Mitigation Strategy Meeting - Characterize and Evaluate Initiatives and Analyze Strategies.
8/28/2012	2:00PM	Public Hearing – Postponed due to Hurricane Isaac
9/25/2012	3:30 PM	Public Hearing on Draft Plan/Discussion with Plan with Hazard Mitigation Council Members
2/1/2013	9:00 AM & 10:30 AM	Third Mitigation Strategy Meeting with Cities and County to Review Chapter 5 of Draft Plan
3/28/2013	4:00 PM	Final Mitigation Strategy Meeting with Hazard Mitigation Council
4/9/2013	4:00 PM	Final Hazard Mitigation Council Review of Draft Plan
October 2013	TBD	Public Hearing to receive public input and comments on Draft Plan.

Data Compilation and Analysis

This plan is a combined effort of Forrest County, the City of Hattiesburg, the City of Petal and the Emergency Management District. Each participating jurisdiction has plans and reports that were reviewed by the Hazard Mitigation Council during the drafting of the plan. These documents specifically include the following:

- City of Hattiesburg – Comprehensive Plan, Zoning Ordinance, Subdivision Ordinance, Floodplain Ordinance, Stormwater Ordinance, Disaster Preparedness Plan, MPO Transportation Plan, Building Codes.
- City of Petal – Comprehensive Plan, Zoning Ordinance, Subdivision Ordinance, Floodplain Ordinance, Stormwater Ordinance, Disaster Preparedness Plan, MPO Transportation Plan, Building Codes.
- Forrest County – Subdivision Ordinance, Floodplain Ordinance, Stormwater Ordinance, Disaster Preparedness Plan, MPO Transportation Plan.
- Emergency Management District – CEMP, Disaster Preparedness Plan, MPO Transportation Plan.

HAZARD MITIGATION PLAN
APRIL 2013

A number of different sources were used to compile the table and charts included in this plan. Data was obtained from the National Oceanic and Atmospheric Organization (NOAA), the National Hurricane Center, United States Geologic and Soil Service (USGS), Central United States Earthquake Consortium (CUSEC) and other public agencies. Forrest County was responsible for data entry research and map creation, while the City of Hattiesburg distributed hazard mitigation materials, coordinated the meetings and compiled survey results. These surveys consisted of critical facilities profiles, organization information and vulnerability assessments. A copy of these forms is behind Appendix D: Survey Instrument and Critical Facility Questionnaire. Emergency Management played a key role in providing research and previous storm data, with correspondence to business and agencies.

3. Hazards and Vulnerability Analysis

Overview

Planning Area

Forrest County is located in the southeast Mississippi approximately sixty (60) miles from the Mississippi Gulf Coast and approximately ninety (90) miles from the state capital of Jackson. Forrest County encompasses 467 square miles and extends approximately 36 miles north to south and 18 miles east to west at the widest points. Forrest County's 2010 population was 74,934 that equates to approximately 160 people per square mile. The 2012 Census estimate shows an increase of population to 76,894. This marks an increase of 0.6%. Forrest County is bounded by Lamar and Pearl River counties to the west, to the north by Jones and Covington counties, to the east by Perry County, and to the south by Stone County. See Map 3 – 1.

Forrest County is located near the center of the southeast portion of Mississippi. The City of Hattiesburg is the county seat and is known as the “Hub City” because of its strategic location between New Orleans, Louisiana; Mobile, Alabama; Gulfport, Mississippi; and Jackson, Mississippi. The County is well served with a transportation network that includes one interstate highway and three U.S. highways. Interstate 59 is a north-south route that enters the County from Pearl River County to the southwest and runs in a northeasterly direction through Forrest County into Jones County to the north. U.S. Highway 49 bisects Forrest County from the southeast corner of the County to the northwest corner. U.S. Highway 11 is also a north-south route, while U.S. 98 is an east-west route. State Highways 42 and 13 are both east-west routes. Highway 42 is in the northern most portion of the County while Highway 13 is in the southern most portion of the County.

Current Conditions

Existing Land Uses

According to the Forrest County Soil and Water Conservation District, Forrest County is comprised of several major soil types that include: McLaurin, Prentiss, and Heidel. These soils support 200,000 acres of forestry, 22,500 acres of cropland, 40,000 acres of pastureland, and 37,500 acres of urban areas.

The land use in Forrest County includes high density areas in the northern portion of the county in the urbanized areas of the City of Hattiesburg and the City of Petal. Other urban land use areas of Forrest County include the Rawl Springs and Glendale neighborhoods in the northern area of the county. Other areas of Forrest County are

HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019
EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED

very rural in nature and have very low density residential and agricultural land uses. In the central area of Forrest County is the Dixie community and in the southern area are the Brooklyn and Maxie communities. The Emergency Management District's responsibilities cover all of these urban and rural areas.

The majority of residential developments in the unincorporated areas of Forrest County are located in the urbanized area around the City of Hattiesburg and the City of Petal. Map 3 – 15, Residential Developments reflects these new subdivisions in the northern part of the county.

The City of Hattiesburg has low, medium and high density residential and commercial land uses. The higher density developments are generally along major arterials and the lower density residential and commercial land uses are along local and collector arterials. Neighborhood associations located throughout Hattiesburg are shown in Map 3 –14. Agricultural land use is located along the floodplain properties on the east part of the City. Industrial land use is mostly located in the Industrial Park in the southern area of the City and in some portions adjacent to the agricultural land along the east side of Hattiesburg.

The City of Petal is mostly comprised of a mixture of single family residential, commercial and educational institutions. A 2004 study done by Neel-Schaffer, Inc. yielded the following land use classifications:

- Agricultural
- Single-Family Residential
- Multi-Family Residential
- Mobile Homes
- Commercial
- Industrial
- Public Facilities
- Educational
- Recreational
- Cemetery
- Religious
- Emergency Services
- Utilities
- Undeveloped

A majority of new commercial land use is heavily concentrated along the Evelyn Gandy Parkway. These developments range from large commercial centers to medical offices and local banks. Table 3 - 1, City of Petal Existing Land Use and Vacant Land Analysis shows each classification, the acreage, and the percentage of the total acreage.

Existing Zoning

Map 3 – 3, City of Hattiesburg Zoning shows the zoning classifications and distribution of the classifications. The majority of the regional commercial zoning is along major

HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019
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NEW FMP COMMITTEE GOALS HIGHLIGHTED

transportation corridors. The zoning map also reflects neighborhood commercial zoning adjacent to residential areas. Map 3 – 14, City of Hattiesburg Neighborhood Associations has 27 neighborhoods and their location in the City.

Map 3-2 depicts the City of Petal has zoning. Similar to the City of Hattiesburg, the City of Petal has commercial zoning in areas along major transportation routes with lighter commercial areas adjacent to residential areas. The unincorporated areas of Forrest County do not have zoning.

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**HAZARD MITIGATION PLAN
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 NEW FMP COMMITTEE GOALS HIGHLIGHTED**

Table 3 –1, City of Petal Existing Land Use and Vacant Land Analysis

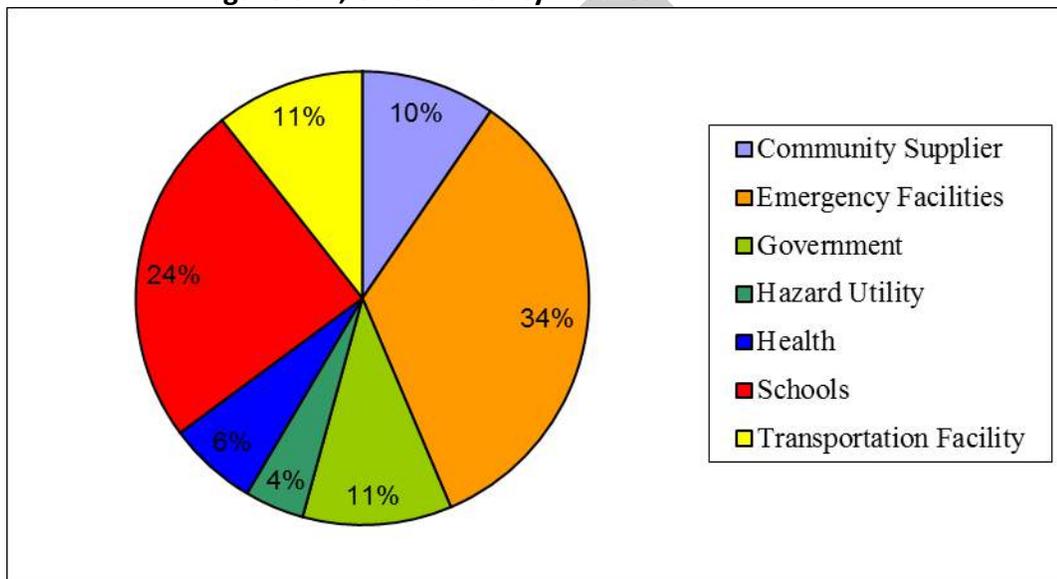
Land Use	Acreage	% Of the Total Acreage
Agricultural	308.15	2.95%
Single-Family Residential	3,748.64	35.91%
Multi-Family Residential	34.25	0.33%
Mobile Homes	241.67	2.31%
Commercial	565.19	5.41%
Industrial	150.12	1.44%
Public Facilities	21.72	0.21%
Educational	52.62	0.50%
Recreational	42.63	0.41%
Cemetery	24.29	0.23%
Religious	98.66	0.95%
Emergency Services	3.96	0.04%
Utilities	11.58	0.11%
Undeveloped	5,135.98	49.20%
Total	10,439.46	100.00%

Source: Neel-Schaffer, Inc., 2004

Existing Vulnerable Buildings, Infrastructure and Critical Facilities

Critical Facilities are defined for the purpose of this document as those facilities essential to the preservation of life and property during a disaster and or those facilities critical to the continuity of government as well as those necessary to ensure timely recovery. Figure 3 -1, Critical Facility Profiles reflect seven categories that critical facilities are classified. The two largest percentages are Emergency Facilities at 34% and Schools at 24%. Refer to Appendix N for Critical Facilities Vulnerability Assessments.

Figure 3 -1, Critical Facility Profiles



Source: Critical Facility Profile Survey, 2003. Updated: August 2013.

Vulnerable Historic and Cultural Features

Historic properties provide aesthetic as well as economic benefits to communities. The act of preserving these properties is referred to as historic preservation. Historic preservation brings people in a community together in an effort to restore and/or maintain community heritage. Historic Preservation is not only limited to buildings and monuments, but also cultural resources. These resources are items such as artwork or artifacts. According to 36 CFR Part 800.16[1] [1], a historic property is defined as a any prehistoric or historic district, site, building, structure or object included or eligible for inclusion in the National Register of Historic Places. The Secretary of the Interior maintains the National Register.

**HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019**

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NEW FMP COMMITTEE GOALS HIGHLIGHTED**

There are fifteen locations in Forrest County that are on the National Register of Historic Places. Approximately ten of the fifteen are located in the City of Hattiesburg with six of them in historic districts. Refer to Map 3-4, City of Hattiesburg National Register Historic Districts for a spatial representation of these properties. The remaining five properties are in Forrest County, two of which are at Camp Shelby. The Table 3 –2, Forrest County Properties on the National Register of Historic Places lists all the properties in the County with the date of designation to the National Register.

Table 3- 2, Forrest County Properties on the National Register of Historic Places

Location	Date of Designation
Beverly Drive-In Theatre	30-Jul-08
Building 1071, Camp Shelby Hattiesburg Vic.	2-Sep-97
Building 6981, Camp Shelby Hattiesburg Vic.	11-Jun-92
Burkett's Creek Archaeological Site Hattiesburg	14-Apr-00
East 6 th Street U.S.O. Club	6-Apr-04
Eaton School	16-Jul-08
Hattiesburg Historic Neighborhood District Hattiesburg	17-Sep-80, Boundary Increase 8-Sep-02
Hub City Historic District	29-Aug-80
Hub City Historic District (Boundary Increase)	9-Aug-02
Hub City Historic District (Boundary Increase II)	09-Nov-12
Meador Homestead	5-Nov-10
New York Hotel Fruitland Park	8-Apr-99
North Main Street Historic District Hattiesburg	16-Apr-93
Oaks Historic District Hattiesburg	4-Mar-93
Old Hattiesburg High School Hattiesburg	29-May-87

**HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019**
EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED

Parkhaven Historic District Hattiesburg	9-Aug-02
Saenger Theater Hattiesburg	29-May-79
Tall Pines Hattiesburg	16-Oct-80
U.S. District Courthouse Hattiesburg	18-Sep-73
U.S. Post Office (MS Post Offices 1931-31 TR) (F) Hattiesburg	21-Apr-83
University of Southern Mississippi District	10-Mar-2010

Source: MS Department of Archives and History, 2008. Updated August 2013.

Description of Individual Hazards

The following are hazards that were evaluated by the Hazard Mitigation Plan:

- Dams
- Drought and Extreme Heat
- Earthquakes
- Floods and Flash Flooding
- Hail
- Hazardous Material Accidents
- Hurricanes, Tropical Storms and High Winds
- Power Failure
- Terrorism
- Thunderstorms and Lightning
- Tornados and Funnel Clouds
- Transportation Incident/Accidents
- Urban and Wildfires
- Winter Storms

Due to the geographical location and the history of Forrest County, the following hazards were not included in the Hazard Mitigation Plan:

- Coastal Erosion
- Expansive Soils
- Land Slides and Land Subsidence
- Snow Avalanches
- Tsunami Events
- Volcanoes

HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019
EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED

Historical Occurrence

Since 1957, Forrest County has experienced 323 hazardous events from floods and flash flooding; hail; hurricanes, tropical storms and high winds; thunderstorms and lightning; tornados and funnel clouds with a total of \$6.3 billion in damages. Table 3 –3, Summary of Hazard Historical Occurrence Since 1957 shows these major hazards that have affected Forrest County.

Table 3 –3, Summary of Hazard Historical Occurrence Since 1957

Hazard	Number of Occurrences	Amount of Damage
Floods and Flash Flooding	97	40,318,000
Hail	146	5,808,000
Hurricanes, Tropical Storms and High Winds	18	5,908,000,000
Thunderstorms and Lighting	298	4,090,000
Tornados and Funnel Clouds	33	33,140,000

Source: NOAA, 2012. Updated August 2013.

Dams

Dam failure is the uncontrolled release of impounded water resulting in downstream flooding. There have been no records that indicate a dam failure in the Forrest County area in recent years. In 1983 Forrest County, and particularly the City of Hattiesburg, experienced a 500-year (flash) flood that resulted in the failure of a dam just outside the city limits in Lamar County that impacted Hattiesburg. No deaths resulted in this failure, but the loss of property was major. Refer to Table 3-4 shows high hazard dams that are located in our planning area.

**HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019**

**EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED**

Table 3-4, High Hazard Dams (Source: Emergency Management District, 2006.)

Drought and Extreme Heat

Drought is a prolonged period with no rain, particularly during the planting and growing season in agricultural areas. Droughts can also affect urban areas particularly those that depend on reservoirs for their water. Over the last 25 years Forrest County has experienced several droughts that have resulted in crop damage and low water tables.

Extreme heat is unusually persistent dry weather that continues enough to cause serious problems such as crop damage and/ or water supply shortages. Droughts are normally accompanied by heat waves, which are periods of excessive heat often combined with excessive humidity. This hazard can result in human illnesses and even death as a result of the heat. Mississippi has experienced eight major droughts over the last 60 years. These drought events, which have affected Forrest County and the entire state include:

1940 - 1944

- Affected the entire state
- Resulted in stream flow deficits ranging from 15 to 25 years in the southern portion of the state

Jurisdiction	Name	Area	Contact
Hattiesburg	Lake Sehoy	Off Classic Drive	University of Southern Mississippi
Hattiesburg	Larid's Lake	Oak Grove Road	Lakeshore Homeowners Association
Petal	Trailwood Lake	Trailwood Subdivision	Truman Roberts
Forrest County	Lynn Cartlidge Lake	Longleaf Subdivision	Lynn Cartlidge
Petal	C.E.R. Investments, Inc. Dam	Tropical Gardens	C.E.R. Investments, Inc.
Hattiesburg	40th Place Lake	South 40 th Ave.	David Bomboy
Hattiesburg	Priest's Lake	Off of Veterans Memorial Drive	Timberton Subdivision
Forrest County	Geiger Lake	Johnson State Park	State of Mississippi
Forrest County	Ed Turner Lake	Off of Richburg Road	Ed Turner
Forrest County	Girl Scout Lake	Camp Itta Kana Road	Gulf Pines Girls Scouts
Hattiesburg	Hattiesburg Lagoon	Off of East Hardy	City of Hattiesburg
Forrest County	Elks Lake	Off of Elks Lake Road	Elks Club
Forrest County	Sportsman Club Lake	Sportsman Lake Road	Not available

INCLUDING FORREST COUNTY, CITY OF HATTIESBURG, CITY OF PETAL
WITH THE EMERGENCY MANAGEMENT DISTRICT

HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019
EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED

- Stream flow deficits were determined to have recurrence intervals exceeding 50 years in the northern portion of the state

1951 - 1957

- Affected all except the extreme southern portion of the state
- Resulted in minimum stream flows and the beginning of substantial irrigation projects throughout the state.
- Resulted in increase in the state's production of wells to a peak of around 450 per year in 1955.

1962 - 1971

- Affected the entire state
- Resulted in severe drought conditions in a large portion of the state
- Stream flows receded to minimum discharge levels

1980 - 1982

- Record high temperatures were blamed for approximately 135 deaths across the state
- Rainfall deficiencies had a devastating effect on crop production

1983

- Covered the entire state
- Resulted in eleven heat related deaths
- Fifty-two counties were declared disaster areas

1995

- Affected the entire state
- Fifty counties declared disaster areas

1999

- From March 1, 1999 through November 18, 1999, the state experienced extreme drought conditions and excessive heat
- 81 of Mississippi's 82 counties received some form of disaster designation. Hancock county was the only county ineligible for assistance

2010

- Excessive heat from August 1, 2010 until August 4, 2010.
- 47 of Mississippi's 82 counties were affected by this event.
- Resulted in three fatalities in the affected counties.

Earthquakes

An earthquake is the sudden motion or trembling of the ground produced by abrupt displacement of rock masses, usually within the upper 10 to 20 miles of the earth. An earthquake in Forrest County is a rare occurrence. Most activity has been from aftershocks from distant quakes with no record of epicenters within the county. The most severe earthquake in the U.S. history was on the New Madrid Fault in mid-December 1811, which leveled every building within a 50,000-sq. mi. area from its epicenter of New Madrid, Missouri. The Mississippi River tossed from its banks and onto the hillsides, which swept away entire forests. The quake, actually a series of 2,000 tremors lasting more than three months, was felt throughout the lower half of the continent including south Mississippi. The four shocks that occurred were strong enough to move northern Mississippi at damaging intensities and were felt throughout the state. The Mississippi River ran backwards for three days filling what is known as Reel Foot Lake in Tennessee. Map 3 – 17, Area Earthquake Probability is attached for review. The information in the map was computed from the source model of the 2008 USGS-National Seismic Hazard Mapping Project (NSHMP) update.

Appendix G, Earthquake Occurrence in Mississippi shows earthquakes that have occurred in Mississippi since 1853. The majority of these earthquakes have occurred in Clarke County, in the delta region, and along the coastal area.

Floods and Flash Flooding

Floods and flash flooding is a general and temporary condition of partial or complete inundation of normally dry land from the following: (a) overflow of inland waterways; (b) unusual or rapid accumulation of runoff of surface waters; (c) mudslides/mudflows caused by accumulation of water; and (d) a situation in which rainfall is so intense and severe and runoff so rapid that it precludes recording and relating it to stream stages and other information in time to forecast a flood condition.

Flood producing storms may occur any month of the year; however, they are more prevalent during the winter and spring months. Past records show that floods have occurred in the Forrest County area during the months of December, January, February, March, April, and May. Hurricane related flooding would most likely occur from June 1 through November 30, the recognized hurricane season. Table 3 – 5, Flood Occurrence shows different floods that occurred in the jurisdictions by year, feet, deaths, injuries, and total cost of property damage.

Table 3 – 5, Flood Occurrence

**HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019**

EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW

NEW FMP COMMITTEE GOALS HIGHLIGHTED

Jurisdiction	Year	Number of Feet	Number of Deaths	Amount of Property Damage
Forrest	1961	31.53	0	n/a
Hattiesburg	1974	34.03	0	2,600,000
Hattiesburg	1980	29.53	0	1,300,000
Hattiesburg	1983	29.19	3	32,000,000
Hattiesburg	1987	24.85	0	n/a
Hattiesburg	1991	22.44	0	n/a
Hattiesburg	1993	n/a	0	n/a
Hattiesburg	1993	21.17	0	500,000
Hattiesburg	1994	22.37	0	n/a
Hattiesburg	1995	n/a	0	20,000
Forrest	1997*	21.84	0	n/a
Hattiesburg	1998*	n/a	0	500,000
Hattiesburg	1998	21.34	0	50,000
Forrest	1999*	n/a	1	500,000
Forrest	1999*	n/a	0	n/a
Hattiesburg	2001	n/a	0	n/a
Forrest	2001	n/a	0	n/a
Hattiesburg	2001	n/a	0	n/a
Forrest	2001	25.13	0	n/a
Forrest	2001	n/a	0	n/a
Forrest	2001	n/a	0	6,000
Petal	2001	n/a	0	25,000
Hattiesburg	2001	n/a	0	100,000
Forrest	2001	n/a	0	n/a
Hattiesburg	2001	n/a	0	n/a
Petal	2002	n/a	0	1,000
Hattiesburg	2003	n/a	0	30,000
Hattiesburg	2003	n/a	0	1,000
Forrest	2003*	21.3	0	n/a
Forrest	2003	n/a	0	10,000
Hattiesburg	2003	n/a	0	20,000
Hattiesburg	2004	n/a	0	45,000
Hattiesburg	2004	n/a	0	300,000
Hattiesburg	2004	n/a	0	2,000
Hattiesburg	2004	n/a	0	n/a
Forrest	2005*	n/a	0	40,000
Forrest	2005*	n/a	0	100,000
Forrest	2005*	n/a	0	300,000
Hattiesburg	2008	n/a	0	600,000
Forrest	2009	n/a	0	200,000
Forrest	2009	n/a	0	50,000
Forrest	2009	n/a	0	400,000

INCLUDING FORREST COUNTY, CITY OF HATTIESBURG, CITY OF PETAL
WITH THE EMERGENCY MANAGEMENT DISTRICT

**HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019**

**EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED**

Forrest	2009	n/a	0	200,000
Forrest	2009	n/a	0	15,000
Hattiesburg	2009	n/a	0	2,000
Forrest	2009	n/a	0	5,000
Forrest	2009	n/a	0	10,000
Hattiesburg	2010	n/a	0	25,000
Petal	2010	n/a	0	25,000
Hattiesburg	2011	n/a	0	1,000
Forrest	2011	n/a	0	250,000
Forrest	2011	n/a	0	20,000
Forrest	2011	n/a	0	5,000
Forrest	2011	n/a	0	10,000
Forrest	2011	n/a	0	50,000
Forrest	2012	n/a	0	5,000
Hattiesburg	2012	n/a	0	n/a
Hattiesburg	2012	n/a	0	50,000
Forrest	2012	n/a	0	50,000
Hattiesburg	2012	n/a	0	6,000
Hattiesburg	2012	n/a	0	20,000
Forrest	2013	n/a	0	100,000
Forrest	2013	n/a	0	n/a
Total				40,549,000

Source: NOAA and the Emergency Management District, 2012 and 2013.

Notes: N/a - not available

* - flash flooding

Hail

Hailstorms develop from thunderstorms. Hailstorms occur in most cities and towns across the United States. This form of severe weather is more prevalent in the Midwestern states. Hailstorms cause almost \$1 billion dollars of property and crop damage each year. Hailstorms are formed in the inside of a thunderstorm that contains strong updrafts of warm air and downdrafts of cold air. These droplets are then carried back and forth between warm and cold air adding another layer of ice each time. After the addition of many layers of ice, it falls to the ground as hail. The size of hail is difficult to estimate. NOAA provides the following chart to give an estimate of size:

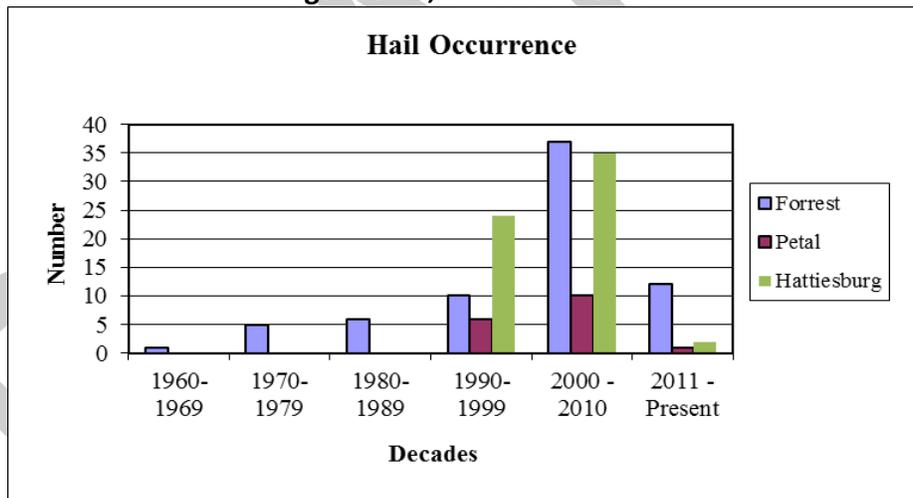
- Pea = 1/4 inch diameter
- Marble/mothball = 1/2 inch diameter
- Dime/Penny = 3/4 inch diameter - hail penny size or larger is considered severe
- Nickel = 7/8 inch
- Quarter = 1 inch
- Ping-Pong Ball = 1 1/2 inch
- Golf Ball = 1 3/4 inches

HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019
EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED

- Tennis Ball = 2 1/2 inches
- Baseball = 2 3/4 inches
- Tea cup = 3 inches
- Grapefruit = 4 inches
- Softball = 4 1/2 inches

Figure 3-2, Hail Occurrence, shows the amount of hail damage for participating jurisdictions. There have been 105 occurrences since 1960 with estimated amount of damage at 5.95 million dollars. There is no method to accurately determine if an upcoming thunderstorm has the probability of producing hail. Weather experts use radar to determine hail in storms based off its reflection. Forrest County and other participating jurisdictions will address future hail occurrences by utilizing the local media, NOAA radios, SKYWARN Weather Spotters and information from local emergency officials. Appendix H: Hail History 1965 – Present shows the detail history of this hazard.

Figure 3 - 2, Hail Occurrence



Source: NOAA, 2006. Updated with 2013 data.

Hazardous Material Accidents

Hazardous materials (fixed facility) are the uncontrolled release of materials from a fixed site. Hazardous materials transportation is the uncontrolled release of hazardous materials during transport. Hazardous materials incidents in Forrest County, the City of Hattiesburg and the City of Petal areas have increased considerably in the last 10 years with the population growth. Incidents of varying severity have occurred in all participating jurisdictions, involving both fixed facility and transportation. Most of the incidents have been restricted to small areas and did not affect large segments of the

public or property, however, some incidents have occurred which affected several thousand residents and were responsible for moderate property damage. Radiological transportation incident is any incident that involves a transportation vehicle or shipment, containing radioactive materials. There have been no reports of radiological transportation incidents in Forrest County or participating jurisdictions.

Hurricanes, Tropical Storms and High Winds

Hurricanes are tropical cyclones, formed in the atmosphere over warm ocean areas, in which wind speeds reach 74 miles per hour or more and blow in a large spiral around a relatively calm center or "eye." Circulation is counterclockwise in the Northern Hemisphere and clockwise in the Southern Hemisphere.

In the last 100 years some 21 Hurricanes have either hit or affected the Mississippi Gulf Coast and adjacent inland counties. The worst and most recent hurricane to strike Mississippi was Katrina in 2005. A total of 238 people from Mississippi were killed from the effects of the storm with 1,844 total dead from Katrina. Forrest County and the cities of Hattiesburg and Petal experienced major timber and property damage from weather conditions as a result of hurricanes in the Gulf. These effects have included wind damage, tornado activity, lightening and flooding. In the hurricane of 1915, Forrest County experienced extensive flooding. Hurricane Camille in 1969 created great land damage, while Hurricane Frederic in 1979 spawned hundreds of tornadoes. Hurricane Andrew produced tornadic weather, while Hurricane Erin caused flash flooding from feeder bands coming on shore the day after the hurricane made landfall. Tables 3 - 6 and 3 - 7 show the category of the hurricanes, the magnitude by jurisdictions, dates, death, and total cost of property damages.

Table 3 – 6, Hurricanes, Tropical Storms and High Winds Occurrence

**HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019**

EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW

NEW FMP COMMITTEE GOALS HIGHLIGHTED

Jurisdiction	Name	Date	Magnitude (category)	Number of Deaths	Number of Injuries	Amount of Property Damage	Amount of Crop Damage
Forrest	Camille	8/17/1969	5	n/a	n/a	n/a	n/a
Forrest	Frederic	9/13/1979	3	n/a	n/a	n/a	n/a
Forrest	Elena	9/2/1985	3	n/a	n/a	n/a	n/a
Forrest	Georges	8/27/1998	2	0	0	2,800,000	n/a
Forrest	High Winds	12/16/2000	0 kts.	0	0	38,000	n/a
Forrest	T.S. Isidore	9/26/2002	50 mph.	0	0	500,000	n/a
Forrest	T.S. Bill	6/30/2003	n/a	0	0	100,000	n/a
Forrest	T.S. Bill	7/1/2003	n/a	0	0	100,000	n/a
Forrest	Ivan	9/16/2004	n/a	1	0	1,500,000	n/a
Forrest	T.S. Cindy	7/6/2005	n/a	0	0	150,000	n/a
Forrest	Dennis	7/10/2005	n/a	0	0	2,600,000	2,200,000
Forrest	Katrina	8/29/2005	4	8	104	5,900,000,000	1,500,000,000
Hattiesburg	High Winds	3/9/2006	n/a	0	0	1,000	n/a
Forrest	T.S. Fay	8/24/2008	n/a	0	0	n/a	n/a
Forrest	Gustav	9/2/2008	2	0	0	n/a	n/a
Forrest	T.S. Ida	11/10/2009	n/a	0	0	1,000	n/a
Forrest	T.S. Bonnie	7/23/2010	n/a	0	0	n/a	n/a
Forrest	T.S. Lee	9/5/2011	n/a	0	0	n/a	n/a
Forrest	High Winds	9/4/2011	35 kts.	0	0	3,000	n/a
Forrest	High Winds	9/5/2011	39 kts.	0	0	4,000	n/a
Forrest	Isaac	8/29/12	1	0	0	200,000	n/a
TOTAL				9	104	5,907,996,000	1,502,200,000

Source: NOAA, 2012. Updated 2013. Note: n/a - not available

Power Failure

Power failure is any interruption or loss of electrical service due to disruption of power generation or transmission caused by accident, sabotage, natural hazards, equipment failure, or fuel shortage. Such interruptions typically last for periods of a few seconds to several days. A "significant" power failure is defined as any incident that would require the involvement of the local Emergency Management organization to coordinate the distribution for the provision of food, water, ice, heating, etc. All of the participating jurisdictions have experienced power failures to some degree in past years. Tornadoes, winter storms, severe thunderstorms and hurricanes have all produced conditions that resulted in massive power failures. Hurricanes Camille, Frederic and Katrina all produced property and tree damage that caused extended periods of electrical outages.

Thunderstorms and Lightning

Thunderstorms can occur anywhere in the world and at any time of the day. All thunderstorms produce lightning and thunder. Some have the potential to produce damaging straight-line winds, large hail, heavy rain, flooding, and tornadoes. A thunderstorm is classified as **severe** when it contains one or more of the following phenomena: Hail 3/4" or greater; Winds gusting in excess of 50 knots (57.5 mph); Tornado(s).

Three basic ingredients are needed to make a thunderstorm. The basic fuel is moisture (water vapor) in the lowest levels of the atmosphere. The air above the lowest level has to cool off rapidly with height, so that 2-3 miles above the ground, it is very cold. Finally, something in the atmosphere must push that moist air from near the ground up to where the air around it is cold. This "something" could be a cold front or the boundary between where the cold air from one thunderstorm meets the air outside of the storm (called an outflow boundary) or anything else that forces the air at the ground together. When that happens the moist air is pushed up. It cools off and after a while, some of the water vapor turns into liquid drops (that are seen as clouds). That warms up the rest of the air in the blob so that it doesn't cool off as fast as it would if the air were dry. When that blob of air gets to the part of the atmosphere where it is very cold, it will be warmer and less dense than the air around it. Since it is less dense, it will start to rise faster without being pushed, just like a balloon filled with helium does. Then more water vapor turns into liquid in the blob, and the blob warms up more and rises even faster until all of water vapor is gone and the blob eventually reaches a part of the atmosphere where it isn't warmer than the environment (typically 5-10 miles).

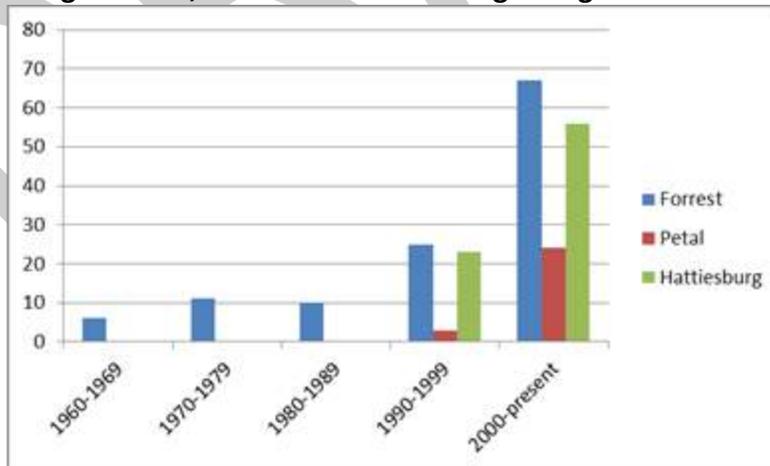
HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019
EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED
Table 3 – 7, Saffir – Simpson Hurricane Scale

Category	Winds MPH	Effects
1	74-95	Very dangerous winds will produce some damage. Well-constructed frame homes could have damage to roof, shingles, vinyl siding and gutters. Large branches of trees will snap and shallowly rooted trees may be toppled. Damage to Power lines and poles likely which result in outages.
2	96-110	Well-constructed frame homes could sustain major roof and siding damage. Other damage includes but not limited to: trees uprooted which will cause road blockage and near total power loss
3	111-129	Devastating damage will occur and includes the following: well-built framed homes may incur damage or removal of roof decking and gable ends; trees will be snapped or uprooted; blocking numerous roads; electricity and water will be unavailable for several days to weeks after the storm passes.
4	130-156	Catastrophic damage will occur. Effects include: severe damage to homes; trees will be snapped and uprooted and power outages that can last up to a month.
5	>157	Catastrophic damage will occur. Effects include: destroyed homes; fallen trees and power poles and uninhabitable areas for weeks to months.

Source: NOAA, 2012.

Figure 3 – 3, Thunderstorm and Lightning Occurrence shows the number of thunderstorms and lightning in Forrest County since the 1960's. Annually, lightning strikes 400 people in the United States killing approximately 70 people and leaving many with permanent neurological disabilities. The last two decades have seen a significant rise in the number of these storms in Forrest County. Appendix F: Thunderstorm and Lightning History 1963 – Present shows the detail history of this hazard.

Figure 3 – 3, Thunderstorms and Lightning Occurrence



Source: NOAA, 2012. (Updated with 2013 Data.)

**HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019**

**EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED**

Tornados and Funnel Clouds

A tornado is an atmospheric storm, generally of short duration, formed by winds rotating at very high speeds, usually in a counterclockwise direction. The vortex, up to several hundred yards wide, is visible to the observer as a whirlpool-like column of winds rotating about a hollow cavity or funnel. Winds have been estimated in excess of 300 miles per hour. Tornado occurrence in South Mississippi is recorded for virtually every month of the year since record keeping began. Many sightings are reported every year. Confirmations are sometime difficult; however, enough sightings have been documented to know that tornadoes are a frequent occurrence in the Forrest County area. Refer to Tables 3-8 , 3-9 and 3-10 for the magnitude based on the Fujita scale and the frequency and amount of damage since 1957.

Table 3 – 8, Tornados and Funnel Cloud Occurrence

Jurisdiction	Date	Magnitude	Number of Deaths	Injuries	Amount of Property Damage	Amount of Crop Damage
Forrest	5/2/1957	F1	0	0	n/a	n/a
Forrest	2/20/1961	F1	0	0	25,000	n/a
Forrest	12/12/1965	F1	0	0	n/a	n/a
Forrest	7/20/1966	F1	0	0	250,000	n/a
<u>Forrest</u>	5/24/1973	F1	0	0	3,000	n/a
Forrest	5/7/1975	F1	0	0	3,000	n/a
<u>Forrest</u>	5/7/1975	F2	0	0	250,000	n/a
<u>Forrest*</u>	3/28/1977	F2	0	0	250,000	n/a
<u>Forrest*</u>	3/28/1977	F2	0	0	25,000	n/a
<u>Forrest</u>	5/7/1982	F3	0	1	250,000	n/a
<u>Forrest</u>	12/11/1983	F1	0	0	250,000	n/a
Forrest	5/24/1992	F0	0	0	25,000	n/a
Forrest	3/9/1994	F1	0	0	50,000	n/a
<u>Forrest/Hattiesburg</u>	3/7/1995	F0	0	0	5,000	n/a
Forrest/Lumberton	3/7/1995	F0	0	0	2,000	n/a
Forrest/Carnes	2/19/1996	F1	0	0	100,000	n/a
Forrest/Carnes	4/17/1998	F0	0	0	5,000	n/a
Forrest/Hattiesburg	6/5/1998	F1	0	0	20,000	n/a

**HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019**

**EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED**

Forrest/Hattiesburg	4/14/1999	F0	0	0	n/a	n/a
Forrest/Hattiesburg	3/12/2001	F1	0	5	6,000,000	n/a
Forrest/Hattiesburg	1/7/2005	F1	0	0	125,000	n/a
Hattiesburg **	4/6/2005	n/a	0	0	n/a	n/a
Petal **	4/6/2005	n/a	0	0	n/a	n/a
Forrest/Hattiesburg	8/29/2005	F1	0	0	2,000	15,000
Hattiesburg **	3/20/2006	n/a	0	0	n/a	n/a
Forrest**	11/21/2007	n/a	0	0	0	n/a
Forrest	3/3/2008	F1	0	14	1,500,000	0
Forrest	5/15/2008	F1	0	0	700,000	500,000
Forrest	5/15/2008	F1	0	0	80,000	0
Forrest	9/4/2011	F0	0	0	1,000	0
Forrest	3/2/2012	F1	0	0	15,000	0
Forrest	3/21/2012	F0	0	0	20,000	0
Forrest	12/25/2012	F2	0	4	200,000	0
Forrest	2/10/2013	F3	0	63	25,000	0
TOTAL			0	87	10,181,000	515,000

Source: NOAA, 2006. Updated, 2013.

Notes: N/a - not available

* Storm occurring on same day but at different times and varying paths.

** Funnel cloud only.

Table 3 – 9, Fujita Tornado Damage Scale

Scale	Wind Estimate (mph)	Damage
F0	<73	Light Damage. Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; signboards damaged.
F1	73-112	Moderate Damage. Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos blown off roads.
F2	113-157	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars overturned; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.

HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019
EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED

F3	158-206	Severe damage. Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off ground and thrown.
F4	207-260	Devastating damage. Well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown and large missiles generated.
F5	261-318	Incredible damage. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 meters (109 yds); trees debarked; incredible phenomena will occur.

Source: NOAA, 2006

Table 3 –10, Enhanced Fujita (EF) Tornado Damage Scale

EF Scale	Wind Estimate
EF0	65-85
EF1	86-110
EF2	111-135
EF3	136-165
EF4	166-200
EF5	Over 200

Source: NOAA, 2013

Transportation Incident/Accidents

Transportation Incident is an incident involving passenger air, ground or rail travel resulting in death or injury. Incidents involving transportation accidents in the participating jurisdictions have been enough in the past to warrant more than casual concern on the part of the emergency planner. The accidents that have occurred range anywhere from train derailments to auto accidents. Some of these did involve a release of a hazardous substance and required special response. Many of these incidents occurred outside cities and away from population concentrations, however, as the urbanized areas grow, the probability for transportation incidents increases. Numerous accidents involving transport trucks have been reported inside the city limits of Hattiesburg as well in the county areas, especially on I-59 and U.S. 49.

Urban and Wildfires

Urban fire is uncontrolled burnings in residential, commercial, industrial, institutional, or other properties in developed areas. Each participating jurisdiction has had their share of fire incidents. Residential and commercial fires have been the major areas of fire suppression. However industrial fires have occurred in both areas and through mutual

HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019
EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED

aid these incidents have been controlled to the best of the capabilities of the fire departments.

Wildfire is any instance of uncontrolled burning in grasslands, brush or woodlands. The Forrest County area has experienced wildfire in the past. Due to the mass of forestland throughout south Mississippi, wildfire is not a stranger to this area. Forrest County has experienced wildfire due to neglect and through the work of arson. Volunteer fire departments in the county have responded to wooded fires for numerous years.

Before Hurricane Katrina, wildfires would typically damage ten to fifty acres of land. Today, due to the tremendous amount of added fuel on the ground, the amount of land damaged could easily be fifty to two hundred acres. The Mississippi Forestry Commission, Emergency Management and the volunteer fire departments are working with the U. S. Forest Service to maintain control of this problem by implementing burn bans when necessary.

Winter Storms

Winter Storm includes ice storm, blizzards, and extreme cold. The National Weather Service characterizes blizzards as being combinations of winds in excess of 35 miles per hour with considerable falling or blowing snow which frequently reduces visibility to 0.25 miles or less.

The frequency of winter storms, in the Forrest County area, which result in problems to the community, is about once every 4 to 5 years. These storms have ranged in type and severity, from frozen rain and sleet, to snow and sub-freezing temperatures. The months of December, January, February, and March have in the past proved to be the most likely times of concern, however, an early April winter storm affected all participating jurisdictions in 1987. These storms are generally about 2 to 4 days in duration.

HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019
EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED

Magnitude and Severity of Impact

The magnitude and severity of the impact of the hazards affecting Forrest County and each participating jurisdiction were calculated using a ranking system. This assessment utilized information provided by each jurisdiction, data gathered by NOAA and associated agencies along with historical information collected from various sources. A description of the vulnerability assessment along with the scale for each is as follows:

Four Factors:

- 1. Percent of geographic area affected by hazard.**
N/A=0; 0-49 percent of area affected=2; 50-74 percent of affected area=4 and 75 percent and greater=6
- 2. Amount of Property Damage.**
No damage=0; Few properties damaged=2; Moderate amount of damage=4 and Many Properties damaged=6
- 3. Environmental and Health Related Damage**
No damage=0; Little damage with few injuries=2; Moderate damage that will require short term recovery efforts=4; Major damage that will require long term recovery and numerous fatalities and injuries=6
- 4. Economic Impact**
No cost=0; Little Cost=2; Moderate Cost=4; Major Cost=6

Based upon the scores of each factor listed above, the total was then multiplied by a probability of future occurrence. The probability of future occurrence scale is as follows:

Unknown or rare=0; Little or small chance of occurrence=2; Moderate amount of occurrences=4; Large amount of probable occurrences=6.

The formula used to determine level of risk used was:

VULNERABILITY X PROBABILITY OF FUTURE OCCURENCE=LEVEL OR RISK

The level of risk for the jurisdiction fell within one of three categories. The categories per area can be found in Appendix E and in Table 3-10. The overall rating of risk can be found below:

- **0-20: Low Risk**
There is minimal risk to the jurisdiction.
- **21-49: Moderate Risk**
There is a moderate risk to the jurisdiction and some damage to property will occur along with few injuries.
- **50 and above: Major Risk**

**HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019
EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED**

There is a high risk to the jurisdiction and a high probability of severe damage to property and high number of loss lives.

Table 3 – 11, Risk Assessment by Jurisdiction

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**HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019**

**EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED**

Hazard	City of Hattiesburg	City of Petal	Forrest County
Dams	Major	Low	Low
Drought and Extreme Heat	Major	Moderate	Major
Earthquakes	Low	Low	Low
Floods and Flash Flooding	Major	Major	Major
Hail	Major	Major	Major
Hazardous Material Accidents	Major	Major	Major
Hurricanes, Tropical Storms, and High Winds	Major	Major	Major
Power Failure	Major	Moderate	Major
Terrorism	Major	Major	Major
Thunderstorms and Lightning	Major	Major	Major
Tornados and Funnel Clouds	Major	Major	Major
Transportation Incident/Accidents	Major	Major	Major
Urban and Wildfires	Major	Moderate	Major
Winter Storms	Low	Low	Low
Expansive Soils	Low	Low	Low
Land Slides and land substance	Low	Low	Low
Snow Avalanches	Low	Low	Low
Tsunami Events	Low	Low	Low
Volcanoes	Low	Low	Low

Source: Vulnerability Assessments of Hazard Mitigation Council, 2013.

Dams

While most dam owners have assumed responsibility for the safety of their structures with appropriate design, construction and maintenance, some have failed to provide and maintain for safe dams. A safe dam can become very susceptible during an earthquake or heavy rains that may exceed its design specifications resulting in the failure of the dam.

There are no recorded incidents of dam failure or breach of dams in Forrest County. In 1983 however, a dam in neighboring Lamar County failed causing a significant amount of damages in the City of Hattiesburg. Beginning in 2006, owners of lakes are required to have an Emergency Action Plan on file with the State of Mississippi and local emergency management office.

The high hazard designation means that in the event of a dam failure, there is possibility of loss of life and/or major property damage downstream as a result of the failure. In 1994, according to the State of Mississippi Inventory of High Hazard Dams, published by the Mississippi Department of Environmental Quality, Office of Land and Water Resources, Forrest County including the City of Hattiesburg within Lamar County had only one high hazard dam. Due to the population growth in Forrest County, as of 2006 Forrest County has thirteen high hazard dams as reflected in Table 3 - 4, High Hazard Dams.

Drought and Extreme Heat

Due to the agricultural and forestry industry in both Forrest County, even a minor drought could affect the products of those industries. Since droughts are often widespread the severity of a major drought could have a devastating economic impact on the citizens in the participating jurisdictions. The likelihood of a drought in south Mississippi is a possibility, but due to the proximity of Forrest County to the Gulf of Mexico and the moisture that exists, drought is not a frequent occurrence.

Earthquakes

An earthquake in Forrest County, City of Hattiesburg and the City of Petal would be limited to an estimated intensity of V on the Modified Mercalli Scale (4.0 - 4.9 on the Richter Scale).

Forrest County, the City of Hattiesburg and the City of Petal could be affected by earth tremors from the Arkansas River Fault Zone to the North and the New Madrid Fault zone to the West.

Floods and Flash Flooding

Flooding to some extent occurs in the Forrest County area virtually every year. Major floods have occurred approximately 14 times in less than 100 years. Floods are rated in severity by the rate of occurrence. A 20-year flood would be very minor and produce no appreciable damage. A 100-year flood produces major damage with evacuation needed. A 500-year flood produces major damage and evacuation is widespread.

Flooding related to river overflow is expected along major river drainage systems. Flash flooding of lesser drainage systems is also common as a result of heavy rains. Both types of flooding have typically occurred yearly and are expected to continue. Table 3 – 5, Flood Occurrence also shows the magnitude of flooding in Forrest County with the amount of property damage and number of deaths.

Hazardous Material Accidents

The impact of a hazardous material accident in this area is usually limited, but the potential exists for widespread life, property, and economic destruction. Interstate 59 and U.S. 49 and Highway 98 are major highways through Forrest County and the City of Hattiesburg for shipments of radioactive and other hazardous materials. Major areas for concern in an incident would be urban areas such as the City of Hattiesburg, or any other city along heavily traveled I-59 or U.S. 49.

Shipments of radioactive and other hazardous materials through the Forrest County area have become an everyday occurrence. With the growth of Hattiesburg and Petal, more and more shipments will be transported through our county.

Most occurrences will result in damage restricted to the incident site, but can involve widespread concern including evacuation, mass care, loss of life, and considerable property damage. Although hazardous materials incidents have occurred, the awareness of business and industry is good.

Hurricanes, Tropical Storms and High Winds

The impact of a hurricane on the community may be nothing more than to create public apprehension or may result in major property damage, injury, or death. Table 3 – 6, Hurricane, Tropical Storms and High Winds Occurrence shows the amount of property damage, number of person injured and number of fatalities.

HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019
EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED

The scope of damage will vary as to the size and intensity of the hurricane. The Safir/Simpson Scale defines hurricane intensity by categories 1 – 5. A detailed description of the scale is located in Table 3 – 7, Saffir – Simpson Hurricane Scale.

The hurricane season for Mississippi lasts from June 1 to November 30, with the most vulnerable months being August and September. The National Hurricane Center can and does release projected landfall points of hurricanes and issue hurricane watches and warning for areas that are threatened by these storms.

Power Failure

Power failure in the Forrest County area would hit the hardest in urban areas such as the City of Hattiesburg. Hospitals and emergency response agencies should have back up power for times of power failures. Power failure for any extended time could cause emergency situations throughout the County and the cities. Every severe weather system that affects Forrest County has a potential for extensive power outages. Transportation and fire incidents can also affect area electrical power.

Tornados and Funnel Clouds

Vulnerability to a tornado is nothing but high in any area prone to their occurrence. The impact may be as light as a few trees uprooted to widespread devastation of a catastrophic nature. This variability does affect the vulnerability. Table 3 – 8, Tornados and Funnel Cloud Occurrence shows the amount of crop and property damage and injured.

Tornado strength and the time a tornado stays in contact with the ground are both variables. Even the smaller magnitude tornados are damaging. In 1983, 21 tornados were confirmed with damage in Mississippi. Of these 21, nine were within 100 miles of the Forrest County area and many were sighted. According to national figures, south Mississippi has confirmed over 100 tornados in the last 50 years. Tornado probabilities change from month to month. The peak months in South Mississippi are from February through June, however tornados can and do occur in any month of the year. The last major tornado hit Forrest County on February 10, 2013. This storm event caused 25 million dollars in damage to properties within the County, City of Hattiesburg and the City of Petal. Also, this storm attributed to 63 injuries and rated as an EF3 storm. Information related to this storm and previous ones can be found in Table 3-8.

Transportation Incident/Accidents

The intensity of impact will generally be limited in nature to the incident zone but can involve re-routing of traffic, mobilization of the emergency services, the activation of

HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019
EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED

emergency medical plans, the activation of Emergency Operations Center, evacuation, mass care and temporary shelter. Life, property, and the economy could be at risk.

The scope of damage will generally be limited to the incident site, but can include widespread concern including evacuation, mass care, and considerable property damage. A plane crash may create the need for fire fighting, law enforcement, and medical services. A highway accident involving busses or carriers of hazardous cargo can involve substantial rescue, fire fighting, extraction and evacuation operations. A railway accident is usually limited in fatalities but can produce considerable population hazards where the cargo is flammable, toxic, or explosive when it occurs in or near business or residential area. If any of these accidents were to occur within a heavily populated area, the threat potential would rise to an alarming level.

As the participating jurisdictions continue to experience growth, transportation corridors will be enhanced and constructed to accommodate the growth of the region. This will result in an increased probability of transportation accidents. Not only will highways/roads and air-related modes be analyzed for future incidents—rail will also be incorporated. There are four main rail lines that run through Forrest County and are as follows: Illinois Central Railroad, Mississippi Central Railroad, Southern Railway and New Orleans/Northeastern Railroad. All of the aforementioned rails are utilized to carry items that range from coal to hazardous materials. Along with the materials being transported through communities of large amount of populations—there are switchyards that are in close proximity to major employment centers. Therefore, the risks of transportation incidents are high which makes the study area very vulnerable.

Urban and Wildfires

Urban fire can be devastating on a community or city both economically and environmentally. Residential fires are always a number one killer when looking from a life and death perspective. Industrial fire is a cause of loss of life and loss of income for workers and suppliers. The participating jurisdictions have a high vulnerability rate of urban fire damage. Urban fire can become uncontrolled if not properly and promptly addressed. Shelter for families must be set up in some cases and evacuation could be required. Industrial fires often produce hazardous gases and residential areas must be evacuated. Both areas have the potential to experience urban fire at its worst.

Wildfire in Forrest County could cause considerable property damage to timber and to residential areas that are established all over the rural areas of the county. Timber and brush are always good conductors of fire and at certain times of the year, dry conditions warrant close observance for possible wildfires. Lighting strikes, arson, uncontrolled

HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019
EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED

burns by citizens, and carelessness account for many of the wildfires that occur in south Mississippi. Prior to Hurricane Katrina, a wildfire would generally destroy between 20 and 50 acres before the fire could be contained. However, the massive amount of fallen trees from Hurricane Katrina are a fuel for potential wildfire incidents that today would result in between 50 and 200 acres of land lost. This increased hazard threat would also result in the destruction of numerous structures.

Forrest County, the City of Hattiesburg and the City of Petal could experience major property damage and loss of life due to urban and wildfires. Regional agreements are in place to safeguard all communities within the county to ensure the protection of life. These agreements are between municipal fire departments and county volunteer departments.

Winter Storms

Ice storms or a hard freeze following rainfall or snow and/or ice can make bridges and overpasses, streets and roads hazardous. These conditions can cause extensive damage to power lines, heating systems, water systems, sanitation systems, business, industry, schools, people, animals and livestock. The community can be virtually paralyzed in its normal day-to-day activities. Past response to these events has been good. The greatest danger to this area is longevity. The longer an extremely cold system stays over the area, the greater the damage. In the past when ice and/or snow move into this area it has typically been limited to 2 to 4 days of cold at or below freezing temperatures. If an ice/snow storm were to occur with single digit temperatures following and remaining for a week or more, the hardships would severely tax the capability of the community. Severe property damage, interruption of services, interruption of heat sources and possible loss of water supplies could result. The occurrence of severe winter storms is not a regular event. For this reason, little preparation is made for them. The South in general is not equipped to handle major winter storms because of their infrequency. The National Weather Service can usually predict the approach of winter storms to within 24 hours. This prediction allows for some preparation.

Probability of Future Occurrence

Based on the history of hazards in Forrest County, it is probable that the following hazards will continue to affect the County or be a possible threat to the County:

- Dams
- Drought and Extreme Heat
- Earthquakes
- Floods and Flash Flooding
- Hail

**HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019**

**EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED**

- Hazardous Material Accidents
- Hurricanes, Tropical Storms and High Winds
- Power Failure
- Terrorism
- Thunderstorms and Lightning
- Tornados and Funnel Clouds
- Transportation Incident/Accidents
- Urban and Wildfires
- Winter Storms

It is not probable that the following hazards will affect Forrest County due the geographical location and the history of the County:

- Expansive Soils
- Land slides and land subsidence
- Snow Avalanches
- Tsunami Events
- Volcanoes

Table 3 – 11, Summary of Probability of Future Occurrence, shows the total amount of damage by the five major risk hazards within Forrest County. The time frame for these hazards ranges from the submittal of the last plan until currently (May 2007-August 2013). Totals related to damage were obtained from NOAA and major hazard (natural) identification was done by the Hazard Mitigation Council. The numbers below reveal that Forrest County received over \$32 million dollars in damaged due to flash flooding, hail, hurricanes, thunderstorms and tornados. If the same total were to remain constant along with taking into consideration of possibility identified by each jurisdiction---the total amount of damage over a ten-year period would be \$324,035,000. The aforementioned total assumes there will continue to be at least three major flood events a year; at least ten hail events a year; one major tropical storm a year; two major lighting events a year and six major thunderstorm events a year. There have been no major hurricanes to cause damage within the study area since Katrina. However, the worst-case scenario would be one similar to it within the next ten years which would increase the aforementioned total to approximately **\$6,224,035,000**. The amount of damage caused by Katrina was estimated at \$5,900,000,000.

Table 3 - 12, Summary of Probability of Future Occurrence

Hazard	Damage Totals
Floods and Flash Flooding	\$ 2,654,000
Hail	\$ 273,000

HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019
EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED

Hurricanes, Tropical Storms and High Winds	\$ 360,000
Thunderstorms and Lighting	\$ 1,499,000
Tornados and Funnel Clouds	\$ 27,617,500
TOTAL	\$32,403,500

Source: Forrest County Planning Department, May 2013

Summary of Hazard Characteristics

Refer to Appendix E: Vulnerability assessment by Jurisdiction that summarizes the hazard characteristics by locale. This appendix shows the total population of the jurisdiction, factors related to the hazard and overall probability of future occurrence.

Vulnerability

Refer to Appendix E: Vulnerability assessment by Jurisdiction, by Hazard that shows the vulnerability of each respective jurisdiction along with the overall risk factor. Some of the hazards that have the highest risk are floods and flash flooding, tornados, hail, high winds, urban fire and transportation incident/accidents.

Planned Improvements and Vacant/Underutilized Land

According to Table 3 – 1, City of Petal Existing Land Use and Vacant Land Analysis, the total land in urban use is 5,303.48 acres. An additional 5,135.98 acres are currently vacant and available for residential, commercial, or industrial use. Currently, the City of Petal’s total acreage is 10,439.46. The City of Petal has 4,024.56 acres in developed residential uses that represents approximately 75.89% of the developed land in the municipal area. Dividing the population of Petal by the total residential acreage yields a population density of 2.44 persons per net acre.

It should be noted for planning purposes that Neel-Schaffer, Inc, placed the land use data into a geographical information system (GIS) ArcView database that linked land use to each parcel. In some areas there may be a house located on a small portion of a lot and the remaining parcel is undeveloped. In these instances, the entire parcel would be coded residential and this acreage is reflected in Table 3 – 1, City of Petal Existing Land Use and Vacant Land Analysis.

Areas Affected by Identified Hazards

Forrest County, the City of Hattiesburg and the City of Petal are all affected by hazards identified in their vulnerability assessments. Overall, there are 32, 209 structures within the County. Of this total, 15,586 are in the City of Hattiesburg and 4,563 in Petal. The

HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019
EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED

remaining 11,960 are within Forrest County. The type of structure within each jurisdiction ranges from residential, commercial and critical facilities. A list of the critical facilities can be found in Appendix D. The land area and person per square mile for the jurisdictions are as follows: City of Hattiesburg—53.38 and 861.5 persons; City of Petal—16.87 and 619.8 persons and Forrest County—466.31 and 160.7 persons. If those totals are taken into consideration with the one of the four factors (Percent of geographic area affected by hazard) identified by the jurisdiction—one can determine the perceived portions affected. For example, according to data found in Appendix E; the following were identified as major hazards affecting large portions of a particular jurisdiction:

- Forrest County: Drought/Extreme Heat, Hail, Hurricanes, Power Failure, Terrorism, Thunderstorms, Tornados and Transportation.
- City of Petal: Drought/Extreme Heat, Hail, Hurricanes, Tropical Storms, Terrorism, Thunderstorms and Tornados.
- City of Hattiesburg: Drought/Extreme Heat, Hail, Hurricanes, Power Failure, Terrorism, Thunderstorms, Tornados and Transportation.

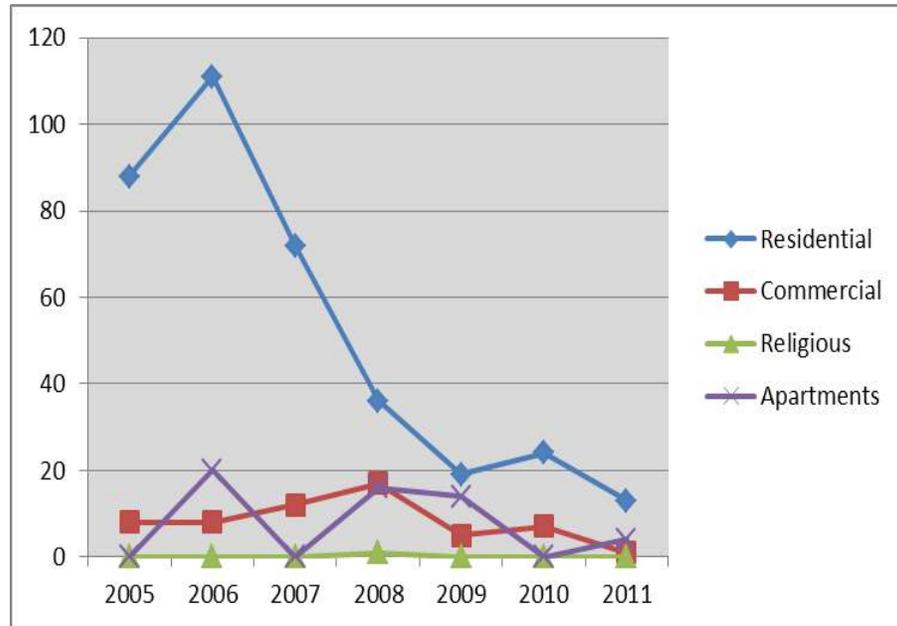
All of the aforementioned identified threats were given a score of 6 by the respective jurisdiction. According to the survey instrument, this score would indicate a 75 percent or greater affected area. In other words, respondents from Petal believe that 12.66 percent of their 16.87 square miles would be affected by the hazard; 41.53 percent of the 53.38 for Hattiesburg and 349.73 of 466.31 for Forrest County.

Analysis of Development Trends

As shown in Figure 3 – 4, City of Petal Building Permit Analysis for New Construction, of the building permits issued for new construction in the last seven years (2005 - 2011), almost 76.26% of the 476 permits issued were for residential structures. Also, of the total development, 12.1 % or 58 were for commercial. Apartment and multi-family development accounted for 11.34% of new development during the period of 2005-2011. An additional 68 permits were issued for the demolition of structures within the City of Petal.

Figure 3 –4, City of Petal Building Permit Analysis for New Construction

**HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019**
EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED

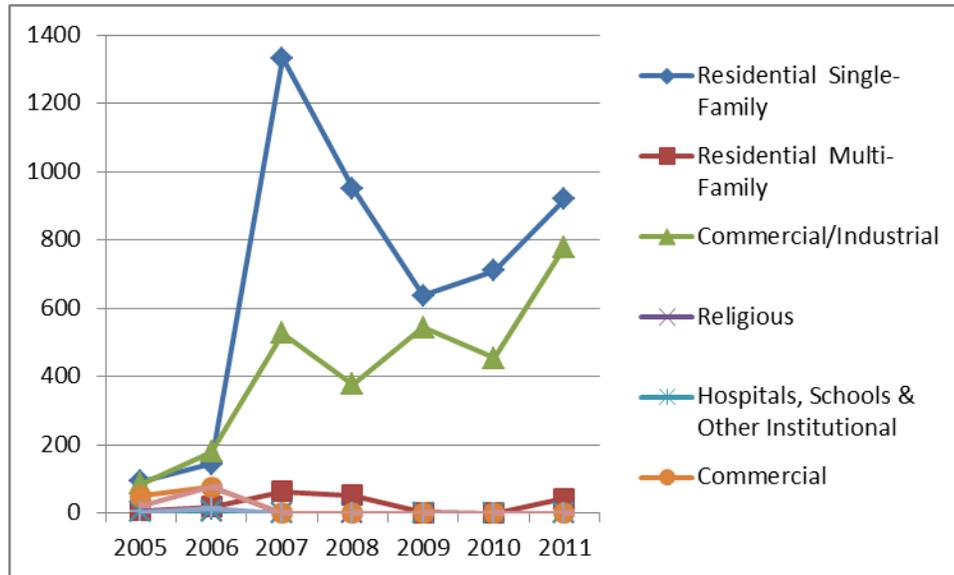


Source: City of Petal Building Department, 2013.

As shown in Figure 3 –5, City of Hattiesburg 7-Year Building Permit Analysis, of the building permits issues in the last seven years (2005 – 2011), 58.44% of the 8,193 permits issued during the time frame were for residential purposes. Commercial permits accounted for 35.99% of the permits.

Figure 3 –5, City of Hattiesburg Building Permit Analysis

**HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019**
EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED



Source: City of Hattiesburg, Department of Urban Development, 2012

Forrest County does not issue building permits, but does issue floodplain permits and certifications, Stormwater permits and track subdivision developments. Over the past several years, approximately 1,869 permits have been issued in the unincorporated area of Forrest County. These development trends are shown in Map 3 – 15, Residential Developments of the different developments within the urbanized area. No new subdivision developments have occurred within the county due to the current economic climate and various other factors.

Summary of Jurisdictional Exposure to Risk by Hazard

Of the fourteen hazards that can affect each participating jurisdiction, the most damaging to date have been Floods/Flash Flooding, Hail, Hazardous Materials Accidents, Hurricanes, Terrorism, Thunderstorms/Lightning and Transportation Incident/Accidents. Table 3 – 11, Risk Assessment by Jurisdiction the risk of hazards by each area using various factors and a probability of occurrence scale. More detailed information for each jurisdiction can be found in Appendix E.

**HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019**

**EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED**

4. Capability Assessment

Policies, Programs and Plans

Forrest County, the City of Hattiesburg, the City of Petal, and the Emergency Management District have numerous policies, programs and plans in place that affect hazard mitigation. The most important asset of each participating jurisdiction is the employees. These employees respond to events, implement programs and administer policies that ensure Forrest County is a safe place to live.

First responders, such as police and fire personnel from the cities of Hattiesburg and Petal, sheriff and volunteer fire personnel from Forrest County and the Emergency Management staff are trained to recognize and react to hazardous events and mitigate damage.

City and County governing officials use legislative authority to protect the public by adopting ordinances and programs that mitigate hazards. The governing authorities of the City of Hattiesburg, the City of Petal and Forrest County adopt polices that are enforced by planning staff and building inspectors. This process makes safe communities and mitigates potential hazards in the participating jurisdictions. The following is a list of plans and ordinances that each jurisdiction and organization has that mitigates hazards within Forrest County.

Table 4 –1, Plans and Implementation Measures

Jurisdiction	Comprehensive Plan	Zoning Ordinance	Subdivision Ordinance	Floodplain Ordinance	Stormwater Ordinance	Disaster Preparedness Plan	MPO Transportation Plan	Building Codes
Hattiesburg	X	X	X	X	X	X	X	X
Petal	X	X	X	X	X	X	X	X
Forrest County			X	X	X	X	X	
Emergency Management District	X (CEMP)					X	X	

Source: Forrest County Planning Department, 2006 and 2013.

HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019
EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED

The three planning documents - Comprehensive Plan, Disaster Preparedness Plan and the Metropolitan Planning Organization (MPO) Transportation Plan - provide goals and objectives for the corresponding entity and the other ordinances - Zoning Ordinance, Subdivision Ordinance, Floodplain Ordinance, Stormwater Ordinance and Building Codes – are the implementation tools for the plans and hazard mitigation.

As these plans and policies are updated, each jurisdiction, using a traditional planning approach, will continue to incorporate mitigation practices into the documents through the ordinance implementation and administrative process. Each participating jurisdiction incorporates some type of hazard mitigation daily through ordinance implementation and administration. This includes the use of building permits, site plan review, flood permits and other land development tools.

Planning Tools

Comprehensive Plan

The City of Hattiesburg’s 2028 Comprehensive Plan was adopted on December 16, 2008 and Hattiesburg is in the process of updating the Land Development Code. The “Getting on Track for Hattiesburg’s Future” Comprehensive Plan has the following components:

- Introduction
- Executive Summary
- The Comprehensive Planning Process
- Goals and Strategies
- The Character of Hattiesburg: Physical, Social and Economic
- The Natural Environment
- Land Use and Development
- Infrastructure
- Community Facilities and Services
- Action Plan

The City of Petal’s Comprehensive Plan was adopted May 3, 2005 and the comprehensive plan has the following components:

- Goals and Objectives
- Land Use Plan
- Transportation Plan
- Community Facility Plan

HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019
EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED

The Emergency Management District has a Comprehensive Emergency Management (CEMP) Plan that includes the following areas for all types of emergencies in Forrest County:

- Prevention
- Preparedness
- Response
- Recovery
- Mitigation

Prevention

Prevention is any action that avoids an incident, reduces the effect of, or so intervenes as to stop an incident from occurring. Prevention involves actions to protect lives and property. It involves applying intelligence and other information to a range of activities that may include countermeasures such as deterrence operations; heightened inspections; improved surveillance and security operations; investigations to determine the full nature and source of threat; public health and agricultural surveillance and testing processes; immunizations, isolation, or quarantine; and appropriate specific law enforcement operations aimed at deterring, preempting, interdicting, or disrupting illegal activity and apprehending potential perpetrators and bringing them to justice.

Preparedness

Preparedness includes deliberate tasks and activities necessary to build, sustain, and improve the operational capability to prevent, protect against, respond to, and recover from domestic incidents. Preparedness is a continuous process that involves efforts at all levels of the public and private sectors to identify threats, determine vulnerabilities, and identify requested resources. Preparedness is also defined as actions taken in advance of an emergency or disaster to develop operational capability and facilitate response operations. Such measures include the development of plans, procedures, warning and communication systems, training and exercises, mutual aid agreements, and emergency public information packages.

Some examples include:

- Developing, revising, and exercising the Forrest County's *Emergency Operations Plan* (EOP) to determine possible weaknesses and corrective actions needed.
- Training and exercising personnel in assigned responsibilities.

HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019
EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED

- Coordinating with other local agencies, volunteers, and the private sector in the Forrest County Emergency Operations Center (EOC) and maintaining an adequate reserve of resources.
- Preparing, in coordination with lead county officials, public information for emergency release in different languages if necessary.

Response

Responses are activities that address the short-term, direct effects of an incident. Response includes immediate actions to save lives, protect property, and meet basic human needs constitute the response phase. Response also includes the execution of EOPs and of mitigation activities designed to limit the loss of life, personal injury, property damage, and other unfavorable outcomes. Response also includes efforts to begin the process of returning to pre-emergency conditions. As indicated by the situation, response activities include:

- Applying intelligence and other information to lessen the effects or consequences of an incident
- Increased security operations
- Continuing investigations into the nature and source of the threat
- Ongoing public health and agricultural surveillance and testing processes
- Immunizations, isolation, or quarantine
- Specific law enforcement operations aimed at preempting, interdicting, or disrupting illegal activity, and apprehending actual perpetrators and bringing them to justice
- Notifying officials and assigned personnel.
- Activating the EOC according to need.
- Coordinating emergency operations.
- Establishing priorities and allocating resources.
- Mobilizing personnel and equipment.
- Implementing evacuation and sheltering plans for senior citizen centers, hospitals, and livestock, special needs and prison populations.
- Other emergency operations such as searching and rescuing, clearing debris, providing emergency medical services, firefighting, etc.

Recovery

Recovery is a process involving the restoring and rebuilding of communities, lives, property, and economy and includes short-term and long-term phases. Recovery must begin as soon as possible, sometimes during the response phase. The Forrest County Emergency Manager initiates procedures to assess needs and resources, establish

HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019
EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED

priorities, reviews state and federal aid criteria and coordinates with representatives from both levels of government. Once the extent of the recovery effort is determined, the appointed recovery team members determine how best to manage the specific activities, what resources and personnel will be required and what other actions are needed to return the impacted areas to normal operations as quickly as possible. (Additional long-term recovery is available in Emergency Support Function # 14)

Recovery includes:

- The development, coordination, and execution of service and site-restoration plans
- The reconstitution of county/local government operations and services
- Individual, private-sector, non-governmental, and public-assistance programs to provide housing and to promote restoration
- Long-term treatment of affected persons
- Additional measures for social, political, environmental, and economic restoration
- Evaluation of the incident to identify lessons learned
- Post-incident reporting
- Development of initiatives to mitigate the effects of future incidents

The CEMP includes 15 Emergency Support Functions (ESF) that each provides a purpose, scope of work, coordinator, primary agencies, support agencies and response. The ESF are as follows:

- ESF-1 Forrest Co. Transportation Response
- ESF-2 Forrest Co. Communications
- ESF-3 Forrest Co. Public Works and Engineering
- ESF-4 Forrest Co. Fire Services
- ESF-5 Forrest Co. Emergency Management
- ESF-6 Forrest Co. Mass Care, Housing, and Human Services
- ESF-7 Forrest Co. Resource Support
- ESF-8 Forrest Co. Public Health and Medical Services
- ESF-9 Forrest Co. Search and Rescue
- ESF-10 Forrest Co. Oil and Hazardous Materials
- ESF-11 Forrest Co. Animals, Agriculture & Natural Resources Response
- ESF-12 Forrest Co. Energy
- ESF-13 Forrest Co. Public Safety and Security

HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019
EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED

- ESF-14 Forrest Co. Long Term Recovery
- ESF-15 Forrest Co. External Affairs

Disaster Preparedness Plan

Each participating jurisdiction has a Disaster Preparedness Plan that provides standard operating procedures during disasters. The disaster preparedness plan ensures that each participating jurisdiction has measures in place to effectively govern to protect public health and safety during a disaster.

Metropolitan Planning Organization Transportation Plan

The Hattiesburg-Petal-Forrest-Lamar Metropolitan Transportation Plan 2035, which includes the City of Hattiesburg, the City of Petal, Forrest County and Lamar County, is the current plan for the Metropolitan Planning Organization (MPO). The Metropolitan Transportation Plan 2035 has the following elements:

- Introduction and Transportation Planning Process
- Public Outreach
- Demographic Data Trends and Projections
- Financial Analysis and Fiscal Constraint
- Streets and Highways
- Public Transit
- Bike and Pedestrian
- Regional Safety
- Regional Security
- Environmental Mitigation Analysis
- Staged Improvement Program

Implementation Tools

Zoning Ordinance

The City of Hattiesburg and the City of Petal have Land Development Codes (LDC) that in addition to regulating zoning and uses allowed in each zone, also regulates open space, parking, buffers, green space, tree plantings and impervious surface requirements for each zone and/or use. These items help with drainage and storm water issues, as do other sections of the LDC such as: requirements for streets, land subdivision, planned unit or planned residential developments, sewers, utilities, water supply, environmental design and storm drainage systems. The City of Hattiesburg has a Site Plan Review Committee that at a minimum looks at the following items for each proposed new development or addition:

HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019
EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED

- Exact location of all buildings and structures
- All means of ingress and egress
- All screens and buffers
- Off-street parking and loading areas
- Refuse collection areas
- Access to utilities and points of utilities hookup
- Natural features such as streams, lakes or other topographic features
- Grading plan
- Storm drainage and sanitary sewer plans
- Architectural definitions for buildings in the development; location, size and types
- Plans for recreation facilities, if any, including buildings for such use
- Such additional data, maps, plans, or statements as may be required for the particular use or activity involved or that the applicant may believe is pertinent to the site development plan.

Additionally, the site plan shall be approved only after a consideration of the following factors:

- Ingress and egress to the property
- Drainage on the property that does not adversely affect neighboring properties or public storm drainage systems and will, so far as practical, conserve the water resources of the area and avoid flooding, erosion, and detrimental depositing of sediments of any kind
- All utility connections
- Off-street parking and loading areas
- Recreation and open spaces
- Density and/or purpose of the development
- General site arrangement, amenities, and convenience, including disposal of waste and noise
- All setbacks, parking areas and accessory structures that are landscaped, located and constructed so as not to interfere with the use of the surrounding property or cause any adverse effect upon the environment or nearby property.

Subdivision Ordinance

The City of Hattiesburg subdivision regulations are included in the Land Development

HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019
EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED

Code, Ordinance No. 2330, adopted December 05, 1989, and declare that the subdivision of land is an important part of the community development process because the welfare of the entire community is affected in many important respects by the subdivision and subsequent development of its lands. The regulation of the subdivision of property is intended to and should be administered in a manner that will implement the Comprehensive Plan; harmoniously relate development of various tracts of land with overall community needs; establish minimum criteria and standards to which improvements shall be installed and/or constructed; and provide a means for the orderly recordation of the subdivided parcels as well as the location and salient features of improvements thereto. The following outlines those requirements:

- The title under which the proposed subdivision is to be recorded
- Date of preliminary plat, location, north arrow, scale of plat in graphic form
- Vicinity map
- Location and size of existing streets, water, sewer, and other utilities to which the proposed development is to be connected or otherwise abutting the property.
- Present zoning classifications of the land to be subdivided and the zoning classifications of adjacent land and/or subdivisions
- Total acreage of the land to be subdivided and the number of lots proposed
- Maximum of two (2) foot Contour lines of ground elevations, based on Mean Sea Level
- Special Flood Hazard Areas delineated
- Location, name and dimensions of proposed streets, street improvements and right-of-ways, alleys, easements, lot and block numbers and lot lines
- Sites, if any, to be reserved or intended to be dedicated for parks, playgrounds, open spaces, lakes, ponds and other public uses.

The City of Petal's Subdivision Ordinance was adopted March 19, 1991 and includes the following:

- Definitions and Procedures
- Road Plat
- Surveys, Minimum Standards, and Design
- Improvements Required in Subdivisions
- Specifications and Minimum Design Standards and Roads and Streets

**HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019**

**EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED**

- Procedure to Secure Approval of Plans for Construction of Roads and Streets in Newly Dedicated Subdivisions
- Repeal of Conflicting Orders
- Penalty

Forrest County amended its subdivision ordinance on March 5, 2011. This update was the first revision since April 9, 1987. The primary changes with this update were related to density and strengthen the roadway dedication requirements. All development that has more than four units per acre is considered a subdivision and requires Board of Supervisors approval. Road improvements include a minimum right of way of at least 50 feet and three onsite visits by County Engineer to ensure conformity with the specifications and standards. Another element is the incorporation of a variance procedure. The applicant must prove to the Board that the requested variance will not adversely impact the health, safety, and/or general welfare of prospective residents of the proposed development, adjoining property owners, emergency personnel and/or general public. The following elements are included in the ordinance:

- Definition and Procedure
- Plat
- Surveys, Minimum Standards, and Design
- Improvements Required in Subdivisions
- Specifications and Minimum Design Standards and Roads and Streets
- Procedure to Secure Approval of Plans for Construction of Roads and Streets in Newly Dedicated Subdivisions
- Variances
- Repeal of Conflicting Orders
- Penalty

Floodplain Ordinance

The City of Hattiesburg's Flood Ordinance Number 2345 adopted May 8, 1990, codified in the Code of Ordinance as Chapter 10. Section 10-7 of this ordinance defines Substantial Improvement and Section 10-42 regulates elevation requirements, flood proofing, elevated buildings and the non-conversion of the areas below the elevated building, Manufactured (Mobile) Homes, and other developments in all flood zones and the floodway. Section 10-43 outlines the requirements and standards for streams without established base flood elevations and/or floodways. The City of Hattiesburg currently maintains a Class 7 under FEMA's Community Rating System. This Class 7 rating provides for an automatic 15% discount off the National Flood Insurance Rate for our citizens. Hattiesburg expects to file a modification application within the next few

HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019
EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED

months, and if successful will become at least a Class 6, which would offer citizens a 20% discount (possibly Class 5 – 25% discount as discounts are provided at 5% per class).

In the City of Hattiesburg, for the elevation of those properties outside a flood zone, Ordinance Number 1858, adopted April 4, 1976, codified as Section 22-6 of the Code of Ordinances, would apply, which states:

- A. The first floor of all buildings erected from the date of the passage of this section shall be elevated at least twelve (12) inches above the crown or center of the highest adjoining street.
- B. A variance to paragraph A of this section may be granted by the governing authorities upon a proper showing that the grounds upon which said building is being erected are high enough in elevation to make the building safe from flooding by surface water and sewer backup.

The City of Petal's Floodplain Ordinance No. 93 was adopted May 5, 1998. Forrest County's Floodplain Damage Prevention Ordinance was amended and on September 1, 2011, and includes the following contents:

- Statutory Authorization, Findings of Fact, Purpose and Objectives
- Definitions
- General Provisions
- Administration
- Provisions for Flood Hazard Reduction
- Variance Procedures
- Severability
- Effective Date, Publication, and Repeal of Prior Flood Damage Prevention Ordinance

Stormwater Ordinance

Forrest County adopted a Stormwater Ordinance that regulates Stormwater Runoff, Illicit Discharge and Illegal Connections on January 6, 2005. The City of Petal adopted a Stormwater Ordinance No. 106 on November 16, 2004.

The City of Hattiesburg Ordinance Number 2947, adopted on February 20, 2007, formally put in place the policies and procedures for erosion and sediment controls that the City has been following since 2003 for compliance with Storm Water Phase II of the Mississippi Department of Environmental Quality.

HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019
EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED

These documents have the following sections:

- Introduction
- Definitions
- Applicability
- Responsibility for Administration
- Severability
- Policy
- Construction and/or Industrial Activity
- Access and Monitoring of Properties, Facilities, and Discharge Points
- Best Management Practices
- Watercourse or Easement Protection
- Notification of Spills
- Violations
- Penalties and Prosecution
- Appeals

Building Codes

The City of Hattiesburg and the City of Petal have building codes that mitigate the loss of buildings due to high winds. The City of Hattiesburg has required building permits since the adoption of Ordinance Number 226 on April 12, 1905, and the City of Petal since Ordinance No. 18 from April 1, 1975. Ordinance Number 439, adopted on September 2, 1915, created the office of Building Inspector and outlined his duties. Several ordinances were created regulating various aspects of building between 1897 and the adoption of the first building codes, which were adopted by Ordinance Number 1444 on December 12, 1962. Hattiesburg has maintained building codes since that time, first under the Southern Building Codes, and currently under the 2003 International Codes.

As part of the adopted codes, Hattiesburg has also followed said Codes guidelines for wind loads, compaction and other safety measures. Per Section R403.1.4 of the International Residential Building Code, Hattiesburg requires “all exterior footings to be placed at least 12 inches below the undisturbed ground surface.” The University of Southern also has building codes that fall under the State of Mississippi for all state buildings.

Other Mitigation Programs

Overall

The Emergency Management District provides effective emergency management services in accordance with the State of Mississippi Emergency Management laws and

**HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019**

**EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED**

plan. The Emergency Management District implements and maintains an exemplary telecommunications program, including an emergency communications system, 911 emergency telephone system and local government communications support. The District provides an efficient organizational structure that supports these services and protects and benefits of the citizens of Forrest County and the cities of Hattiesburg and Petal.

Dams

Owners of dams are required by the State of Mississippi to have an Emergency Action Plan on file with the Emergency Management Agency. The owners are also required to monitor their lakes on a daily and/or weekly basis to inspect the property for problem areas.

Drought and Extreme Heat

To assist Forrest County mitigate against drought and extreme heat, the Forrest County Soil and Water Conservation District (SWCD) is charged with the responsibility of implementing a program of soil and water conservation in the county. The Forrest County SWCD is a governmental subdivision of the State of Mississippi formed on April 4, 1938, through House Bill 454. The citizens of Forrest County organized the Forrest County SWCD in 1945.

Five commissioners govern the Forrest County SWCD. Three are elected in a district-wide (county) election by landowners. The Mississippi Soil and Water Conservation Commission, upon recommendations of the SWCD board of commissioners, appoint two. Each District is authorized to appoint five deputy commissioners. These commissioners serve without pay to carry out a cooperative program that addresses the natural resource concerns of the District.

The goals of the District are to preserve natural resources, improve water quality, control floods, prevent impairment of dams, preserve wildlife, protect public lands and protect wetlands and include the following:

- Control and prevention of soil erosion
- Improve water quality
- Flood control
- Prevent impairment of dams and reservoirs
- Preserve wildlife
- Protect public lands
- Protect wetlands

HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019
EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED

- Develop private lands and waters for recreational purposes
- Promote economic welfare
- Provide leadership in the promotion of the conservation

Staff and Commissioners have the responsibility to recognize and determine conservation and achieve goals. Staff of the SWCD includes a District Conservationist, a Soil Conservationist, a Soil Conservation Technician, and an Urban Conservationist.

Earthquakes

Forrest County is located in Region V of the New Madrid Fault. A resource for earthquake mitigation is the Central U.S. Earthquake Consortium (CUSEC) that was established in 1983 with funding from the Federal Emergency Management Agency.

CUSEC is a partnership of the federal government and the eight states most affected by earthquakes in the central United States. Those states are: Alabama, Arkansas, Illinois, Indiana, Kentucky, Mississippi, Missouri, and Tennessee. CUSEC's primary mission is, "... the reduction of deaths, injuries, property damage and economic losses resulting from earthquakes in the Central United States."

CUSEC coordinates the multi-state earthquake mitigation efforts of the central region. This critical role is mainly to facilitate activities, not to implement emergency management functions that are the responsibility of each individual state.

The CUSEC Board of Directors has identified six major goals within the Strategic Plan that include the following: Outreach Goals of multi-state planning, public awareness and education, mitigation; research and the Foundation Goals are resource development and constituency building. The four-outreach goals address the planning, preparation and knowledge processes. The two foundation goals, resource development and constituency building, provide the organization with the structure and influence to accomplish the four outreach goals.

CUSEC provides many educational resources and public awareness brochures. Examples of these include but are not limited to Earthquake Mitigation, Family Safety, Home Survival Pack, and Personal Disaster Kit. CUSEC is a resource for transportation issues related to earthquakes, donations management issues, housing recovery initiatives and earthquake exercises.

Floods and Flash Flooding

HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019
EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED

There are five reporting stations located in Forrest County that monitor rainfall amounts. One is located in the Brooklyn community, one in Petal and three in the City of Hattiesburg. There are also four river gauges in Forrest County. These are along Black Creek, Gordon's Creek and the Leaf and Bouie rivers. These instruments are used to monitor flash flooding and flooding for Forrest County.

To mitigate flash flooding and flooding, the City of Hattiesburg has an ongoing drainage enhancement program. Over the last 12-13 years, the City of Hattiesburg, in conjunction with state and federal agencies, has completed over 19.5 million dollars in drainage enhancement projects, resulting in tremendous drainage improvements in Hattiesburg, which may have reduced the flood hazard area.

Over the past two years, the City of Petal with other agencies has spent approximately \$400,000 on drainage enhancement projects. Petal has also recently entered into a contract to produce aerial photography with 2-foot contours for the entire city. This will assist the city with a drainage plan and will mitigate flash flooding and flooding. Forrest County and the City of Petal have had Stormwater Ordinances since 2005 and the City of Hattiesburg adopted a Stormwater Ordinances in 2007.

In 2010, members of the Multi-jurisdictional taskforce embarked on a flood inundation project. The purpose of this project ~~was to~~ will allow residents to estimate the potential for flooding based on the flood level of the Leaf River. The information is placed on each participating jurisdiction's website and allows users to access the appropriate information. The Council anticipates this form of information will further educate the residents of the dangers of flooding and give a historical overview of the hazard and its effect on local development. All the participating jurisdictions participate in the National Flood Insurance Program (NFIP) and make every effort to ensure adherence to the program guidelines. As outlined in the Table 4-1, various planning tools have been implemented to provide a nexus between development and education. Properties that continually receive flood damage that meet the substantial improvement threshold are identified as repetitive loss properties. Once a property receives that designation—effort is made to relocate the individual(s).

The local chapter of the American Red Cross provides a brochure in the form of a flood safety checklist. This brochure is attached as Appendix I. The brochure has important information on what to expect and what a person should do during a flood watch and flood warning as well as a household preparedness checklist.

HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019
EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED

Hail

As a part of the National Oceanic and Atmospheric Administration (NOAA) the National National Severe Storms Laboratory (NSSL) provides educational information about questions and answers on hail, detecting hail, forecasting hail, and so forth. The NSSL has refined technology of Doppler radar that indicates whether a storm is producing hail. This technology today is called Enhanced Hail Diagnosis Algorithm (EHDA) that uses multiple radars to indicate whether a storm is producing hail. NSSL engineers are currently enhancing polarimetric technology that will use polarimetric radar, horizontal and vertical pulses, to identify the specific hail location, not the probability of hail.

Hazardous Material Accidents

The Hattiesburg Fire Department's Hazardous Materials (HazMat) Division is made up of 36 members of the department, all trained to the Hazmat Tech level. This team provides support to the City of Petal and Forrest County via inter-local agreements.

The team is the HazMat section of the South East One Regional Response (SE1RRT) team and therefore all members also have training in response to terrorist incidents of chemical, biological, radiological or nuclear attacks. Since Hurricane Katrina, the SE1RRT has also started receiving training in urban search and rescue and 12 members have attended Structural Collapse Tech classes in College Station, Texas.

As a response team HazMat is equipped to confine and contain leaking chemicals, analyze the hazard, make appropriate evacuations and provide decontamination services for any citizens that may have come in contact with the hazard. The HazMat team has a Mass Casualty Decon System that is designed to handle up to 200 patients per hour. The team is also equipped with air monitoring systems; biological weapons detection systems, chemical identity systems, radiological monitoring systems and chemical weapons detection systems.

The Hazmat/RRT team also provides services for the counties of Forrest, Lamar, Perry, Marion, Covington, Jones, Jeff Davis, Wayne and Green. Any response with this team as HAZMAT or RRT would be in conjunction with the local EOC in a unified command system for maximum efficiency. The state system of RRT has 9 teams across the state and should any incident overwhelm these capabilities, the Forrest County EOC would then contact MEMA or the Mississippi Department of Homeland Security to request activation of one of the other teams to assist.

Hurricanes, Tropical Storms and High Winds

HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019
EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED

Public education is a major mitigation activity for hurricanes, tropical storms and high winds. The local chapter of the American Red Cross provides various public education reports and publications that include: “Your Family Disaster Plan” and “Using a Generator When Disaster Strikes.”

The City of Hattiesburg and the City of Petal have building codes that mitigate the loss of buildings due to high winds. The City of Hattiesburg has required building permits since the adoption of Ordinance Number 226 on April 12, 1905. Ordinance Number 439, adopted on September 2, 1915, created the office of Building Inspector and outlined his duties. Several ordinances were created regulating various aspects of building between 1897 and the adoption of the first building codes, which were adopted by Ordinance Number 1444 on December 12, 1962. Hattiesburg has maintained building codes since that time, first under the Southern Building Codes, and currently under the 2003 International Codes.

As part of the adopted codes, Hattiesburg has also followed said Code guidelines for wind loads, compaction and other safety measures. Per Section R403.1.4 of the International Residential Building Code Hattiesburg requires “all exterior footings to be placed at least 12 inches below the undisturbed ground surface.”

Power Failure

In an effort to provide power to critical facilities after hazards, all participating jurisdictions need generators. Since 2007, a list of 73 critical facilities has been created which includes shelters, public buildings, an airport, zoo, water tanks/plants, sewer lift stations, and police and fire stations. Of these 73 facilities, a total of eleven generators have been purchased by the City of Hattiesburg, Forrest County and the City of Petal. See Appendix P, Generator Data Spreadsheet/City of Hattiesburg Generators that details the 73 facilities and locations of the critical facilities. Those locations that were next in order behind those receiving generators—will be moved higher on the priority scale. Information contained in the sheet along with priority placement was done by interviewing emergency personnel, maintenance supervisors and other agency representatives from each jurisdiction.

The local chapter of the American Red Cross provides a fact sheet on generator safety – “Safe Generator Use.” This fact sheet is attached as Appendix K.

Terrorism

The team is the HazMat section of the Southeast One Regional Response (SE1RRT) team and therefore all members also have training in response to terrorist incidents of

HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019
EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED

chemical, biological, radiological or nuclear attacks. Since Hurricane Katrina the SE1RRT has also started receiving training in urban search and rescue and 12 members have attended Structural Collapse Tech classes in College Station, Texas.

Thunderstorms and Lightning

For thunderstorms and lightning, public education efforts by National Oceanic and Atmospheric Administration (NOAA) provide safety tips during thunderstorms and lightning. A copy of "Weather Safety: Lightning" is attached as Appendix L.

Tornados and Funnel Clouds

The National Weather Service has designated Forrest County, the City of Hattiesburg, and the University of Southern Mississippi as Storm Ready jurisdictions. This designation recognizes those entities for their effectiveness in issuing National Weather Service watches and warnings. The University of Southern Miss is currently only the third university ever to receive the award and the first in Mississippi. Having three entities in Forrest County having this designation is also unique in Mississippi.

The City of Hattiesburg has an Early Warning Emergency Alert Program that provides NOAA Weather Radios to low-moderate income households of elderly or disabled Hattiesburg residents. The program was initiated in May 2003 and is totally funded through the City's Community Development Block Grant (CDBG) Entitlement Program. The weather radios provide immediate notice of storm alerts, watches or warnings. The radios also provide continuous monitoring of weather conditions, shelter locations and other valuable information during inclement weather.

The radios are distributed through several methods: public distribution, elderly and disabled residential communities or group homes; senior groups/organizational meetings; and homebound delivery.

The program consists of education, training, and installation of the radios and includes the following partners:

- U.S. Department of Urban Development - funding
- Emergency Management – training, programming of radios, distribution, store and maintain inventory
- National Weather Service - training
- The American Red Cross - training
- Housing Authority of Hattiesburg – recipients/training/maintenance

Transportation Incidents/Accidents

The participating jurisdictions can respond to transportation incidents and accidents that would include rail, air or ground. The substance of the incident dictates the type response and the agency responding. Mutual aid agreements exist between Forrest County and the City of Petal with the City of Hattiesburg and the Haz Mat Team for response anywhere in Forrest County. Mutual aid agreements also exist between the eight volunteer fire departments and with the City of Hattiesburg to supply water.

Urban and Wildfires

The City of Hattiesburg and the City of Petal's Fire Departments and Forrest County Volunteer Fire Departments provide fire safety education to the public and specifically school children. These organizations have programs for smoke alarm installation. The Mississippi Forestry Commission also provides public education on fire safety. Burn bans are issued as needed to prevent urban and wildfires through coordination of the Forrest County Board of Supervisors and the Mississippi Forestry Commission.

The local chapter of the American Red Cross provides "Fire Prevention and Safety Checklist" publication that details how households can be fire-safe, planning escape routes, and escaping safely. The brochure also includes a fire safety checklist. The brochure is attached as Appendix M.

Winter Storms

Since winter storms are not a frequent occurrence in south Mississippi, the participating jurisdictions do not have the proper equipment to respond to such a hazard. The necessary equipment can be brought in to assist the participating jurisdictions in responding to winter storms. As with any hazard that residents are provided a warning, the Emergency Management District requests residents have supplies at home to sustain their household for up to 72 hours.

5. Mitigation Strategies

Mitigation Goals to Reduce and Avoid Existing and Future Vulnerabilities

The following are goals that will reduce and potentially avoid long-term vulnerabilities to the identified hazards for Forrest County.

- Goal 1: Encourage the development and maintenance of facilities and infrastructure that will mitigate hazards.
- Goal 2: Foster an on-going community education program on hazard mitigation safety and preparation.
- Goal 3: Enhance response procedures and capabilities.
- Goal 4: Utilize technology to protect and develop records and data.
- Goal 5: Continue Coordination with Other Agencies**

Range of Mitigation Actions Considered

The range of mitigation actions *considered* includes:

- County critical facilities mitigation located in Special Flood Hazard Areas
- Mitigate critical facilities with generators – **Completed?**
- Provide railroad grade separation
- Long range planning in Forrest County
- Reestablish corridors along river and streambeds
- Pursue and buy those repetitive loss properties – **ongoing**
- Adoption of building codes in Forrest County
- Discourage development within the Special Flood Hazard Area and in the floodway – **ongoing**
- All hazard public education – **ongoing**
- Floodplain resident’s education – **ongoing**
- Alerting citizens to hazards using weather radios – **ongoing**
- Alerting citizens using siren system – **Tornado Sirens Completed**
- Debris removal – **ongoing**
- Equipment and training for gas plant disasters
- Police terrorism unit
- Accessible parcel data – **Completed?**
- Mapping groundwater flooding
- Preserving critical government documents
- Main Shelter Facilities – **Completed?**

**HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019**

**EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED**

- Development Regulations
- Equipment Purchases
- Property Protection Measures
- Implement existing recreation and river walk plans
- Coordination with adjoining agencies
- Partnerships with local universities

Process and Criteria to Prioritize and Select Actions for Implementation

After the multi-hazard mitigation committee completed the hazards and vulnerability analysis and the capability assessment, the committee developed projects and programs that if implemented will ~~reduce the~~ each participating jurisdictions threats to hazards. For each of the actions identified, a priority was based on five factors that include 1) effect on overall risk to life and property; 2) ease of implementation; 3) community support; 4) general economic cost/benefit review; and 5) funding availability. The mitigation actions included in the implementation of the plan are as follows.

Goal 1: Encourage the development and maintenance of facilities and infrastructure that will mitigate hazards.

Actions:

- Mitigate County critical facilities located in Special Flood Hazard Areas.
- Mitigate critical facilities with generators.
- Create a plan that addresses current and future issues in Forrest County.
- Reestablish corridors along river and streambeds in Forrest County.
- Actively pursue and buy those properties that are considered repetitive loss properties.
- Adoption of building codes in Forrest County.
- Discourage development within the Special Flood Hazard Area and in the floodway.
- Address the threat of unhealthy trees that are near critical facilities.
- Enhance shelter capabilities.
- Equipment Purchases for street cleaning, inspections and software and equipment that would allow for a more productive work flow
- Establish a revolving loan fund program for elevating all structures within SFHA and/or Tax Abatement
- Implement existing drainage maintenance/repair studies and create studies for additional areas of need
- Implement existing recreation and river walk plans

**HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019**

**EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED**

Goal 2: Foster an on-going community education program on hazard mitigation safety and preparation.

Actions:

- Educate property owners residing in flood zones on the flood risks and the benefits of acquiring flood insurance.
- Educate the citizens of Forrest County regarding stormwater, natural hazards and all related items.
- Alert citizens of approaching life-threatening weather events.

Goal 3: Enhance response procedures and capabilities.

Actions:

- Address the local need of debris removal and related items after a storm.
- Provide first responders in Petal with necessary equipment and training to respond to gas plant disasters.
- Develop a police response unit in Petal designed to deter acts of terrorism.

Goal 4: Utilize technology to protect and develop records and data.

Actions:

- Convert existing parcel data to a format accessible by other governmental offices and the general public.
- Map groundwater flooding areas.
- Preserve classified, confidential and/or important governmental documents.

Goal 5: Continue Coordination with Other Agencies

Actions:

- Coordination with Forrest and Lamar Counties, City of Petal and State agencies for possible joint projects
- Partnerships with local universities for future studies, such as master planning, economic development, architectural and site analysis and environmental or health studies

Mitigation Implementation

Each mitigation action for implementation identifies the following:

- Project Name
- Mitigation Action
- Mitigation Strategy

HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019
EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED

- Jurisdiction
- Priority
- Estimated Cost
- Potential Funding Sources
- Lead Agency or Agencies
- Implementation Schedule

Project Name: Residential Property Elevation
Goal: Elevate flood-prone properties.
Mitigation Strategy: Flooding
Jurisdiction: All Participating
Priority: High

Description: All participating jurisdictions seek to elevate existing properties that are within flood zones. Specifically, those flood-prone structures located in zones AE, A and the Floodway. The properties are identified for elevation will be classified as repetitive loss properties as defined by the Federal Emergency Management Agency (FEMA). In the absence of elevation; the alternative would be either acquisition or demolition.

Responsible Department(s): Forrest County Planning Department, City of Petal and the City of Hattiesburg.

Cost Estimate: Unknown
Funding Source: Federal and/or state grants.

Schedule: Within the next 5 years.

Project Name: Citizen Outreach
Goal: Educate the general public on potential hazards.
Mitigation Strategy: Education and/or Outreach
Jurisdiction: All Participating
Priority: Medium

Description: The members of the Hazard Mitigation Council seek to educate the citizens of Forrest County on storm preparedness through various outreach efforts. The outreach efforts will include, but not limited to the following: presentations at civic clubs and

HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019
EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED

neighborhood associations, storm preparedness on each participating jurisdiction's website and update the All Hazards brochure that was originally done in 2008.

Responsible Department(s): Forrest County Planning Department, City of Petal and the City of Hattiesburg.

Cost Estimate: \$8,000.00

Funding Source: General budgets from participating jurisdictions.

Schedule: Within the next 5 years

Project Name: Evacuation Planning
Goal: Review and update evacuation routes within County.
Mitigation Strategy: Education, Outreach and Emergency Services
Jurisdiction: All Participating
Priority: High

Description: Members from each jurisdiction will work in conjunction with the Emergency Management District and the Mississippi Department of Transportation to update evacuation routes throughout the county. Special emphasis will be given to streets and railroad crossings that have been closed.

Responsible Department(s): Forrest County Emergency Management

Cost Estimate: Unknown

Funding Source: General budgets from participating jurisdictions.

Schedule: Within the next 5 years.

Project Name: Enhancement of Governmental Websites
Goal: Enhance participating jurisdictions websites to notify citizens of disasters.
Mitigation Strategy: Education, Outreach and Emergency Services
Jurisdiction: All Participating
Priority: Medium

HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019
EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED

Description: Members from each jurisdiction will work in conjunction with their respective information technology departments or through contract labor to update and enhance websites. The purpose of the update is to provide a medium where citizens can receive updates regarding hazards, information on safety tips/procedures and other related information.

Responsible Department(s): Forrest County, City of Petal and the City of Hattiesburg.

Cost Estimate: Unknown

Funding Source: General budgets from participating jurisdictions.

Schedule: Ongoing.

Project Name: Flood Insurance Education Program
Goal: Develop a plan of action to educate the citizens of Forrest County and banking/real estate professionals.
Mitigation Strategy: Education and Outreach
Jurisdiction: All Participating
Priority: Medium

Description: Members from each jurisdiction will work to educate the general public and members of financial and real estate professionals on the benefits of flood insurance. The incorporation of such education programs will be done in an effort to protect all citizens from unnecessary losses that would be avoided with obtaining flood insurance.

Responsible Department(s): Forrest County, City of Petal and the City of Hattiesburg.

Cost Estimate: Unknown

Funding Source: Unknown

Schedule: Within the next 5 years.

Project Name: Educational Facilities Building Retrofits
Goal: Retrofit and/or construct saferooms at area schools.
Mitigation Strategy: Hurricanes

**HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019
EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED**

Jurisdiction: All Participating
Priority: High

Description: Participating jurisdictions seek to protect youth attending local schools from hurricanes, tornadoes and severe storms through the construction of safe rooms and building retrofits. Shelters and saferoom will be incorporated at all public schools in Forrest County.

Responsible Department(s): Forrest County, City of Petal and the City of Hattiesburg.

Cost Estimate: \$4,000,000.00
Funding Source: HMGP

Schedule: Within the next 5 years.

Project Name: Portable Cell Tower Implementation
Goal: Placement of portable cell towers for emergency workers.
Mitigation Strategy: Emergency Services
Jurisdiction: All Participating
Priority: Medium

Description: Members from each jurisdiction seek to incorporate portable cell towers for use by emergency-based workers during storm relief efforts. The placement of such technology would be valuable for workers to communicate to employees and other workers during times of disaster.

Responsible Department(s): Forrest County, City of Petal and the City of Hattiesburg.

Cost Estimate: \$100,000.00
Funding Source: HMGP

Schedule: Within the next 5 years

Project Name: Generator Purchase
Mitigation Action: Mitigate critical facilities with generators.

**HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019**

**EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED**

Mitigation Strategy: All Hazards
Jurisdiction: All Participating
Priority: High

Description: In an effort to provide power to critical facilities after hazards, all participating jurisdictions need generators for a total of 62 facilities that include shelters, public buildings, an airport, zoo, water tanks/plants, sewer lift stations, and police and fire stations. See Appendix P, Generator Data Spreadsheet/City of Hattiesburg Generators that details the 96 facilities and locations of the critical facilities. Generators will be used at the highest priority critical facilities as applicable.

Responsible Department(s): Forrest County Planning Department, Emergency Management, City of Petal Building Department and City of Hattiesburg Public Works

Cost Estimate: \$4,000,000.00

Funding Source: HMGP

Schedule: Within the next five years.

Project Name: Weather or Disaster Alert System
Goal: Alert citizens of approaching life-threatening weather events.
Mitigation Strategy: Sirens and NOAA Weather Radios
Jurisdiction: All Participating
Priority: High

Description: Forrest County seeks to purchase sirens and NOAA weather radios for the safety of its citizens. There will be one siren per area/quad. This will include the areas of Brooklyn, Carnes, Dixie, Glendale, Rawls Springs, Petal and Hattiesburg. Also, the objective is for each household to have at least one weather radio.

Responsible Department(s): City of Hattiesburg Planning Department, Forrest County Planning Department, City of Petal Fire Department and Emergency Management.

Cost Estimate: \$3,000,000.00

Funding Source: HMGP

Schedule: Within the next five years.

HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019
EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED

Project Name: Railroad Grade Separation
Mitigation Action: Provide four railroad overpasses
Mitigation Strategy: All Hazards
Jurisdiction: All Participating
Priority: High

Description: The City of Hattiesburg with Forrest County and the City of Petal seeks to construct four railroad grade separations along the east side of the City of Hattiesburg. The proposed project includes the Railroad Grade Separation project east of Marshall Durbin, east of downtown Hattiesburg to 4th Street. The objective of the Railroad Grade Separation project is to provide safe transportation routes for residents on the east side of Hattiesburg, in the City of Petal and Forrest County to have access free of rail traffic. Twenty-seven trains travel through this area daily and stall travel through this portion of Forrest County. This project mitigates all hazards that affect transportation and evacuation. For example, the proposed project will reduce the potential hazards of vehicles and train accidents and provide faster response time by first responders in the events of calls and hazardous events. This project will alleviate local traffic that cannot cross evacuation routes in the event of evacuations and contra flow transportation plans being implemented. Forrest County not only has hurricanes as a high hazard, but also receives residents evacuating from Florida, Alabama, Louisiana and coastal Mississippi traveling to and through Forrest County. The project area is also located in and around a floodplain area. Map 3 –7, City of Hattiesburg Floodplain, shows the location of the flood hazards in the area around the Railroad Grade Separation Phase I project. In the event of a flood or flash flood, the railroad grade separations will assist with evacuation of residents in these areas of Hattiesburg and Petal.

Responsible Department(s): City of Hattiesburg Public Services and Emergency Management.

Cost Estimate: \$37,800,000.00

Funding Source: HMGP and other grant sources.

Schedule: Within the next five years.

Project Name: Equipment Purchase

**HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019**

**EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED**

Mitigation Action: Address the local need of debris removal and related items after a storm.
Mitigation Strategy: High Winds, Flooding, Landslides, Winter Storms, and Hail
Jurisdiction: All Participating Jurisdictions
Priority: High

Description: In an effort to improve the capabilities of removing debris caused by flooding and wind events, Forrest County seeks to purchase additional chipper/shredders and chip truck, purchase of knuckle boom equipment and other types of equipment for debris removal and disposal. Also, each participating jurisdiction needs skid steers for debris removal and disposal.

Responsible Department(s): Forrest County Road Department, Forrest County Planning Department and Emergency Management

Cost Estimate: \$500,000.00

Funding Source: HMGP and other grant sources.

Schedule: Within the next five years.

Project Name: Hazard Related Public Information
Mitigation Action: Educate the citizens of Forrest County regarding stormwater, natural hazards and all related items.
Mitigation Strategy: All Natural Hazards
Jurisdiction: Forrest County, City of Hattiesburg and City of Petal
Priority: High

Description: Members from each participating jurisdiction will participate in programs to inform the public about SFHA, stormwater management, NFIP and storm preparedness. This form of public education will include public service announcements (PSAs), flyers, brochures, and public meetings.

Responsible Department(s): Forrest County Planning Department, City of Hattiesburg Planning Department and City of Petal Building Department

Cost Estimate: \$ 15,000.00

HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019
EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED

Funding Source: HMGP, local budgets and or state/federal sources.

Schedule: On-going.

Project Name: Hot Zone Mitigation Gas Plants
Mitigation Action: Provide first responders in Petal with necessary equipment and training to respond to gas plant disasters.
Mitigation Strategy: Hazardous Inventory and Risk, Chemical Spills and/or releases, fire and acts of terrorism
Jurisdiction: City of Petal
Priority: High

Description: The City of Petal seeks to incorporate the necessary equipment to adequately respond to disasters related to area gas plants. A majority of the necessary equipment will be firefighting apparatus along with a possible ladder truck. There is a large gas plant within the boundaries of the city and any major disaster would related to it would cause a severe strain on the local agency.

Responsible Department(s): City of Petal Fire Department

Cost Estimate: \$850,000.00

Funding Source: HMGP.

Schedule: Within the next five years.

Project Name: Hazard Traffic Flow Digital Signs
Mitigation Action: Provide portable digital signs for public communication
Mitigation Strategy: All Hazards
Jurisdiction: All Participating Jurisdictions
Priority: High

Description: Members from each jurisdiction seek to purchase fifteen portable digital signs for communication with the motoring public during hazardous events.

Responsible Department(s): Forrest County Planning Department, City of Hattiesburg Public Services and City of Petal Building Department.

HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019
EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED

Cost Estimate: \$400,000.00

Funding Source: Federal and state grants.

Schedule: Within the next five years.

Project Name: Critical Facility Relocation
Mitigation Action: Mitigate County critical facilities located in Special Flood Hazard Areas
Mitigation Strategy: Flooding
Jurisdiction: Forrest County, City of Hattiesburg and City of Petal
Priority: Low

Description: Members from each jurisdiction will actively pursue funding to relocate, retrofit or raise county owned critical facilities located within the Special Flood Hazard Area.

Responsible Department(s): City of Hattiesburg Urban Development, Forrest County Planning Department and City of Petal Building Department.

Cost Estimate: \$600,000.00

Funding Source: Federal and state grants.

Schedule: Within the next five years.

Project Name: Stream Corridor Reforestation
Mitigation Action: To reestablish corridors along river and streambeds in Forrest County.
Mitigation Strategy: Flooding, Land slide, and Erosion Control
Jurisdiction: Forrest County, City of Hattiesburg and City of Petal
Priority: Low

Description: Each participating jurisdiction will work with the local Soil and Water Conservation District, Natural Resources Conservation Service and the Forest Service to establish reforested corridors along river and stream beds.

HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019
EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED

Responsible Department(s): City of Hattiesburg Urban Development, Forrest County Planning Department and City of Petal Building Department.

Cost Estimate: \$550,000.00

Funding Source: Emergency Watershed Protection (EWP) and other environmentally based programs.

Schedule: Within the next five years.

Project Name: Acquisition/Relocation
Mitigation Action: Actively pursue and buy those properties that are considered repetitive loss properties.
Mitigation Strategy: Flooding
Jurisdiction: Forrest County, City of Hattiesburg and City of Petal
Priority: Low

Description: Representatives from each jurisdiction will develop a prioritized list of properties that are within the Special Flood Hazard Area (SFHA). The county will then acquire (buyout) these properties if state or federal monies are available. The primary emphasis will be on existing repetitive loss properties.

Responsible Department(s): City of Hattiesburg Public Services, Forrest County Planning Department, City of Petal Building Department and Emergency Management.

Cost Estimate: \$2,200,000.00

Funding Source: Federal and state grants.

Schedule: Within the next five years.

Project Name: Development and Higher Regulatory Regulations as outlined in table below
Mitigation Action: Development Regulations
Mitigation Strategy: Flooding
Jurisdiction: City of Hattiesburg
Priority: High

**HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019**

**EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED**

Description: City of Hattiesburg seeks to adopt and implement multiple development and higher regulatory standards by way of adopting policy resolutions, revising the Land Development Code and the Flood Prevention Ordinance to mitigate hazards for future buildings and infrastructure. These regulatory standards will include:

CRS Element #	Acronym	Activity Description	Goal Description	Timeline
422.a, 422.b and/or 422.c	OSP, DR and/or NFOS	Open Space Preservation, Deed Restrictions, and/or Natural Functions Open Space – will vary per property	When the city acquires properties, by whatever means, consider setting aside a percentage of the land as perpetual open space - Policy Resolution needed with guidelines outlining the process for review and/or approval on a case-by-case basis	Establish Resolution in 2019
422.g	LZ	Low-density zoning	When the city acquires SFHA properties, by whatever means, consider utilizing low-density zoning if/when the lot size is appropriate or if we can assemble multiple adjoining properties - Policy Resolution needed with guidelines outlining the process for review and/or approval on a case-by-case basis	Establish Resolution in 2019
432.b	FRB	Freeboard	FMP Committee to re-visit increasing our Freeboard requirements	2019-2020
432.g	ENL	Enclosure limits	Create, implement and enforce non-conversion agreements	Agreement - early 2019
432.g	ENL	Enclosure limits	FMP Committee to re-visit a regulation prohibiting all enclosures on elevated structures	2019-2020
432.i	LDP	Local drainage protection	Extensive training to all appropriate City staff and outreach to all landscapers and nurserymen for stricter enforcement of current ordinance that prohibits blowing yard debris into the streets and/or drains	Early 2019

**HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019**

**EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED**

432.i	LDP	Local drainage protection	After training period and targeted outreach activities are completed actively enforce and levy fines for violators of this ordinance to help eliminate drain blockages	Early 2019
432.i	LDP	Local drainage protection	Require milling on all street re-paving projects, so that drains are not partially covered by new street layer	2018 and ongoing
432.i	LDP	Local drainage protection	Extensive outreach to all citizens for stricter enforcement of current containerization ordinance and Sec. 9.1 of the LDC; after training period and targeted outreach activities are completed actively enforce and levy fines for violators of this ordinance to help eliminate drain blockages.	Early 2019
452.b.1-8	WMP 1-8	Watershed Master Plan: Plan meets all the criteria listed in Sec 452.b	Creation of a Watershed Master Plan, including parts 1-8 of CRS requirements, phases done as funding is available and prioritized by most populated, starting with Gordon's Creek as Phase I.	2019 and ongoing over 3-5 years for completion of all Watersheds
512.a.03	FMP3	Floodplain Management Planning: Coordinate	Fully consider and utilize the Comprehensive Plan Action Items and the Metropolitan Transportation Plan for all future projects	2018 and ongoing
512.a.03	FMP3	Floodplain Management Planning: Coordinate	Prepare a comprehensive inventory of housing in the floodplain by quality (dilapidated, elevated, good condition, etc.); and seek funding to obtain elevation certificates throughout the SFHA to assist with re-development of area	2019-2021
512.b	RLAA	Repetitive loss area analysis	Inventory, data collection, outreach and preparation of a detailed mitigation plan for all Repetitive Loss areas with specific guidance on how to reduce damage	2018- early 2019
512.b	RLAA	Repetitive loss area analysis	After RLAA inventory and data collection is completed, implement identified property protection and/or drainage improvements	2019-2020 as funding is available

**HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019**

EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW

NEW FMP COMMITTEE GOALS HIGHLIGHTED

512.c	NFP	Natural floodplain functions plan	Create and adopt a Natural Floodplain Functions Protection Plan, including the ecological attributes of all watersheds and protection measures for shorelines, floodplain, habitat and wetland areas	2018-early 2019
532.a.2b	TUF	Structural flood control technique used: Storage Facilities	Engineering to actively pursue the installation of retention basins across city on existing vacant City owned land, to help reduce flooding.	2019 and ongoing
612.a	FTR	Flood Threat recognition system	Creation of Standard Operating Procedures for all department response plans for different event types, especially flooding and dam breach	2018-2019
612.d	CFP	Critical facilities planning	Outreach and individual contact with all Critical Facilities to update all information in conjunction with the Hazard Mitigation 5-year renewal	Early 2019
City Engineering is inventorying all shorelines within the City, identifying those that remain natural versus those that have been altered; upon completion of this project the following projects will apply:				Inventory in 2018-2019
422.h	NSP	Natural shoreline protection	Regulations need to be developed to protect the remaining natural shorelines	2019-2020
422.h	NSP	Natural shoreline protection	Re-visit to consider the establishment of larger setbacks, especially along the Leaf River and urbanized drainage/creeks.	2019-2020
542.a	CDR	Channel Debris Removal (CDR 1 - 6)	Finish inspections of all Community Flood Hazard Areas, maintain those as needed, budget for improvements where necessary, and report on those "unsolvable"	2019

**HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019**

**EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED**

542.b	PSM	Problem site maintenance	Inventory, identification and mapping of Problem Sites (choke points, flow obstructions, erosion/sedimentation problems or chronic dumping sites), including any identified resolution to problem (including channel modification) and increased inspection schedules for better maintenance included in the drainage maintenance resolution, if needed, including the who, what, when of inspections, for better maintenance of these areas	2019
542.d	SDR	Stream dumping regulations	Posting of "No Dumping Signs" at all identified locations,	2019
542.d	SDR	Stream dumping regulations	Outreach prohibiting dumping anywhere in city and	2019
542.d	SDR	Stream dumping regulations	Frequent patrolling, and fines levied for violators	2019 and ongoing

Responsible Department(s): City of Hattiesburg CRS Coordinator.

Cost Estimate: unknown

Source of Funding: General fund and applicable federal monies

Schedule: Within the next two - five years.

Project Name: Vacuuming Trucks/Equipment for Street Cleaning

Mitigation Action: Equipment Purchase

Mitigation Strategy: Flooding

Jurisdiction: City of Hattiesburg

Priority: High

Description: To improve the capabilities of removing small debris and leaves caused by flooding and wind events, the City of Hattiesburg seeks to purchase additional vacuuming equipment to keep leaves off the streets and out of drains.

**HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019
EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED**

Responsible Department(s): City of Hattiesburg Public Works Director

Cost Estimate: unknown

Funding Source: General fund and applicable federal monies

Schedule: Within the next three years and is projected for the 2021 City of Hattiesburg general fund and applicable federal monies.

Project Name: I-Pads or other Portable Computer Equipment for any department that requires fieldwork to streamline current workflows

Mitigation Action: Equipment Purchase

Mitigation Strategy: All Natural Hazards

Jurisdiction: City of Hattiesburg

Priority: High

Description: The City of Hattiesburg has software to prepare a tree inventory for the entire City to aid in identifying weak or damaged trees that need removal, healthy trees that assist with stormwater retention and those that help with bank stabilization, etc.; however, the work load of doing the work on paper in the field then entering again on computer is double the work load and would be more efficient with the purchase of portable equipment to accomplish the entire project in the field, thus saving manhours. Other departments, such as drainage inspections, bridge inspections, and the like may also need this type equipment.

Responsible Department(s): City of Hattiesburg (Arborist, Public Works, Engineering)

Cost Estimate: \$ 600.00 each unit

Funding Source: General fund

Schedule: Within the 2018-2019_budget for Tree Inventory

Project Name: Survey Equipment for Verifying Building Elevations

Mitigation Action: Equipment Purchase

Mitigation Strategy: Flooding

Jurisdiction: City of Hattiesburg

HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019
EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED

Priority: High

Description: The City of Hattiesburg has regulations that require elevation of certain structures, both in and out of a SFHA, but no way to accurately verify compliance on residential construction. Non-Residential Construction is verified by the Engineer for the project, and a Drainage Release is required on those that cannot meet the requirement.

Responsible Department(s): City of Hattiesburg Building Official

Cost Estimate: under \$500.00

Funding Source: General fund

Schedule: Within the 2018-2019 budget

Project Name: Additional Module(s) of EnerGov Software

Mitigation Action: Equipment Purchase

Mitigation Strategy: All Natural Hazards

Jurisdiction: City of Hattiesburg

Priority: High

Description: The City of Hattiesburg currently utilizes several modules of the EnerGov Software, but many need enhancing to better monitor hazards and elevation information, and interface with GIS. This will help us to ensure compliance and enforcement of CRS Activities specifically 310 and required mapping activities. Seamless connectivity between our GIS and the existing modules (Permitting, Privilege Licensing, Code Enforcement, and Planning) are essential for efficient data collection and mapping. Another important aspect of this software is the Land Management, Permitting and Licensing Customer Self Service Portal which would be a vital customer service tool.

Responsible Department(s): City of Hattiesburg IT Department

Cost Estimate: unknown

Funding Source: General fund and applicable federal monies

Schedule: Within the next three years

HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019

EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED

Project Name: Drone for use in field work in inaccessible locations
Mitigation Action: Equipment Purchase
Mitigation Strategy: All Natural Hazards
Jurisdiction: City of Hattiesburg
Priority: High

Description: The City of Hattiesburg is currently updating maps for all drainage, streams and rivers in the City. Many locations are inaccessible for accurately recording information and a drone would allow access to these areas.

Responsible Department(s): City of Hattiesburg GIS and/or Engineering

Cost Estimate: unknown
Funding Source: Applicable federal monies or other identified funding source

Schedule: Funding Source will have to be identified prior to scheduling

Project Name: KANA Enterprise: Knowledge Management Software (or comparable brand)
Mitigation Action: Equipment Purchase
Mitigation Strategy: All Natural Hazards and City functions
Jurisdiction: City of Hattiesburg
Priority: High

Description: City-wide centralized information system to improve inter-departmental relations and actions as to policies, procedures, ordinances, projects, status tracking and needed shared information for all internal staff. This would also allow standardized information distribution to all citizens for better customer service, including a detailed logging system all internal/external communications via telephone or E-Mail, thus reducing cost by being a more paperless City.

Responsible Department(s): City of Hattiesburg GIS and/or Engineering

Cost Estimate: unknown
Funding Source: Applicable federal monies or other identified funding source

HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019

EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED

Schedule: Funding Source will have to be identified prior to scheduling
Project Name: Establish a revolving loan fund program for elevating all structures within SFHA
Mitigation Action: Property Protection Measures
Mitigation Strategy: Flooding
Jurisdiction: City of Hattiesburg
Priority: High

Description: Revolving loan fund for elevating structures in the flood zone. Criteria could be income, personal funds, need of the structure, limitations on reinvestment due to value of structure ("substantial improvement", County tax assessment), must be in designated flood zone. Could be set up through local non-profit or foundation for management at a zero or low interest. Benefits of elevating through this fund include:

1. Improve safety of the structure by reducing the flood risk
2. Lower flood insurance costs by elevating structure
3. Keeps people in their communities, many of which are historic or established through multiple generations
4. Allows increased investment in a structure by property owners by eliminating the "substantial improvement" limitation.
5. Allows increased investment in a neighborhood overall
6. Requiring work to be done by a "local" contractor would keep the investment in the community. Could also require the work to be done by independently owned companies, minority owned companies, etc.

Responsible Department(s): City of Hattiesburg Administration and Planning

Cost Estimate: unknown
Funding Source: Applicable federal monies or other identified funding source

Schedule: Funding Source will have to be identified prior to scheduling

Project Name: Locate source of assistance to homeowner's on flood insurance cost
Mitigation Action: Property Protection Measures
Mitigation Strategy: Flooding
Jurisdiction: City of Hattiesburg
Priority: High

HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019

EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED

Description: We submitted a request to the State Auditor’s office asking “if a municipality could credit the cost of flood insurance to a homeowner’s property taxes that live in a flood zone, and the flood zone has been recognized and adopted by the municipalities board as a tax abatement district/zone?” The response from Thomas Chain, Director of Technical Assistance with the State Auditor’s office was “We find no authority for a municipality to offer a tax abatement for property taxes based on the cost of flood insurance”. The City of Hattiesburg will continue to look for other ways to assist citizens with this expense, to make insurance more affordable for our low-income citizens.

Responsible Department(s): City of Hattiesburg Administration

Cost Estimate: unknown

Funding Source: Applicable federal monies or other identified funding source

Schedule: Funding Source will have to be identified prior to scheduling

Project Name: Implement existing drainage maintenance and repairs identified in existing studies and create new studies for additional areas of need

Mitigation Action: Property Protection Measures

Mitigation Strategy: Flooding

Jurisdiction: City of Hattiesburg

Priority: High

Description: Drainage Studies have been completed on several areas – the 2 most recent are identified as “6th Avenue to Corinne Street” and “2017 Gordon’s Creek Drainage Study”. Many other areas of the City need such studies, and the City wishes to pursue funding for the implementation of existing studies, obtain additional studies throughout the City and implement the new studies, performing drainage improvements identified in all studies to decrease the flood potential in the entire City.

Responsible Department(s): City of Hattiesburg Administration

Cost Estimate: unknown

Funding Source: Applicable federal monies or other identified funding source

Schedule: Funding Source will have to be identified prior to scheduling

HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019
EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED

Project Name: Implement existing studies for streets, outdoor water spaces (recreation and river walks) and other issues
Mitigation Action: Implement existing recreation and river walk plans
Mitigation Strategy: Flooding
Jurisdiction: City of Hattiesburg
Priority: High

Description: The City has many studies on file that will enhance areas of our City while implementing storm water street islands or creating outdoor water areas for many items, such as recreational or river walks. An example of some of the pending studies are East Hardy Street, Twin Forks and Phase II of a Blue Way Project.

Responsible Department(s): City of Hattiesburg Administration

Cost Estimate: unknown
Funding Source: Applicable federal monies or other identified funding source

Schedule: Funding Source will have to be identified prior to scheduling

Project Name: Develop partnerships with local universities
Mitigation Action: Partnerships with local universities
Mitigation Strategy: All Hazard Types
Jurisdiction: City of Hattiesburg
Priority: High

Description: City wishes to develop partnerships with the University of Southern Mississippi and William Carey University to utilize their areas of expertise for future studies such as master planning, economic development, architectural/site analysis, natural resource, environmental and health studies, etc.

Responsible Department(s): City of Hattiesburg Administration

Cost Estimate: unknown
Funding Source: Applicable federal monies or other identified funding source

HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019
EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED

Schedule: Within one year

Project Name: Continued coordination with all area agencies
Mitigation Action: Coordination with adjoining agencies
Mitigation Strategy: All Hazard Types
Jurisdiction: All Jurisdictions
Priority: High

Description: All jurisdictions wish to continue coordination between agencies, including but not limited to, Forrest County, Lamar County, City of Hattiesburg, City of Petal, Emergency Management, University of Southern Mississippi, William Carey University, major businesses, health care facilities and state agencies for joint projects whenever feasible to protect all citizens in Forrest County and adjoining communities.

Responsible Department(s): City of Hattiesburg Administration

Cost Estimate: unknown
Funding Source: Applicable federal monies or other identified funding source

Schedule: Within one year

Policies and Programs

As discussed in Chapter 4, Capability Assessment, Table 4 – 1, Plans and Implementation Measures, each participating jurisdiction has policies and implementation tools in place to mitigate hazards. Also, the participating jurisdictions have capital improvement programs that can include mitigation strategies projects, either to totally fund, to partially fund, and/or to use as match with federal funds.

6. Plan Amendment

Evaluations and Updates

In accordance with 44 CFR 201.6(c)(4)(i), this plan will be periodically revised and updated to ensure that the goals outlined in this document along with mitigation actions continue to address the participating jurisdiction's specific vulnerabilities and are in full compliance with State and Federal Regulations. All participating jurisdictions will be involved in the Hazard Mitigation Council and each jurisdiction will annually rotate the responsibility for the coordination of the planning committee. The Hazard Mitigation Council will be responsible for evaluations and updates to the Hazard Mitigation Plan.

The Hazard Mitigation Council will meet at least quarterly to discuss and coordinate mitigation projects and review the Hazard Mitigation Plan. The results of the annual review will be summarized in a report and included with the plan as an appendix. Every three to five years, the plan will be reviewed to determine if significant changes have occurred that necessitate a plan update.

Continued Public Involvement

The Hazard Mitigation Council will ensure public involvement through the implementation of this plan and the review of the plan. This council will continue to be comprised of different segments of the community that include citizens, public officials, stakeholders and other interested groups.

In addition, each participating jurisdiction will have websites that provide information on the Hazard Mitigation Plan and ways for on-going public input on hazard mitigation and mitigation projects. Any public input will be a part of the Hazard Mitigation Council quarterly meetings and included in the annual review. When the Hazard Mitigation Plan is updated with significant changes, the amended plan will be adopted, and additional public hearings and reviews will be conducted.

Other Planning Mechanisms

As mentioned in Section 5, each participating jurisdiction has a number of regulatory policies in place that guide development. Examples of these planning mechanisms include the Comprehensive Plan, Zoning Ordinances, Building Codes, Flood Ordinances, and Stormwater Protection Ordinance. As revisions are made to these documents, each participating jurisdiction will ensure that hazard mitigation planning and elements of the

**HAZARD MITIGATION PLAN
PROPOSED FOR FEBRUARY 2019
EDITS IN RED FOR COREY @ FORREST COUNTY TO REVIEW
NEW FMP COMMITTEE GOALS HIGHLIGHTED**

Hazard Mitigation Plan are reviewed and where applicable, incorporated into the updated documents.

DRAFT

Prioritized Outreach Needs

Code Section Element No.	Acronym	PPI/ FMP Comm.	Element Description	Range of Mitigation Actions Considered for Goals	Creditable Activity	Sub Category	GOAL #	Status Notes
332.a	OP	x	Outreach Projects	update our current brochure and find other sources for distribution of info (see stakeholder delivery); maybe create brochure, etc. in English and Spanish	Public Info	Outreach	PPI	Annual Outreach Mailout must be done in November, 2018 (we have already rec'd a 6 month extension due to PPI creation-can't request another)
322.c	MI3		Other flood problems not shown on the FIRM	ongoing, but need to update "Known Flood Hazard Map" based on FMP input in step 4	Public Info	Outreach	PPI	part of annual outreach mailout (332.a)
322.d	MI4		Flood depth data	advertise availability	Public Info	Outreach/Map Info	PPI	part of annual outreach mailout (332.a)
322.f	MI6		Historical Flood Information	advertise availability	Public Info	Outreach/Map Info	PPI	part of annual outreach mailout (332.a)
322.g	MI7		Natural floodplain functions	advertise availability	Public Info	Outreach/Map Info	PPI	part of annual outreach mailout (332.a)
342.b	ODR	x	Other disclosure requirements	add to outreach any verified in "Preventive" on this activity (I think we may already qualify for: requiring final recorded subdivision plats to display SFHA; requiring deeds to show the lot or bldg. elevation & BFE need to verify)	Public Info	Outreach/Insurance	PPI	part of annual outreach mailout (332.a)
342.d & 632.c	DOH / DFW		Disclosure of other hazards/Dam Failure Warning	only one that would apply to us is possibly Dam or Levee Failure - others are Coastal (see proposed outreach project in 632.c)	Public Info	Outreach	PPI	part of annual outreach mailout (332.a)
352.a	LIB		Flood protection library	advising of the publications on hand at the library (9 required publications (see list in table 350-1 on page 350-3) housed/cataloged in Library - get updated letters from H'burg, USM both Cook/McCain library's; check w/Wm Carey and Lamar County and see if they have info or will add as well)	Public Info	Library	PPI	part of annual outreach mailout (332.a)
352.b	LPD		Locally pertinent documents	advise public of other items such as Flood Insurance Study, Hazard Mitigation Plan, Floodplain Management Plan and/or Ordinance, FIRM (1 point for each document) on hand at the library	Public Info	Library	PPI	part of annual outreach mailout (332.a)
362.a	PPA	x	Property Protection Advice	Advertise City gives 1 on 1 advise to property owners re: protection; City must identify 1 or more persons to give info; can be combined staff per their expertise (technical qualifications need to be provided); must be publicized annually (3 options: 1 to everyone; notice to affected areas; or PPI element provided the program identifies the audience for the service and discusses best way to reach said audience); records must be kept (memos, E-Mails, letters, etc., and include date and type of assistance given, details of findings and recommendations provided to inquirers; PPI must identify annually the effectiveness, and any changes recommended for improving effectiveness	Public Info	Outreach	PPI	part of annual outreach mailout (332.a)

Prioritized Outreach Needs

Code Section Element No.	Acronym	PPI/ FMP Comm.	Element Description	Range of Mitigation Actions Considered for Goals	Creditable Activity	Sub Category	GOAL #	Status Notes
362.b	PPV	x	Protection Advice provided after a site visit	Make sure we do and if so advertise - this is additional credit if advice in PPA above is given on site instead of in staff office; publicize service; PPA credit must include a discussion to the site visits and how they should be conducted; detailed records as in PPA	Public Info	Outreach	PPI	part of annual outreach mailout (332.a)
362.c	FAA	x	Financial assistance advice	Make sure we do and if so advertise - See list of Financial Assistance in Table 360-2, on page 360-8; publicized annually; 1 on 1; staff identified; records kept; PPI must include discussion of the service and recommendations on how should be conducted	Public Info	Outreach	PPI	part of annual outreach mailout (332.a)
372.a	FIA	x	Flood Insurance coverage assessment	Amend outreach materials to advertise this assessment - exampes are on-line	Public Info	Outreach Project	PPI	part of annual outreach mailout (332.a)
372.b	CP	x	Coverage Improvement Plan	Amend outreach materials to advertise this plan	Public Info	Outreach Project	PPI	part of annual outreach mailout (332.a)
372.c	CPI	x	Coverage Improvement Plan Implementation	Amend outreach materials to advertise how plan will be implemented	Public Info	Outreach Project	PPI	part of annual outreach mailout (332.a)
372.d	TA	x	Technical Assistance.	publicized annually; 1 on 1 w/citizen; qualified staff identified; records kept; PPI must include discussion of the service and recommendations on how should be conducted; FIA, CP and CPI are not required for this credit, but if plan is done, it must discuss providing technical assistance as a way to encourage people to purchase, maintain or improve their coverage	Public Info	Outreach/Technical Assistance	PPI	part of annual outreach mailout (332.a)
442.a	AMD01		Additional Map Data: SFHA, corporate limits, streets & lot boundaries	advertise availability of SFHA, corporate limits, streets & lot boundaries	Public Info	Map Info	PPI	part of annual outreach mailout (332.a)
442.a	AMD02		Additional Map Data: buildings, building outlines or footprints	advertise availability of buildings, building outlines or footprints	Public Info	Map Info	PPI	part of annual outreach mailout (332.a)
442.a	AMD03		Additional Map Data: floodways	advertise availability of floodway data	Public Info	Map Info	PPI	part of annual outreach mailout (332.a)
442.a	AMD04		Additional Map Data: base flood elevations	advertise availability of BFE's	Public Info	Map Info	PPI	part of annual outreach mailout (332.a)
442.a	AMD05		Additional Map Data: FIRM zone attributes	advertise availability of FIRM zone attributes	Public Info	Map Info	PPI	part of annual outreach mailout (332.a)
442.a	AMD06		Additional Map Data: 500-year floodplain elevations or boundaries	advertise availability of 500-year floodplain elevations or boundaries	Public Info	Map Info	PPI	part of annual outreach mailout (332.a)
442.a	AMD07		Additional Map Data: other natural hazards	advertise availability of other natural hazards	Public Info	Map Info	PPI	part of annual outreach mailout (332.a)
442.a	AMD08		Additional Map Data: topographic contour lines	advertise availability of topographic contour lines	Public Info	Map Info	PPI	part of annual outreach mailout (332.a)

Prioritized Outreach Needs

Code Section Element No.	Acronym	PPI/ FMP Comm.	Element Description	Range of Mitigation Actions Considered for Goals	Creditable Activity	Sub Category	GOAL #	Status Notes
442.a	AMD09		Additional Map Data: floodplain data in the tax assessment data base	advertise availability if County has floodplain data in the tax assessment data base through TSC?	Public Info	Map Info	FMP 0	part of annual outreach mailout (332.a)
442.a	AMD10		Additional Map Data: old FIRM's	advertise availability of old FIRM's	Public Info	Map Info	PPI	part of annual outreach mailout (332.a)
442.a	AMD11		Additional Map Data: other regulations	advertise availability of repetitive loss areas and any HAZUS-MH layers that we can utilize	Public Info	Map Info	PPI	part of annual outreach mailout (332.a)
442.a	AMD12		Additional Map Data: Natural floodplain functions	advertise availability of wetlands and area near Currie St/E Hardy St if we designate as Natural area restoration	Public Info	Map Info	PPI	part of annual outreach mailout (332.a)
442.a	AMD13		Additional Map Data: building elevation data	advertise availability of bldg. elevation data if we add layer	Public Info	Map Info	PPI	part of annual outreach mailout (332.a)
442.b	FM		FIRM maintenance	advertise availability of FIRM maintenance	Public Info	Map Info	PPI	part of annual outreach mailout (332.a)
542.d	SDR		Stream dumping regulations	PPI specify message and recommend best way to disseminate info advising citizens of Stream Dumping Ordinance (possibly amend annual mailout)	Public Info	Outreach / Education	PPI	part of annual outreach mailout (332.a)
352.c	WEB 1	x	for covering more than items in 330	items covered in 330, plus additional topics - maybe notes about items being at Library; other FEMA publications and where found?	Public Info	Outreach	PPI 4	update by November 30
352.c	WEB 2	x	for posting/linking real-time gage info	get w/Emergency Management District to get Links	Public Info	Outreach	PPI 4	update by November 30
352.c	WEB 3		for posting EC or EC data	If post EC's data as to BFE, elevation of structure/assessory equipment, adjacent grades, etc. - but not actual EC due to privacy laws	Public Info	Outreach	PPI 4	update by November 30
432.i	LDP		Local drainage protection	Outreach Project needed to remind everyone existing nurserymen ordinance and that effective (determine date), citations will be issued and fines levied for non-compliance	Public Info	Environmental Education / Outreach Project	PPI	Targeted Outreach Project by November 30 - needed to remind everyone of ordinance and that effective _____, citations will be issued and fines levied for non-compliance
332.b	FRP	x	Flood response preparation	create "Event Oriented" outreach - prepared in advance of event covering key messages that need to be disseminated before, during and after flood event)/adjusted annually to ensure info stays current (see table 330-1 on pg. 330-11) -other hazard types as well could be created - such as Tornado	Public Info	Outreach	PPI	2019- create additional advance materials for distribution immediately following an event

Prioritized Outreach Needs

Code Section Element No.	Acronym	PPI/FMP Comm.	Element Description	Range of Mitigation Actions Considered for Goals	Creditable Activity	Sub Category	GOAL #	Status Notes
332.d	STK	x	Stakeholder delivery	Contact any agency, organization or person (other than the community itself) that supports/initiates the message and is listed in the PPI plan. Schools that implement outreach activities; newspaper that publishes a flood or hurricane season supplement each year; neighborhood or civic association that sponsors/hosts a presentation by a community employee, utility company that includes pertinent articles in its monthly bills, insurance company that publishes a brochure on flood insurance (Ck what Red Cross might have produced) and obtain copies of what they distribute/how distributed/how often distributed - or see if they are willing to distribute info we create for both outreach and event oriented events	Public Info	Outreach	PPI	2019
342.a	DFH	x	Disclosure of the flood hazard	Ensure Real Estate Agents are informing potential purchasers of SFHA via property summary sheets, offer-to-purchase forms, Multiple Listing Service forms or others/whatever method it must state that property is in SFHA or not; it must tell inquirer that federal law requires flood insurance for federally backed mortgages -must specifically state that Flood Insurance is required; must be volunteered by the real estate office, not only when asked; seller's statement does not qualify, must state in SFHA not just whether or not seller experienced flood, must review real estate agents annually to evaluate and improve program	Public Info	Real Estate Disclosure	PPI	2019
342.c	REB	x	Real Estate agents' brochure	Talk w/local Agents and see if they would agree to handing out brochure that advises reader to check to see if property is in a flood zone (example: Brochure - Check before you buy: Know Your Flood Risk! see page 340-9 for sample language; also consider adding a small GIS flood map in brochure? - would show areas of SFHA, maybe even one w/drainage, street flooding, flash flooding, etc. layers on map) - We may have to provide to ensure they have/use? Determine how we could ensure compliance.	Public Info	Real Estate Disclosure	PPI	2019
442.c	BMM		Benchmark maintenance	advertise availability to surveyors and engineers	Public Info	Outreach	PPI	2019
512.b	RLAA	x	Repetitive loss area analysis	outreach to advise all properties they are in RL area (budget for postage/mailing); cannot list specific addresses in any public info - just areas - due to privacy act; include some Q/A info from meeting with homeowners' on Eddy St - as to X zone and RL status; notice to all properties of planning steps and must ask for their input on plan prior to adoption	Public Info	Outreach	PPI	2019 Needed on front end to let residents know why we are in area and on back end to review proposed plan prior to adoption
542.e	SBM		Storage basin maintenance	target facility owners of required maintenance/reporting requirements	Public Info	Outreach	PPI	2019

Prioritized Outreach Needs

Code Section Element No.	Acronym	PPI/ FMP Comm.	Element Description	Range of Mitigation Actions Considered for Goals	Creditable Activity	Sub Category	GOAL #	Status Notes
612.d	CFP		Critical facilities planning	Target an outreach for updated critical facilities advising them to make sure they keep info current and updated info sent to us	Public Info	Outreach	PPI	2019
632.b	DFR		Dam failure threat recognition system	Outreach to advise of testing quarterly?	Public Info	Outreach	PPI	2019
632.c	DFW		Dam failure warning	Heavy promotion provided for how the warning of potential dam failure will be disseminated to the public	Public Info	Environmental Education / Outreach Project	PPI	2019
632.c & 342.d	DFW & DOH		Dam failure warning/Disclosure of other hazards	heavy promotion for flood insurance on those currently in a flood inundation area	Public Invo	Outreach	PPI	2019
332.c	PPI	x	Program for Public Information	Establish a PPI Committee to Assess Public Info Needs; Formulate Messages; Identify Outreach projects to convey messages; examine other public information initiatives; prepare and adopt the PPI document; implement, monitor and evaluate the program	Public Info	Outreach	PPI	no outreach for the program itself

Code Section Element No. (choose appropriate element)	Acronym	Element Description	Range of Mitigation Actions Considered for Goals	Creditable Activity	Sub Category	GOAL #	Prioritized (1-5) 1 - Enact/Amd Ord In 2018; 2 - Activate in 2019; 3 - Activate w/in 5 yrs; 4 - Funding Source needs identifying 5 - Not Feasible at this time	Status Notes
432.f	PCF	Protection of critical facilities	Re-do (ck what's in Hazard Mitigation Plan for possible updated info?) - facilities vital to flood response or to the health/safety of public before, during and after a flood, such as hospital, EOC, electric substation, police/fire stations, nursing home, schools, public works, vehicle/equipment storage facilities or shelters; also hazardous material storage facility, power generation facility, water utility or wastewater treatment plant; prohibit in 100 & 500 year zone - partial credit if allowed in 500 yr but protection measures are required - prorated credit if only some types of facilities are covered in our regulations	Emergency Services	Critical Facility Protection	FMP 3	2	Committee authorized this to be done in conjunction with amendment to Multi-Hazard Mitigation Plan required early in 2019
612.d	CFP	Critical facilities planning	Get w/ Corey and see if we need to update: coordinating warning/response program with critical facilities; facilities must be listed in plan; contact w/facilities to determine any special warning arrangements; must receive credit in CFP1 for any credit, and additional credit for CFP2 if plans have been developed, reviewed or accepted for individual critical facilities (target an outreach for these facilities as to making sure they keep info current)	Emergency Services	Critical Facility Protection	FMP 3	2	Committee authorized this to be done in conjunction with amendment to Multi-Hazard Mitigation Plan required early in 2019 (see 612.Pre & get w/Corey @ Forrest County who is responsible for HMP update)
612.a	FTR	Flood Threat recognition system	Prediction system with arrival times. I don't know if the current system does this or not. I'll also be interested to hear from public works and water & sewer and parks & rec on flood response operations that are already in place. Also critical facilities planning. Need to obtain copies from each department of their emergency response plans.	Emergency Services		FMP 3	1	Mayor advised the Committee that this was currently underway - he put into motion upon hearing it was an identified action in a previous FMP meeting
422.h	NSP	Natural shoreline protection	Outdoor water spaces for recreation and river walks (reference existing plans/studies on Twin Forks, East Hardy, and Gordon's Creek)	Natural Resource Protection	Environmental Corridors	FMP 1	4	Committee agreed existing studies are worthwhile projects, but funding sources need to be found

422.h	NSP	Natural shoreline protection	Obtain inventory of all shorelines and what is natural vs hard surfaced (Hema has basic info, but we need to enhance) based on the length of shoreline affected by the natural shoreline protection regulations - setbacks and buffers do not qualify here, but do in OSP; programs that protect channels in their natural state are credited here - no concrete, rip rap, levees, etc. that constrains the natural process of the shoreline of the river, stream or lake	Natural Resource Protection	Environmental Corridors / Natural Area Preservation	FMP 1	2	see committee notes at 542.a - CDR
512.c	NFP	Natural floodplain functions plan	Create and adopt a plan that protects one or more natural functions: Examples: "Green" Infrastructure Plan; or section of Comprehensive Plan that includes inventory of ecological attributes of watershed and/or floodplain, recommends actions for protecting them and implemented through a grant, capital improvement plan or development regulation/order - extra credit in 420 if plan exists	Natural Resource Protection	Environmental Corridors / Natural Area Preservation	FMP 1	2	Committee authorizes staff to start this process and get cost estimates to outsource
422.h	NSP	Natural shoreline protection	Increase buffers along streams and rivers	Natural Resource Protection	Natural Area Preservation	FMP 1	3	Committee determined that when CDR inventory is completed, more study will be done on increasing buffers from current 25 foot to a larger footage along Rivers at least.
452.b	WMP5	Watershed Master Plan: Natural areas to provide retention and detention	additional credit if plan identifies existing wetlands or other natural open space areas to be preserved from development to that natural attenuation, retention, or detention of runoff is provided	Natural Resource Protection	several apply - choose one	FMP 1	2 / 3	*see notes as WMP1
452.b	WMP6	Watershed Master Plan: Prohibit alteration of existing natural channels	additional credit if the plan recommends prohibiting development, alteration or modification of existing natural channels and the community has adopted a qualifying ordinance	Natural Resource Protection	several apply - choose one	FMP 1	2 / 3	*see notes as WMP1
452.b	WMP7	Watershed Master Plan: Projects must use natural of "Soft" approaches	additional credit if the plan recommends that channel improvements use natural or "soft" approaches rather than gabions, rip rap, concrete, or other "hard" techniques, and the community has adopted appropriate design standards or ordinances	Natural Resource Protection	several apply - choose one	FMP 1	2 / 3	*see notes as WMP1

422.g	LZ	Low Density	Revise setbacks in existing lots in SFHA that are not of typical sizing - may create more low-density areas by doing so	Preventive	Planning and Zoning	FMP 1	2	Committee determined there were many "odd" shaped lots in SFHA and authorized staff to inventory and determine if zoning/setbacks of any could be revised (possibly some lower density established) and create regulation/policy for allowing different setbacks from standard zoning for the lots that cannot currently comply for development based on size/shape of lot
432.i	LDP	Local drainage protection	We currently have an ordinance that prohibits nurserymen from blowing yard debris into the streets and/or drains, we need stricter enforcement and fines assessed to eliminate this.	Preventive	Drainage System Maintenance	FMP 1	1	Committee authorized staff to enforce ordinance, even with City crews, and all appropriate staff are notified to enforce with the public after an Outreach Project is done on this item (check w/City Attorney as to whether or not Public Works can issue violations or just Police / Code Enforcement)
432.i	LDP	Local drainage protection	If the containerization ordinance does not prohibit residential property owners from blowing debris into the streets, can we create an ordinance similar to the nurserymen ordinance. Also address other businesses, such as concrete trucks washing down trucks into drains – this is a real problem.	Preventive	Drainage System Maintenance	FMP 1	2	Committee authorized staff to review current regulations and enhance/revise as needed
542.a	CDR	Channel Debris Removal	Inventory and map all channels in SFHA (or City-wide?), all USGS quadrangle and draining more than 40 contributing acres; large underground segments of the surface conveyance system need to be shown if they convey flow from a natural channel; on the map and inventory segments, portions or components of natural conveyance system must be identified; identify owner (city, state, private); and who inspects and maintains each segment	Preventive	Drainage System Maintenance	FMP 1	2	Lamar (Engineer) said we could do as much as possible using Google Earth or other available data; and site inventory of other areas as needed to complete project (this project will include 542.b - PSM, 422.h - NSP, and 542.b - PSM) Send all code requirements to Jerald in Engineering to start this process
542.d	SDR	Stream dumping regulations	Post signs at all problem sites (check costs)	Preventive	Drainage System Maintenance	FMP2	1	Committee authorized at all problem sites; get w/Public Works & Recreation depts to identify areas
?		RLAA or 520?	Prepare a comprehensive inventory of housing in the floodplain by quality (dilapidated, elevated, good standing, etc.)	Preventive	Floodplain Mapping and Data	FMP 1	3	Committee agreed this would give more accurate ratio counts for those activities based on building counts; and is probably a part of the RLAA study area

322.c	MI3	Other flood problems not shown on the FIRM	Have Public Works review entire list of Known Hazard Areas and report possible solutions	Preventive	Floodplain Regulations	FMP 1	2	Committee determined Public Works should begin reviewing immediately, but due to volumn it may take up to a year to complete review, perform projects to solve as budgets allow, and report on unsolvable and/or budget needs to complete
322.c & 412.d or 432.0	MI3 & HHS/ OHS	Other flood problems not shown on the FIRM/ Other Higher Standard/Higher Study Standard	Determine if we want to regulate unsolvable as if in a special flood hazard area, requiring freeboard elevation - if so, send to FEMA for map amendment, adding these areas to the SFHA?	Preventive	Floodplain Regulations	FMP 0	5	Committee did not want to make our SFHA larger; would rather review other options for those that cannot be resolved with a drainage project
412.a, 412.d, 432.0 or 422.f	NS/HSS/ OHS/OSI	New Study/Higher study standards/Other Higher Standard/Open Space Incentive	Amend LDC and/or Flood Prevention Ordinance requiring all structures in a new Flood Inundation Area (established on State/Fed Permits) to be elevated to established Freeboard; map area and possibly submit to FEMA for map amendment OR just allow for "cluster" development whereby the inundation area stays green and allows the structures to be placed in/around but not in danger area or both options combined	Preventive	Floodplain Regulations	FMP 1	1	Committee agreed that we have "Cluster" Development Standards in our LDC already, and authorized amendment to Flood Prevention Ordinance to require the use of the existing LDC standard and prohibit structures in the inundation area; submittal to Council for adoption and heavy outreach on flood insurance promotion to existing structures that would fall within an inundation area, but outside of the new development (see PPI outreach in Section 630)
412.d or 432.0	HSS or OHS	Higher study standards or Other Higher Standard	Amend LDC and/or Flood Prevention Ordinance to require new subdivisions with a dam to meet all the State and Federal requirements/obtain permits prior to local permitting.	Preventive	Floodplain Regulations	FMP 1	1	Committee authorized amendment to Flood Prevention Ordinance to require; submittal to Council for adoption
432.a1	DL1	Prohibition of fill	Long Shot - would need ordinance language that prohibits fill; however, gives approx. 1/2 credit if developer provides compensatory storage which might be a good compromise?	Preventive	Floodplain Regulations	FMP 0	5	Committee was against prohibiting development
432.a2	DL2	Prohibition of buildings	Don't recommend at this time - Twin Forks development would be out if we adopted ordinance language that prohibits building	Preventive	Floodplain Regulations	FMP 0	5	Committee was against prohibiting development
432.a3	DL3	Prohibition of outdoor storage of materials	Need to identify what hazardous materials and amend ordinance language to prohibits all materials; other options: partial credit for only hazardous materials indoors or outdoors, or only indoors, but elevated	Preventive	Floodplain Regulations	FMP 0	5	Committee was against prohibiting development and had many outdoor storage facilities of one type or another existing

432.b	FRB	Freeboard	Increase our Freeboard to 2, 2 1/2 or 3 foot; Also need to ensure ordinance states that all utilities including ductwork are elevated as well. (If we change from 1 ft to 1 1/2 feet we get credit for 2 feet and benefits home owner in rates - but need to determine if cost effective)	Preventive	Floodplain Regulations	FMP 1	3	Committee wants to study more - too many pros/cons to make determination at this time
432.g	ENL	Enclosure limits	Amend Ord from 300 to 299 to meet new regulation - check for other need changes and verify all language as to non-conversion agreements are in ordinance per new regulations	Preventive	Floodplain Regulations	FMP 1	1	Committee authorized amendment to Flood Prevention Ordinance as outlined
432.g	ENL	Enclosure limits	Amend Ord to prohibit all enclosures for maximum credit	Preventive	Floodplain Regulations	FMP 1	3	Committee will revisit after more study on need over the next few years
432.i or 432.o	LDP or OHS	Local drainage protection or Other Higher Standard	All streets in City elevated above BFE - would it create "bowl" effect on property?	Preventive	Floodplain Regulations	FMP 0	5	Committee said too costly
432.o	OHS	Other Higher Standard	New streets in FP to be built at or above BFE.	Preventive	Floodplain Regulations	FMP 0	5	Committee said too costly
432.o	OHS	Other Higher Standard	Amend Flood Prevention Ordinance to prohibit floodproofing as a flood protection measure for ALL new buildings (we currently allow for commercial structures) (means all residential and commercial structures in a SFHA would have to be elevated to established freeboard)	Preventive	Floodplain Regulations	FMP 1	1	Committee authorized amendment to Flood Prevention Ordinance to prohibit; submittal to Council for adoption
422.g	LZ	Low-density zoning	When the city acquires property in a flood zone, we could also pursue lower density zoning if/when the lot size is appropriate or if we can assemble multiple properties for the purpose.	Preventive	Planning and Zoning	FMP 1	2	Committee wanted to review on a case-by-case basis, so create a policy resolution to outline the process; submittal to Council for adoption
432.o	OHS	Other Higher Standard	No new septic tanks in floodplains or flood zones.	Preventive	Planning and Zoning	FMP 0	5	Committee acknowledged that there are several existing and may need for any annexed areas, so not at this time
432.o	OHS	Other Higher Standard	Amend LDC to require an evacuation plan for new residential subdivisions that exceed a certain number of units/street (designate number of minimum units)	Preventive	Planning and Zoning	FMP 3	2	Committee authorized amendments to Land Development Code for larger subdivisions with multiple streets; submittal to Council for adoption
512.a3	FMP 3	FMP - Step 3 Coordinate	Reference all projects (existing/proposed) to current Comprehensive Plan 2008-2028 (Especially the Action Plan items)	Preventive	Planning and Zoning	FMP 1	2	Committee agreed that the Comp Plan needs to be fully utilized in all projects the City pursues

512.a3	FMP 3	FMP - Step 3 Coordinate	Develop partnerships with local universities for future studies (Just to name a few: master planning, economic development, architectural/site analysis, environmental/health studies, etc.)	Preventive	Planning and Zoning	FMP 5	2	Committee authorized staff to pursue possibilities
512.a3	FMP 3	FMP - Step 3 Coordinate	Continue coordination with Forrest/Lamar Counties, City of Petal, and state agencies for joint projects	Preventive	Planning and Zoning	FMP 5	2	Have had multiple meetings that would give some credit now; but utilize for future projects when applicable
?			Re-establish Tree Ordinance	Preventive	Planning and Zoning (could also apply to others)	FMP 1	1	Committee agreed need to re-establish (inadvertently ommitted when new LDC was done); Determine what Element would apply and review draft Ord.; submit to Council for adoption in November
452.a	SMR	Stormwater management regulations	Consider amending our ord for new developement to prevent/reduce the increase in runoff that results from urbanization from 10-year storm or larger. Must have watershed map w/total areas and calculate the area of watershed and area subject to regulations (portion in City limits for example) is part of the impact adjustment for this activity - Additional credit is available if the community addresses larger storms, and controls the total volume of runoff from new development, and broken down into 4 categories below (must have SZ and DS credit to receive any credit for SMR):	Preventive	Stormwater Management	0	5	Lamar (City Engineer) said we should not change at this time
452.a1	SZ	Size of Development regulated	Consider amending our Ord. to add regulations that clearly state ALL development is subject to regulations (prorated if only some types or sizes of development are regulated). A portion of watershed must be subject to a regulation that requires peak runoff from new development to be no greater than the runoff from the site in its pre-development condition and at a minimum regulate development of 5 acres or more or increases in impervious area of 20,000 sq. ft or more - do we also want to amend Ord to cover smaller areas?	Preventive	Stormwater Management	0	5	Lamar (City Engineer) said we should not change at this time

452.a2	DS	Design Storms used in regulations	Consider amending - Max credit if regulations clearly state that all discharges up to and including that from the 100-yr storm must be released at rates not exceeding the pre-development peak discharge - bonus credit for controlling the volume of runoff if regulations require retention of all runoff or if the total volume of water released, measured above half of the 2-year flow rate is no more than the pre-development volume - credit is for what size storm detention is designed for and additional credit if the volume is also controlled	Preventive	Stormwater Management	0	5	Lamar (City Engineer) said we should not change at this time
452.a4	PUB	Public maintenance of required facilities	Establishing and enforcing maintenance procedures and City having authority to inspect, perform maintenance should owners not comply -	Preventive	Stormwater Management	FMP 1	2	Lamar (Engineer) has already drafted an update and sent to Ginger (Planner)- see if it will be
452.b	WMP2	Watershed Master Plan: Manage all storms up to and including the 100 year	additional credit if managing the runoff from "all storms" up to and including the 100-yr event to ensure that flood flows downstream of new development do not increase due to the development	Preventive	Stormwater Management	FMP 1	2 / 3	*see notes as WMP1
452.b	WMP3	Watershed Master Plan: Management of future peak flows and volumes	additional credit if plan provides onsite management of future peak flows and volumes so that they do not increase over present values	Preventive	Stormwater Management	FMP 1	2 / 3	*see notes as WMP1
452.b	WMP4	Watershed Master Plan: Manage all storms up to and including the 5-day event	additional credit if plan manages the runoff from "all storms" up to and including the 5-day event	Preventive	Stormwater Management	FMP 1	2 / 3	*see notes as WMP1
452.b	WMP8	Watershed Master Plan: Dedicated funding source to implement the plan	additional credit if the community has a funding source dedicated to implementing the plan's recommendations	Preventive	Stormwater Management	FMP 1	2 / 3	*see notes as WMP1
542.b	PSM	Problem site maintenance	Inventory and Map problem site maintenance locations (ex. "choke" points, chronic dumping, obstruction of flows or erosion/sedimentation problems , etc.) in all channels in SFHA (or City wide?)- set up more frequent inspections for better maintenance of these areas and identify in resolution	Preventive	Drainage System Maintenance	FMP 1	2	see notes at 542.a - CDR

422.b	DR	Deed Restrictions	do we want to place deed restrictions on any City owned vacant property we plan to keep? - see if we can contact State and work something out with the to place on State owned as well?	Preventive & Natural Resource protection	Open Space Preservation / Natural area restoration, others	FMP 0	5	Committee did not want to lock us in w/deed restriction at this time
422.b	DR	Deed Restrictions	If/when the city acquires and/or assembles property, consider a policy for a percentage that is to be set aside as perpetual open space, but no deed restriction.	Preventive & Natural Resource protection	Open Space Preservation / Natural area restoration, others	FMP 1	2	Committee said prefers to review on a case-by-case basis; create a policy resolution outlining the process; submit to Council for adoption; See if we would get any points since we are not restricting, possibly some prorated in Higher Standard
452.b	WMP1	Watershed Master Plan: Plan meets all the criteria listed in Sec 452.b	Consider amending Stormwater Ordinance to add a Watershed Master Plan as broken down in WMP1-8 and all the requirements here: must have stormwater regulations through an adopted watershed master plan that evaluates the impact of future conditions for at least one watershed that drains into the community for multiple storm events, including the 100-yr storm; must identify the natural drainage system and constructed channels; must have adopted regulatory standards that require onsite management of runoff from all storms up to and including the 25-yr event that receive credit under SMR and manage future peak flows; "all storms" includes at a min. the 10-yr storm in addition to 25 yr. event; management of a 2-yr storm is recommended; plan must be current (within 5 yrs.) or City must evaluate the plan toe ensure still applicable to current conditions	Preventive and possibly Natural Resource Protection	Stormwater Management	FMP 1	2 / 3	Committee determined plan could be done in phases, prioritized by most developed watershed - starting with Gordon's Creek as Phase I in 1-2 years and the others within 3-5 years (this applies to WMP1 - WMP-8)
432.o	OHS	Other Higher Standard	Require evacuation plans if/when neighborhoods include flood zones (assuming the element only applies to those in a flood zone). Check Regs for clarity - may be something simple to add w/LDC change - Make sure Mayor okay if we do	Preventive or Emergency Services	Planning and Zoning or Health and Safety Maintenance	FMP 3	3	Committee will study for possible future adoption

432.i	LDP	Local drainage protection	Mill streets when repaving, so that drains are not partially covered by new street layer	Preventive or Structural	Drainage System Maintenance or Storm Drain Improvements	FMP 1	1	Mayor said would be put in motion immediately
512.b	RLAA	Repetitive loss area analysis	detailed mitigation plan for RL area, specific guidance on how to reduce damage; see if any have been mitigated/removed; must address every address in the RL area; area mapped; contact other agencies for input, visit each building and collect basic data - drainage patterns, condition of structure, types of foundation; historic flood info; date of bldgs. ins claim and source of flooding; RLAA info must be adopted by Council separately	Property Protection	Acquisition/Relocation/Retrofitting?	FMP 1	2	Committee authorized staff to start this process early next year, including "Structural" and "Public Info" in same section
532.a 1a; 532.b; 532.c & 533	TUE, FPI, (including FPP/FPB), PB and Option 1 or 2 of Credit Calculations	Flood Protection Project Technique Used	Revolving loan fund for elevating structures in the flood zone Criteria could be income, personal funds, need of the structure, limitations on reinvestment due to value of structure("substantial improvement", County tax assessment), must be in designated flood zone. Could be set up through local non-profit or foundation for management at a zero or low interest. Benefits of elevating through this fund include: 1. Improve safety of the structure by reducing the flood risk 2. Lower flood insurance costs by elevating structure 3. Keeps people in their communities, many of which are historic or established through multiple generations 4. Allows increased investment in a structure by property owners 5. Allows increased investment in a neighborhood overall by eliminating the "substantial improvement" limitation. 6. Requiring work to be done by a "local" contractor would keep the investment in the community. Could also require the work to be done by independently owned companies, minority owned companies, etc.	Property Protection	Building Elevation / Retrofitting	FMP 1	4	Committee authorized staff to research and find a funding source for this project. The agencies identified that may help with this sort of project are: Area Development Partnership (ADP), Recover, Rebuild, Restore South Mississippi (R3SM), a City's Community Development Block Grant (CDBG) Program (doesn't currently handle flood properties, but get with Director and see if that policy could be amended - their funds are very limited however, so other sources would be better)

532.a 1a; 532.b; 532.c & 533	TUE, FPI, (including FPP/FPB), PB and Option 1 or 2 of Credit Calculations	Flood Protection Project Technique Used	Tax Abatement – Attempted but denied by State. Will keep searching for other alternatives.	Property Protection	Building Elevation / Retrofitting	FMP 1	4	Mayor's administrative staff will continue to pursue
532.a 2b	TUF	Structural Flood Control Technique	Take large areas of city land and consider retention basins	Structural	Reservoirs	FMP 1	2	Committee agreed there is a great need and authorized for Engineering to pursue as they see
542.b	PSM	Problem site maintenance	Identify possible resolutions to any problem sites (ex: "choke" points, chronic dumping, obstruction of flows or erosion/sedimentation	Structural	Storm Drain Improvement	FMP 1	2	see notes at 542.a - CDR
512.b	RLAA	Repetitive loss area analysis	If we determine whether any property protection or drainage improvements are feasible (see list of approved measures on page 360-2 and 510-20; document findings; summary of process that was followed;	Structural Project	Storm Drain Improvements?	FMP 1	2	see "Property Protection" notes in same Section

PROPOSED GOALS - STEP 6

Code Section Element No.	Acronym	Element Description	PPI/FMP Committee	Creditable Activity	Sub Category	Step 6	
						Goal # (see Legend sheet)	Range of Mitigation Actions Considered for Goals
322.c & 432.0 or 412.d	MI3 & OHS/ HHS	Other flood problems not shown on the FIRM/ Other Higher Standard/Higher Study Standard		Preventive	Floodplain mapping and data		ongoing, but need to update "Known Flood Hazard Map" based on FMP input in step 4
322.d	MI4	Flood depth data		Preventive	Floodplain mapping and data		see if maybe EMD/NOAA has more info or just use Inundation Maps
322.f	MI6	Historical Flood Information		Preventive	Floodplain mapping and data		Example: past flooding, high-water marks or repetitive loss areas (include dates, injuries, warning times) - if too much on one map in MI2 could maybe have maps of the RL areas printed and handed out when a request that is in that area is received, wouldn't cause a lot more work, would just have to remember to add
322.g	MI7	Natural floodplain functions		Preventive	Floodplain mapping and data		add layer for designated wetlands (USGS? Map) or critical habitat areas
442.a	AMD01	Additional Map Data: SFHA, corporate limits, streets & lot boundaries		Preventive	Floodplain mapping and data		must provide sample of SFHA, corporate limits, streets & lot boundaries
442.a	AMD02	Additional Map Data: buildings, building outlines or footprints		Preventive	Floodplain mapping and data		must provide sample of buildings, building outlines or footprints map layer
442.a	AMD03	Additional Map Data: floodways		Preventive	Floodplain mapping and data		must provide sample of floodway data
442.a	AMD04	Additional Map Data: base flood elevations		Preventive	Floodplain mapping and data		if we don't have on FIRM, we could use EC forms data to add this layer for partial credit (but not the actual certificate - see "Web" notes as to privacy act and what to include
442.a	AMD05	Additional Map Data: FIRM zone attributes		Preventive	Floodplain mapping and data		must provide sample of FIRM zone attributes
442.a	AMD06	Additional Map Data: 500-year floodplain elevations or boundaries		Preventive	Floodplain mapping and data		must provide sample of 500-year floodplain elevations or boundaries
442.a	AMD07	Additional Map Data: other natural hazards		Preventive	Floodplain mapping and data		must provide sample of other natural hazards

PROPOSED GOALS - STEP 6

Code Section Element No.	Acronym	Element Description	PPI/FMP Committee	Creditable Activity	Sub Category	Step 6	
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442.a	AMD08	Additional Map Data: topographic contour lines		Preventive	Floodplain mapping and data		must provide sample of topographic contour lines
442.a	AMD10	Additional Map Data: old FIRM's		Preventive	Floodplain mapping and data		we have pictures of oldest ones taken at McCain Library where archived and stored; and latest 2 or 3 are stored in Planning and Engineering (Jerald has) Offices - could possibly add as layers, ask Hema what kind of time this would take, may not be worth 6 points
442.a	AMD11	Additional Map Data: other regulations		Preventive	Floodplain mapping and data		update and map repetitive loss areas and any HAZUS-MH layers
442.a	AMD12	Additional Map Data: Natural floodplain functions		Preventive	Floodplain mapping and data		update and map wetlands and area near Currie St/E Hardy St if we designate as Natural area restoration
442.a	AMD13	Additional Map Data: building elevation data		Preventive	Floodplain mapping and data		bldg. elevation data - could use EC forms data to add this layer (but not the actual certificate - see "Web" notes as to privacy act and what to include - or building/subdivision plans?
442.b	FM	FIRM maintenance		Preventive	Floodplain mapping and data		as stated in AMD11 we have all the maps w/the 2 latest issues readily available
452.c	ESC	Erosion and sedimentation control regulations		Preventive	Planning and Zoning		city must require that erosion/sediment control measures be taken on land disturbed during development, based on size of area and applied to all construction sites - including construction of bldgs., road's etc.
452.d	WQ	Water quality regulations		Preventive	Planning and Zoning		city must implement best management practices to protect water quality and regulations must specify one or more measures or refer to BMP's as published in an official government reference
312.a	EC	Maintaining Elevation Certificates		Property Protection	Building Elevation		ongoing, but need better communication between building/planning depts to ensure accuracy of EC's and structure elevation - especially at the "Building Under Construction" Level before slabs are poured
372.a	FIA	Flood Insurance coverage assessment	x	Property Protection	Insurance		assessing the community's current level of flood ins coverage/where can be improved; incorporating element into PPI or 510 is recommended; Collect flood insurance info; Determine level of flood ins coverage; Prepare document; Submit to governing body, and Reassess every 5 years at a minimum

PROPOSED GOALS - STEP 6

Code Section Element No.	Acronym	Element Description	PPI/FMP Committee	Creditable Activity	Sub Category	Step 6	
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372.b	CP	Coverage Improvement Plan	x	Property Protection	Insurance		2nd step in flood ins promotion - prepare plan to improve coverage needs found in FIA; incorporate in the PPI - could be a sub-committee of the PPI (prerequisite is FIA credit)
372.c	CPI	Coverage Improvement Plan Implementation	x	Property Protection	Insurance		3rd step in flood ins promotion - implementing the plan to improve coverage; incorporate ways to do this in PPI
322.c & 432.0 or 412.d	MI3 & OHS/ HHS	Other flood problems not shown on the FIRM/ Other Higher Standard/Higher Study Standard		Public Info	Outreach		ongoing, but need to update "Known Flood Hazard Map" based on FMP input in step 4 - see "Preventive" possibly a new regulation will be added?
322.d	MI4	Flood depth data		Public Info	Outreach/Map Info		advertise availability
322.f	MI6	Historical Flood Information		Public Info	Outreach/Map Info		advertise availability
322.g	MI7	Natural floodplain functions		Public Info	Outreach/Map Info		advertise availability
332.a	OP	Outreach Projects	x	Public Info	Outreach		update our current brochure and find other sources for distribution of info (see stakeholder delivery); maybe create brochure, etc. in English and Spanish

PROPOSED GOALS - STEP 6

Code Section Element No.	Acronym	Element Description	PPI/FMP Committee	Creditable Activity	Sub Category	Step 6	
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332.b	FRP	Flood response preparation	x	Public Info	Outreach		create "Event Oriented" outreach - prepared in advance of event covering key messages that need to be disseminated before, during and after flood event)/adjusted annually to ensure info stays current (see table 330-1 on pg. 330-11) -other hazard types as well could be created - such as Tornado
332.c	PPI	Program for Public Information	x	Public Info	Outreach		Establish a PPI Committee to Assess Public Info Needs; Formulate Messages; Identify Outreach projects to convey messages; examine other public information initiatives; prepare and adopt the PPI document; implement, monitor and evaluate the program
332.d	STK	Stakeholder delivery	x	Public Info	Outreach		Contact any agency, organization or person (other than the community itself) that supports/initiates the message and is listed in the PPI plan. Schools that implement outreach activities; newspaper that publishes a flood or hurricane season supplement each year; neighborhood or civic association that sponsors/hosts a presentation by a community employee, utility company that includes pertinent articles in its monthly bills, insurance company that publishes a brochure on flood insurance (Ck what Red Cross might have produced) and obtain copies of what they distribute/how distributed/how often distributed - or see if they are willing to distribute info we create for both outreach and event oriented events
342.a	DFH	Disclosure of the flood hazard	x	Public Info	Real Estate Disclosure		Ensure Real Estate Agents are informing potential purchasers of SFHA via property summary sheets, offer-to-purchase forms, Multiple Listing Service forms or others/whatever method it must state that property is in SFHA or not; it must tell inquirer that federal law requires flood insurance for federally backed mortgages - must specifically state that Flood Insurance is required; must be volunteered by the real estate office, not only when asked; seller's statement does not qualify, must state in SFHA not just whether or not seller experienced flood, must review real estate agents annually to evaluate and improve program
342.b	ODR	Other disclosure requirements	x	Public Info	Outreach/Insurance		add to outreach any verified in "Preventive" on this activity

PROPOSED GOALS - STEP 6

Code Section Element No.	Acronym	Element Description	PPI/FMP Committee	Creditable Activity	Sub Category	Step 6	
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342.c	REB	Real Estate agents' brochure	x	Public Info	Real Estate Disclosure		Talk w/local Agents and see if they would agree to handing out brochure that advises reader to check to see if property is in a flood zone (example: Brochure - Check before you buy: Know Your Flood Risk! see page 340-9 for sample language; also consider adding a small GIS flood map in brochure? - would show areas of SFHA, maybe even one w/drainage, street flooding, flash flooding, etc. layers on map) - We may have to provide to ensure they have/use? Determine how we could ensure compliance.
342.d & 632.c	DOH / DFW	Disclosure of other hazards/Dam Failure Warning		Public Info	Outreach		only one that would apply to us is possibly Dam or Levee Failure - others are Coastal (see proposed outreach project in 632.c)
352.a	LIB	Flood protection library		Public Info	Library		advising of the publications on hand at the library (9 required publications (see list in table 350-1 on page 350-3) housed/cataloged in Library - get updated letters from H'burg, USM both Cook/McCain library's; check w/Wm Carey and Lamar County and see if they have info or will add as well)
352.b	LPD	Locally pertinent documents		Public Info	Library		advise public of other items such as Flood Insurance Study, Hazard Mitigation Plan, Floodplain Management Plan and/or Ordinance, FIRM (1 point for each document) on hand at the library
352.c	WEB 1	for covering more than items in 330	x	Public Info	Outreach		items covered in 330, plus additional topics - maybe notes about items being at Library; other FEMA publications and where found?
352.c	WEB 2	for posting/linking real-time gage info	x	Public Info	Outreach		get w/Emergency Management District to get Links

PROPOSED GOALS - STEP 6

Code Section Element No.	Acronym	Element Description	PPI/FMP Committee	Creditable Activity	Sub Category	Step 6	
						Goal # (see Legend sheet)	Range of Mitigation Actions Considered for Goals
352.c	WEB 3	for posting EC or EC data		Public Info	Outreach		If post EC's data as to BFE, elevation of structure/assessory equipment, adjacent grades, etc. - but not actual EC due to privacy laws
362.a	PPA	Property Protection Advice	x	Public Info	Outreach		Advertise City gives 1 on 1 advise to property owners re: protection; City must identify 1 or more persons to give info; can be combined staff per their expertise (technical qualifications need to be provided); must be publicized annually (3 options: 1 to everyone; notice to affected areas; or PPI element provided the program identifies the audience for the service and discusses best way to reach said audience); records must be kept (memos, E-Mails, letters, etc., and include date and type of assistance given, details of findings and recommendations provided to inquirers; PPI must identify annually the effectiveness, and any changes recommended for improving effectiveness
362.b	PPV	Protection Advice provided after a site visit	x	Public Info	Outreach		Make sure we do and if so advertise - this is additional credit if advice in PPA above is given on site instead of in staff office; publicize service; PPA credit must include a discussion to the site visits and how they should be conducted; detailed records as in PPA
362.c	FAA	Financial assistance advice	x	Public Info	Outreach		Make sure we do and if so advertise - See list of Financial Assistance in Table 360-2, on page 360-8; publicized annually; 1 on 1; staff identified; records kept; PPI must include discussion of the service and recommendations on how should be conducted
372.a	FIA	Flood Insurance coverage assessment	x	Public Info	Outreach Project		Amend outreach materials to advertise this assessment - exampes are on-line
372.b	CP	Coverage Improvement Plan	x	Public Info	Outreach Project		Amend outreach materials to advertise this plan

PROPOSED GOALS - STEP 6

Code Section Element No.	Acronym	Element Description	PPI/FMP Committee	Creditable Activity	Sub Category	Step 6	
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372.c	CPI	Coverage Improvement Plan Implementation	x	Public Info	Outreach Project		Amend outreach materials to advertise how plan will be implemented
372.d	TA	Technical Assistance.	x	Public Info	Outreach/Technical Assistance		publicized annually; 1 on 1 w/citizen; qualified staff identified; records kept; PPI must include discussion of the service and recommendations on how should be conducted; FIA, CP and CPI are not required for this credit, but if plan is done, it must discuss providing technical assistance as a way to encourage people to purchase, maintain or improve their coverage
442.a	AMD01	Additional Map Data: SFHA, corporate limits, streets & lot boundaries		Public Info	Map Info		advertise availability of SFHA, corporate limits, streets & lot boundaries
442.a	AMD02	Additional Map Data: buildings, building outlines or footprints		Public Info	Map Info		advertise availability of buildings, building outlines or footprints
442.a	AMD03	Additional Map Data: floodways		Public Info	Map Info		advertise availability of floodway data

PROPOSED GOALS - STEP 6

Code Section Element No.	Acronym	Element Description	PPI/FMP Committee	Creditable Activity	Sub Category	Step 6	
						Goal # (see Legend sheet)	Range of Mitigation Actions Considered for Goals
442.a	AMD04	Additional Map Data: base flood elevations		Public Info	Map Info		advertise availability of BFE's
442.a	AMD05	Additional Map Data: FIRM zone attributes		Public Info	Map Info		advertise availability of FIRM zone attributes
442.a	AMD06	Additional Map Data: 500-year floodplain elevations or boundaries		Public Info	Map Info		advertise availability of 500-year floodplain elevations or boundaries
442.a	AMD07	Additional Map Data: other natural hazards		Public Info	Map Info		advertise availability of other natural hazards
442.a	AMD08	Additional Map Data: topographic contour lines		Public Info	Map Info		advertise availability of topographic contour lines

PROPOSED GOALS - STEP 6

Code Section Element No.	Acronym	Element Description	PPI/FMP Committee	Creditable Activity	Sub Category	Step 6	
						Goal # (see Legend sheet)	Range of Mitigation Actions Considered for Goals
442.a	AMD09	Additional Map Data: floodplain data in the tax assessment data base		Public Info	Map Info		advertise availability if County has floodplain data in the tax assessment data base
442.a	AMD10	Additional Map Data: old FIRM's		Public Info	Map Info		advertise availability of old FIRM's
442.a	AMD11	Additional Map Data: other regulations		Public Info	Map Info		advertise availability of repetitive loss areas and any HAZUS-MH layers that we can utilize
442.a	AMD12	Additional Map Data: Natural floodplain functions		Public Info	Map Info		advertise availability of wetlands and area near Currie St/E Hardy St if we designate as Natural area restoration
442.a	AMD13	Additional Map Data: building elevation data		Public Info	Map Info		advertise availability of bldg. elevation data if we add layer

PROPOSED GOALS - STEP 6

Code Section Element No.	Acronym	Element Description	PPI/FMP Committee	Creditable Activity	Sub Category	Step 6	
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442.b	FM	FIRM maintenance		Public Info	Map Info		advertise availability of FIRM maintenance
442.c	BMM	Benchmark maintenance		Public Info	Outreach		advertise availability to surveyors and engineers?
512.b	RLAA	Repetitive loss area analysis	x	Public Info	Outreach		outreach to advise all properties they are in RL area (budget for postage/mailing); cannot list specific addresses in any public info - just areas - due to privacy act; notice to all properties must ask for input on plan,
542.d	SDR	Stream dumping regulations		Public Info	Outreach / Education		PPI specify message and recommend best way to disseminate info advising citizens of Stream Dumping Ordinance (possibly amend annual mailout)
542.e	SBM	Storage basin maintenance		Public Info	Outreach		target facility owners of required maintenance/reporting requirements

PROPOSED GOALS - STEP 6

Code Section Element No.	Acronym	Element Description	PPI/FMP Committee	Creditable Activity	Sub Category	Step 6	
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632.b	DFR	Dam failure threat recognition system		Public Info	Outreach		Outreach to advise of testing quarterly?
632.c	DFW	Dam failure warning		Public Info	Environmental Education / Outreach Project		Heavy promotion provided for how the warning of potential dam failure will be disseminated to the public
612.d	CFP	Critical facilities planning		Public Info	Outreach		Target an outreach for updated critical facilities advising them to make sure they keep info current and updated info sent to us
632.c & 342.d	DFW & DOH	Dam failure warning/Disclosure of other hazards		Public Invo	Outreach		heavy promotion for flood insurance on those currently in a flood inundation area

PROPOSED GOALS - STEP 6

Code Section Element No.	Step 7									Step 8			
	PROS	CONS	Projects currently ongoing - meeting expectations - specify status	Projects currently oning - needs modifying - specify proposed modification & why	New project which could be accomplished with current staff (including FMP/PPI Committees)	New project which would require additional staff (specify estimated annual cost)	Projects that can be accomplished with current budgets	Projects that would require budgeting additional funds (specify estimated project cost)	Specify if funding needed is for one-time or long term	Prioritized (1-5) 0 - Nick/Lisa to complete 1 - Enact/Amd Ord In 2018; 2 - Activate in 2019; 3 - Activate w/in 5 yrs; 4 - Funding Source needs identifying 5 - Not Feasible at this time	Who is Responsible for Implementing	When It Will be Done	How It will be funded
322.c & 432.0 or 412.d			-	-	Map updated and map layer added to distributed map	-	X	-	-	0	Planning/GIS	prior to Nov 2018	current budget / staffing
322.d			-	Re-establish receiving monthly reports from NOAA & map as needed - rainfall amounts/depth	-	-	X	-	-	0	Planning/GIS	prior to Nov 2018	current budget / staffing
322.f			-	-	add to the info dirstirbuted to property flood request	-	X	-	-	0	Planning/GIS	prior to Nov 2018	current budget / staffing
322.g			-	-	add to the info dirstirbuted to property flood request	-	X	-	-	0	Planning/GIS	prior to Nov 2018	current budget / staffing
442.a			-	see breakdown in AMD02 - AMD13	-	-	X	-	-	1	Planning/GIS	prior to Nov 2018	current budget / staff
442.a			-	see if we can get better info	-	-	X	-	-	1	Planning/GIS	prior to Nov 2018	current budget / staff
442.a			X	-	-	-	X	-	-	1	Planning/GIS	prior to Nov 2018	current budget / staff
442.a			-	-	add from EC data	-	X	-	-	1	Planning/GIS	prior to Nov 2018	current budget / staff
442.a			X	-	-	-	X	-	-	1	Planning/GIS	prior to Nov 2018	current budget / staff
442.a			X	-	-	-	X	-	-	1	Planning/GIS	prior to Nov 2018	current budget / staff
442.a			-	-	add newly identified known flood hazard areas	-	X	-	-	1	Planning/GIS	prior to Nov 2018	current budget / staff

PROPOSED GOALS - STEP 6

Code Section Element No.	Step 7									Step 8			
	PROS	CONS	Projects currently ongoing - meeting expectations - specify status	Projects currently oning - needs modifying - specify proposed modification & why	New project which could be accomplished with current staff (including FMP/PPI Committees)	New project which would require additional staff (specify estimated annual cost)	Projects that can be accomplished with current budgets	Projects that would require budgeting additional funds (specify estimated project cost)	Specify if funding needed is for one-time or long term	Prioritized (1-5) 0 - Nick/Lisa to complete 1 - Enact/Amd Ord In 2018; 2 - Activate in 2019; 3 - Activate w/in 5 yrs; 4 - Funding Source needs identifying 5 - Not Feasible at this time	Who is Responsible for Implementing	When It Will be Done	How It will be funded
442.a			X	-	-	-	X	-	-	1	Planning/GIS	prior to Nov 2018	current budget / staff
442.a			-	see if we can add layer from old ones	-	-	X	-	-	1	Planning/GIS	prior to Nov 2018	current budget / staff
442.a			-	add new RL areas	add any Hazus-MH layers we can utilize	-	X	-	-	1	Planning/GIS	prior to Nov 2018	current budget / staff
442.a			-	-	add newly identified	-	X	-	-	1	Planning/GIS	prior to Nov 2018	current budget / staff
442.a			-	-	see if we can add	-	X	-	-	1	Planning/GIS	prior to Nov 2018	current budget / staff
442.b			-	add old ones to a map layer	-	-	X	-	-	1	Planning/GIS	prior to Nov 2018	current budget / staff
452.c			-	ensure we are using currrent federal guidelines or better	-	-	X	-	-	1	Planing/Eng	prior to Nov 2018	current budget / staff
452.d			-	ensure we are using current federal guidelines or better	-	-	X	-	-	1	Planing/Eng	prior to Nov 2018	current budget / staff
312.a			-	Re-establish weekly checklist for better monitoring; Checklist of outstanding EC's will be generated weekly to Building Dept for review prior to inspections/permitting to ensure EC complaine	-	-	X	-	-	0	Planning	prior to Nov 2018	current budget / staffing
372.a			-	-	Create as part of the PPI Comm get input and maintenance	-	X	-	-	1	PPI/Planning	prior to Nov 2018	current budget / staffing

PROPOSED GOALS - STEP 6

Code Section Element No.	Step 7									Step 8			
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372.b			-	-	Create as part of the PPI Comm get input and maintenance	-	X	-	-	1	PPI/Planning	prior to Nov 2018	current budget / staffing
372.c			-	-	Create as part of the PPI Comm get input and maintenance	-	X	-	-	1	PPI/Planning	prior to Nov 2018	
322.c & 432.0 or 412.d			-	-	add map service to Outreach - if new regulation enacted add as well	-	X	-	-	1	PPI/Planning	prior to Nov 2018	annual outreach budget needed / current staffing
322.d			-	-	add service to Outreach if info rec'd from NOAA	-	X	-	-	1	PPI/Planning	prior to Nov 2018	annual outreach budget needed / current staffing
322.f			-	update info and outreach	-	-	X	-	-	1	PPI/Planning	prior to Nov 2018	annual outreach budget needed / current staffing
322.g			-	-	add service to Outreach	-	X	-	-	1	PPI/Planning	prior to Nov 2018	annual outreach budget needed / current staffing
332.a			-	update to all new Public Info topics and distribute	-	-	X	-	-	1	PPI/Planning	prior to Nov 2018	annual outreach budget needed / current staffing

PROPOSED GOALS - STEP 6

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332.b			-	create several different hazard notices and add service to Outreach	-	-	X	-	-	1	PPI/Planning	prior to Nov 2018	annual outreach budget needed / current staffing
332.c			-	-	create, get input and annual maintenance	-	-	-	-	1	PPI/Planning	prior to Nov 2018	current budget / staffing
332.d			-	-	add other agencies/services to Outreach	-	X	-	-	1	PPI/Planning	prior to Nov 2018	annual outreach budget needed / current staffing
342.a			-	-	get w/Real Estate people and ensure being done/ determine if way to improve & add service to Outreach / or create new Outreach specifically for this item	-	X	-	-	1	PPI/Planning	prior to Nov 2018	current budget / staffing
342.b			-	-	add to Outreach	-	X	-	-	1	PPI/Planning	prior to Nov 2018	annual outreach budget needed / current staffing

PROPOSED GOALS - STEP 6

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342.c			-	-	add service to Outreach / or create new Outreach specifically for this item	-	X	-	-	1	PPI/Planning	prior to Nov 2018	may need to create a brochure out of annual outreach budget needed / current staffing
342.d & 632.c			-	-	add info to Outreach	-	X	-	-	1	PPI/Planning	prior to Nov 2018	annual outreach budget needed / current staffing
352.a			-	add service to Outreach	-	-	X	-	-	1	PPI/Planning	prior to Nov 2018	annual outreach budget needed / current staffing
352.b			-	add service to Outreach	-	-	X	-	-	1	PPI/Planning	prior to Nov 2018	annual outreach budget needed / current staffing
352.c			-	update Outreach to add all new Public Info topics	-	-	X	-	-	1	PPI/Planning	prior to Nov 2018	current budget / staffing
352.c			X	make sure in Outreach	-	-	X	-	-	1	PPI/Planning	prior to Nov 2018	current budget / staffing

PROPOSED GOALS - STEP 6

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352.c			-	add info to web site & service to Outreach	-	-	X	-	-	1	PPI/Planning/GIS	prior to Nov 2018	current budget / staffing
362.a			-	add service to Outreach	-	-	X	-	-	1	PPI/Planning	prior to Nov 2018	current budget / staffing
362.b			-	add service to Outreach	-	-	X	-	-	1	PPI/Planning	prior to Nov 2018	annual outreach budget needed / current staffing
362.c			-	add service to Outreach	-	-	X	-	-	1	PPI/Planning	prior to Nov 2018	annual outreach budget needed / current staffing
372.a			-	-	add assessment to Outreach	-	X	-	-	1	PPI/Planning	prior to Nov 2018	annual outreach budget needed / current staffing
372.b			-	-	add service to Outreach	-	X	-	-	1	PPI/Planning	prior to Nov 2018	annual outreach budget needed / current staffing

PROPOSED GOALS - STEP 6

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372.c			-	-	add service to Outreach	-	X	-	-	1	PPI/Planning	prior to Nov 2018	annual outreach budget needed / current staffing
372.d			-	add service to Outreach	-	-	X	-	-	1	PPI/Planning	prior to Nov 2018	annual outreach budget needed / current staffing
442.a			-	make sure service is in all Outreach	-	-	X	-	-	1	PPI/Planning	prior to Nov 2018	annual outreach budget needed / current staffing
442.a			-	make sure service is in all Outreach	-	-	X	-	-	1	PPI/Planning	prior to Nov 2018	annual outreach budget needed / current staffing
442.a			-	make sure service is in all Outreach	-	-	X	-	-	1	PPI/Planning	prior to Nov 2018	annual outreach budget needed / current staffing

PROPOSED GOALS - STEP 6

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442.a			-	-	add service to Outreach if we create a map layer	-	X	-	-	1	PPI/Planning	prior to Nov 2018	annual outreach budget needed / current staffing
442.a			-	make sure service is in all Outreach	-	-	X	-	-	1	PPI/Planning	prior to Nov 2018	annual outreach budget needed / current staffing
442.a			-	make sure service is in all Outreach	-	-	X	-	-	1	PPI/Planning	add service to Outreach	annual outreach budget needed / current staffing
442.a			-	-	add service to Outreach if we create a map layer	-	X	-	-	1	PPI/Planning	prior to Nov 2018	annual outreach budget needed / current staffing
442.a			-	make sure service is in all Outreach	-	-	X	-	-	1	PPI/Planning	prior to Nov 2018	annual outreach budget needed / current staffing

PROPOSED GOALS - STEP 6

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442.a			-	-	add service to Outreach if we verify County has	-	X	-	-	1	PPI/Planning	prior to Nov 2018	annual outreach budget needed / current staffing
442.a			-	-	add service to Outreach if we create a map layer	-	X	-	-	1	PPI/Planning	prior to Nov 2018	annual outreach budget needed / current staffing
442.a			-	make sure service is in all Outreach		-	X	-	-	1	PPI/Planning	prior to Nov 2018	annual outreach budget needed / current staffing
442.a			-	-	add service to Outreach if we create a map layer	-	X	-	-	1	PPI/Planning	prior to Nov 2018	annual outreach budget needed / current staffing
442.a			-	-	add service to Outreach if we create a map layer	-	X	-	-	1	PPI/Planning	prior to Nov 2018	annual outreach budget needed / current staffing

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442.b			-	-	add service to Outreach	-	X	-	-	1	PPI/Planning	prior to Nov 2018	annual outreach budget needed / current staffing
442.c			-	-	add service to Outreach	-	X	-	-	1	PPI/Planning	prior to Nov 2018	annual outreach budget needed / current staffing
512.b			-	add service to Outreach	-	-	X	-	-	1	PPI/Planning	prior to Nov 2018	annual outreach budget needed / current staffing
542.d			-	add service to Outreach	-	-	X	-	-	1	PPI/Planning	prior to Nov 2018	annual outreach budget needed / current staffing
542.e			-	-	add service to Outreach	-	X	-	-	1	PPI/Planning	prior to Nov 2018	annual outreach budget needed / current staffing

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632.b			-	-	add service to Outreach	-	X	-	-	1	PPI/Planning	prior to Nov 2018	annual outreach budget needed / current staffing
632.c			-	-	add service to Outreach	-	X	-	-	1	PPI/Planning	prior to Nov 2018	annual outreach budget needed / current staffing
612.d			-	-	add service to Outreach	-	X	-	-	1	PPI/Planning	prior to Nov 2018	annual outreach budget needed / current staffing
632.c & 342.d			-	-	add service to Outreach	-	X	-	-	1	PPI/Planning	prior to Nov 2018	annual outreach budget needed / current staffing