

CITY OF WEST PALM BEACH
FLOODPLAIN MANAGEMENT PLAN

August 1, 2006

BACKGROUND

The City of West Palm Beach (City) is a coastal community, and like most coastal communities must consider, and in some cases, prepare for the likelihood of flooding. Considering the City's proximity to the Atlantic Ocean, its drainage system, available floodplain storage, and other related factors, proper floodplain management is crucial in protecting not only the City's assets, but also the property and assets of those who live and do business in the City.

West Palm Beach is one of many communities that participate in the National Flood Insurance Program (NFIP). Since its inception in 1968, the NFIP has focused on helping flood victims reestablish themselves by providing federally-backed flood insurance that encourages communities to enact and enforce floodplain regulations.

The Community Rating System (CRS) is an incentive based program designed to encourage floodplain management activities that exceed the NFIP minimum criteria/standards. Depending upon a community's floodplain management activities, the CRS can provide flood insurance premium reductions ranging from 5% to 45%. The CRS rating system is based on a scale of 1-10 with 1 being the best. The City of West Palm Beach has a current rating of 6 per a 2005 audit. It should be noted that per the 2004 rankings, the City was ranked as a 7 and was tied for the number 6 ranking out of 29 communities that participate in Palm Beach County.

The Floodplain Management Plan is a product of the stepwise CRS program established by FEMA. This program rewards communities with points toward a rate reduction by having communities go through a stepwise procedure with the focus on creating a Floodplain Management Plan which the community can adopt and implement.

The established mission for the Floodplain Management Committee was to develop a plan with the following goals:

- ❖ Reduce risk of flood damage through better floodplain management
- ❖ Preserve the beneficial functions of the floodplain
- ❖ Obtain CRS credit - potentially lowering flood insurance rates

The following elements were included in the stepwise planning process in order to maximize the plan's effectiveness.

1. Organize to Prepare the Plan
2. Involve the Public
3. Coordinate with Agencies and Organizations
4. Assess the Hazard
5. Assess the Problems
6. Set Goals
7. Review Mitigation Strategies
8. Draft Action Plan

9. Adopt the Plan
10. Implement, Evaluate and Revise the Plan

These elements are covered throughout the rest of this report.

ORGANIZE TO PREPARE THE PLAN

The first step that the City took was to organize. This was accomplished by contracting Hazen and Sawyer to act as the planner and to provide programmatic guidance to the City. Additionally, a Floodplain Management Committee (FMC) was formed. City staff, residents, business owners, and other community stakeholders were asked to participate in the planning process as committee members. The following individuals were part of the FMC:

City of West Palm Beach	Community Representative
John Lynch	Richard Wade (Stake holder)
Loren Shapiro	John Harry (Stake holder)
John Alford	Angela Prymas (SFMWD, Stake holder)
Chuck Taylor	Sal Faso (Resident, Stake holder)
Laban Reeves	Patsy Apicella (Stake holder)
	Deavon Utter (Resident, Stake holder)

The following tentative meeting schedule was created based on input from the FMC.

Tentative Date/Time	Projected Duration	Subject	Meeting Agenda
2 nd Week in June 2005, 4:00 PM	1.5 hrs.	Assess the hazard	The committee shall discuss various flood related hazards that have and potentially could affect the City.
4 th Week in June 2005, 4:00 PM	2 hrs.	Assess the problem	The committee shall assess the impact of flooding on the City. Specific areas of interest include impacts to the health and safety of the public, buildings, infrastructure, and natural areas.
2 nd Week in July 2005, 4:00 PM	2 hrs.	Set goals	Committee shall determine appropriate goals for the City's floodplain management plan that help mitigate the hazard.
4 th Week in July 2005, 4:00 PM	2 hrs.	Review activities	Committee shall identify and discuss potential activities that are relevant to achieving the goals set for the floodplain management plan.

Tentative Date/Time	Projected Duration	Subject	Meeting Agenda
1 st Week in August 2005, 4:00 PM	2 hrs.	Draft Action Plan	Committee shall draft an action plan based on the identified activities. This plan shall ultimately be considered for adoption and implementation.

Although some of dates changed, the intent of the meetings did not. Each meeting was documented with meeting minutes. These meeting minutes are attached as Exhibit A.

INVOLVE THE PUBLIC

The public were invited for comments once the FMC came up with a list of possible activities for the Action Plan. Comments from the public were noted in the meeting minutes attached as Exhibit A. It should be noted that over one half of the members of the FMC are representatives of the public and many of them live in flood prone areas. Additionally, all of the members of the FMC are considered public stakeholders and therefore have a vested interest in the success of the Action Plan.

COORDINATE WITH AGENCIES & ORGANIZATIONS

The following agencies were contacted at the beginning of the planning process:

- Department of Community Affairs (DCA)
- Palm Beach County (PBC)
- Northern Palm Beach County Improvement District (NPBCID)
- South Florida Water Management District (SFWMD)
- FEMA Region 4
- Lake Worth Drainage District

Each agency was asked if they had any projects of interest with respect to the CRS planning process and if they wanted to be actively involved in the planning process itself. The letters that were sent have been attached as Exhibit B. It should be noted that one of the public members of the FMC works for the SFWMD and provided valuable insight from the agency's perspective. A copy of the Draft Action Plan will be submitted to each agency listed above for review and/or comment.

ASSESS THE HAZARD

The following Hazards were identified by the FMC and assessed with respect to the Draft Action Plan:

- Hurricane/Tropical Storms
- Tornadoes
- Rainfall/Thunderstorms
- Erosion/Sinkholes

- Storm Surge
- Drought/Fire

HURRICANE/TROPICAL STORMS

Hurricane and Tropical Storms are part of life for many coastal communities. They impact communities in multiple ways. The primary impacts occur from heavy winds and rain. Secondary impacts can occur from loss of power, municipal services, and/or being displaced. Additional secondary impacts can come in the form of the economic difficulties. Many areas of the City are prone to losing power therefore causing disruptions in life. Additionally, economic impacts due to the loss of tourism and ecotourism can impact the City. The following probabilities (of striking Palm Beach County) have been assigned to each category of storm:

Category	Probability of Striking Palm Beach County
1	Every 3.1 Years
2	Every 5.3 Years
3	Every 11.5 Years
4	Every 202 Years
5	Every 1,500 Years

With the recent upswing in tropical activity over the past few years it has become clear that the current trend is exceeding the historic probabilities making the Action Plan a valuable document.

TORNADOES

Tornadoes, although not as prominent of a threat, are a natural hazard that the City must recognize. Records indicate that 135 tornadoes were reported in Palm Beach County between 1950 and 1998. The primary impacts associated with tornadoes are usually those that include damages to property, threat to life, and disruption in municipal services. Secondary impacts are usually associated with dealing with being displaced and trying to re-establish regular municipal services.

RAINFALL AND THUNDERSTORMS

Rainfall and Thunderstorms are a common occurrence for the City. The average rainfall for the City is approximately 61 inches per year with the wettest months being May through November. It should be noted that flooding significant enough to cause widespread property damage has occurred four times in the last decade for Palm Beach County. The primary impacts associated with rainfall and thunderstorms include damages to property, threat to life, and disruption in municipal services. Secondary impacts can include re-establishing municipal services and repairing damaged drainage system components.

With respect to the flooding caused by rainfall, a map indicating the FEMA flood zones with repetitive loss structures located in the City has been included as Exhibit C. Since the City is a coastal community, a majority of the hazards are related to rainfall generated or tropical events. The primary impacts associated with rainfall and thunderstorms include damages to property, threat to life, and disruption in municipal services. Secondary impacts can include re-establishing municipal services and repairing damaged drainage system components.

EROSION AND SINKHOLES

Erosion and Sinkholes are a threat by virtue of the fact that the City receives annually periods of heavy and sometimes intense rainfall. Erosion and Sinkholes are a result from the rainfall runoff process whereas the damage occurs when means to protect existing infrastructure and property either do not exist or simply fail. The primary impacts associated with erosion and sinkholes are due to the repair of the damaged infrastructure. Secondary impacts are usually associated with the loss of service of the particular infrastructure and the loss of service due to the repair.

STORM SURGE

Storm Surge is a hazard usually associated with tropical activity. The City has recognized this hazard and has posted storm surge maps for residents to view so that evacuations and advanced planning can occur. The primary impact due to storm surge is loss of life, loss or damage to property, and loss of municipal services. Secondary impacts can include prolonged disruption in municipal services.

DROUGHTS AND FIRES

Droughts and Fires are concerns for Florida during the winter and early spring months as monthly rainfall totals drop off. These hazards do not demand the level of concern for the City that flooding does, however they do require attention so that proper planning can take place. Primary impacts from droughts and fire include loss of life and loss or damage to property. Secondary impacts include disruption in municipal services.

All of the aforementioned hazards can impact the City's ability to provide municipal services and challenge their ability to provide an adequate level of protection for its residents.

ASSESS THE PROBLEM

The FMC, through a brain storming process, identified twenty-six problems/challenges associated with the hazards identified above. These twenty-six problems are listed below:

PROBLEMS /CHALLENGES ASSOCIATED WITH NATURAL HAZARDS (AS IDENTIFIED BY THE FMC)

1. Flooding of older areas.
2. Challenges relative to protecting historical building/features from damage.
3. Challenges associated with coordination between the City and other water managers.
4. Overstressed stormwater management facilities.
5. Challenges associated with post hazard recovery.
6. Adjustment of insurance premiums after a natural disaster.
7. Location of some critical facilities in flood prone areas (Good Samaritan Hospital and Water Treatment Plant).
8. Overall economic impact of the hazard.
9. Post disaster issues related to insects, vermin, and other unwanted pests.
10. Controlling waterborne diseases so that they do not impact the population.
11. Accessing and providing care for the aged and disabled before, during, and after a natural disaster.

**PROBLEMS /CHALLENGES ASSOCIATED WITH NATURAL HAZARDS
(AS IDENTIFIED BY THE FMC)
(Continued)**

12. Providing services to and accounting for seasonal residents.
13. Dealing with damaged infrastructure in a timely manner.
14. Accounting for the additional burden on local government due to their response to a natural disaster.
15. Accounting for the impact to the environment.
16. Accounting for impacts to the economy (especially tourism).
17. Coordinating decisions with other disaster managers in neighboring communities.
18. Dealing with sanitary sewer malfunctions.
19. Coordinating the consistent flow of traffic prior to, during and after a natural disaster.
20. Dealing with emergencies (fire and ambulatory) across the City.
21. Dealing with emergency evacuations.
22. Dealing with power outages and blackouts.
23. Managing trash and solid waste.
24. Coordinating the distribution of goods and services post disaster.
25. Dealing with pets.
26. Problems associated with records retention (especially related to business).

The twenty-six recognized problems/challenges facing the City are similar to the issues facing many communities. The FMC recognized the problems with older/historic areas of the City, as most of these areas are located near the downtown area. The FMC also recognized the problems associated with sustaining municipal services, and with providing adequate emergency services during and after a particular hazard. The FMC noted that some critical facilities such as Good Samaritan Hospital and the Water Treatment Plant were located in flood prone areas making them potential problem areas. Potential health related issues with respect to the proper and continued operation of the sanitary sewer collection system during a natural hazard were noted. Additionally, the FMC noted the problems that the natural areas located inside the City could face if a tropical hazard were to impact them. During the process of identifying the problems the FMC considered the repetitive loss structures (noted in Exhibit C) and the potential impacts for them as well. Finally, the FMC noted the problems associated with the economic impact of dealing with a hazard.

The FMC noted that the current trend in housing and development include redevelopment of downtown areas and the continued development of western area of the City. It was noted that as development of the western areas continues, loss of natural areas may continue, further decreasing the natural storage areas for stormwater runoff.

SET GOALS

After the FMC assessed the hazards and identified the problems, goals were established so that meaningful activities could be assigned. The following list of goals was established for the City:

FLOODPLAIN MANAGEMENT PLANNING GOALS

1. Implement a management system to embrace organizations, procedures and processes to protect health, safety, welfare, etc.
2. Identify cost effective measures to protect the environment, infrastructure, health, safety and welfare.
3. Identify critical, high risk areas.
4. Assess the economic impact of hazard occurrence.
5. Identify/recognize the "human impact" of hazards including dealing with the psychological and other impacts related to casualty and death.
6. Assess the environmental impact of hazards.
7. Create/Implement a comprehensive public information/education system. Make sure a means of communication exists.
8. Facilitate intergovernmental communications.
9. Develop a disaster recovery system.

The goals that were established reflect the drive of the FMC to establish meaningful goals that will ultimately lead to the protection of life, property, and municipal services.

REVIEW MITIGATION STRATEGIES

After the FMC set goals, a brainstorming session took place where activities were assigned to each of the eight proposed goals. It must be noted that the ninth goal was removed as this goal was already being accomplished by another department within the City. The following lists of activities were proposed for each of the eight goals:

1. Implement a management system to embrace organizations, procedures and processes to protect health, safety and welfare, etc.

- a) Assess the current Emergency Operation Center's (EOC's) effectiveness during the 2004 and 2005 hurricane seasons.
- b) Review management procedures that were utilized prior to the hurricanes and identify improvements in the management structure.
- c) Assess the readiness of the EOC by conducting mock drills.
- d) Assess the effectiveness of the EOC's communications with emergency services (fire, ambulatory and police) during the 2004 and 2005 hurricane seasons.
- e) Review the findings from a previous study that addressed how each department of the City performed during the 2004 and 2005 hurricanes.
- f) Develop a disaster recovery system.

2. Identify cost effective measures to protect the environment, infrastructure, health, safety and welfare of the City.

- a) Review the damages to the stormwater infrastructure that occurred during the 2004 and 2005 hurricane seasons and look for cost effective measures to better protect the system.
- b) Update stormwater infrastructure inventory and identify cost effective projects to protect the City.
- c) Identify cost effective projects to protect the City's drinking water supply from contamination.
- d) Review the 2000 Storm Water Master plan to determine which projects have been completed and which ones have not in areas with repetitive loss structures.

3. Identify critical, high risk areas.

- a) Identify facilities that are critical for the health and safety of the citizens of West Palm Beach.

4. Assess the economic impact of the natural hazard occurrence.

- a) Assess the economic impact to small businesses during the 2004 and 2005 hurricane seasons.
- b) Assess the ability of the City to financially support "event" homelessness (people displaced due to a natural hazard).
- c) Assess the City's plan to pay for "critical services" (fire, ambulatory and police) during and after a natural hazard event.
- d) Study the rise in insurance costs for the citizens of the City from the 2004 and 2005 hurricane seasons.
- e) Assess the City's plan to pay for extended municipal services before, during and after a natural hazard event.

5. Identify human impact of natural hazards.

- a) Evaluate emergency shelter plan(s) and determine if the maximum allotted time to keep shelters open is adequate.
- b) Study the psychological impacts to the citizens during the 2004 and 2005 hurricanes and produce a publicly available document to prepare the citizens for the emotional impact of a natural hazard event.
- c) Provide "impact letters" to residents so that they have documented proof that their home/area was impacted by a natural hazard event (to let bill collectors know that the resident is not living in the status quo).

6. Assess the environmental impacts of hazards.

- a) Review existing ecological and wildlife data for the catchment area prior to the 2004 hurricane season and compare it to current data to determine if any impacts have occurred.
- b) Identify hazardous material users within the City and determine if they have a contingency plan to protect those materials from impacting the environment during a natural hazard.

- c) Identify the areas where sanitary sewer hazards existed during the 2004 and 2005 hurricane seasons and provide a contingency plan to deal with potential contamination due to a natural hazard.

7. Implement a comprehensive public information/awareness system.

- a) Develop and implement a program to provide information to the public concerning high risk areas (areas that are in the floodplain).

8. Facilitate intergovernmental communications.

- a) Evaluate the current level of communication within the City and identify the hierarchy of the EOC.
- b) Evaluate how the EOC and other governmental agencies shared information during the 2004 and 2005 hurricane seasons.
- c) Evaluate the communications necessary so that stormwater can be discharged through multiple agency owned systems.

It should be noted that while all the activities listed were meaningful and good for the City, some of the activities are currently either taking place or have taken place due to on going work by other City departments. Once the FMC proposed the activities, a public meeting was held to go over the CRS process and to solicit additional information and concerns from the public. Public concerns are outlined in the meeting minutes attached as Exhibit A. The public comments and concerns primarily focused on how the plan will address potential sanitary sewer hazards during flood events, the interrelation between stormwater treatment and the City's water supply, coordination between the City and other agencies, and the total costs of the proposed plan.

Upon review of the public comments, the FMC then identified which activities were currently not being addressed. Out of the original 26 proposed activities only the following 10 were included in the Action Plan.

1. Assess the current Emergency Operation Center's (EOC's) effectiveness during the 2004 and 2005 hurricane seasons.
2. Review management procedures that were utilized prior to the hurricanes and identify improvements in the management structure.
3. Review the 2000 Storm Water Master plan to determine which projects have been completed and which one have not in areas with repetitive loss structures.
4. Assess the ability of the City to financially support "event" homelessness (people displaced due to a natural hazard).
5. Assess the City's plan to pay for "critical services" (fire, ambulatory and police) during and after a natural hazard event.
6. Assess the City's plan to pay for extended municipal services before, during and after a natural hazard event.
7. Evaluate emergency shelter plan(s) and determine if the maximum allotted time to keep shelters open is adequate.
8. Review existing ecological and wildlife data for the catchment area prior to the 2004 hurricane season and compare it to current data to determine if any impacts have occurred.
9. Provide "impact letters" to residents so that they have documented proof that their home/area was impacted by a natural hazard event (to let bill collectors know that

- the resident is not living in the status quo).
10. Develop and implement a program to provide information to the public concerning high risk areas (areas that are in the floodplain).

The difference between the original number activities and those included in the Action Plan are that some of the activities were currently being addressed by other City departments, some were combined into one activity and others were simply deemed unnecessary. In addition the activities were regrouped to fit the CRS format, as the FMC wrote specific activities for each goal that was established. As part of the process the FMC then grouped the activities that were not currently being addressed into the following activity groups:

- Preventative Activities
- Property Protection Activities
- Natural Area/Flood Plain Protection Activities
- Emergency Services Activities
- Structural Activities
- Public Information Activities

The FMC grouped the activities and assigned to each activity the following key items:

- A summary of the proposed activity,
- A proposed time frame for completion,
- Potential funding sources, and
- The responsible department(s).

The following action plan was developed as a result of the preceding seven steps.

ACTION PLAN

1.0 Preventive Activities

- A. The City of West Palm Beach proposes to review and update the stormwater infrastructure inventory and identify cost effective projects to protect the City.

Schedule: Phase I is complete. Phase II is estimated at \$70 million and currently under design. Phase III is unscheduled.

Funding: Phase II is funded through the Public Utilities budget. Phase III is currently unfunded.

Responsible Party: Public Utilities Engineering, Public Utilities Administration

2.0 Property Protection Activities

No activities were assigned to this category.

3.0 Natural Area/Flood Plain Protection Activities

- A. The City of West Palm Beach proposes to identify hazardous material users within the City and create a contingency plan for the City to protect those materials from impacting the environment during a natural disaster.

Schedule: Complete plan by August 1, 2006.

Funding: Internal sources to create plan. Plan to include funding needs and sources in FY07 budget.

Responsible Party: Public Utilities, Emergency Management

- B. The City of West Palm Beach proposes to identify areas where sanitary sewer hazards exist and develop a contingency plan to deal with potential contamination due to a natural disaster.

Schedule: Phase I is complete. Phase II is estimated at \$70 million and currently under design. Phase III is unscheduled.

Funding: Phase II is funded through the Public Utilities budget. Phase III is currently unfunded.

Responsible Party: Public Utilities Engineering, Public Utilities Administration

4.0 Emergency Services Activities

- A. The City of West Palm Beach proposes to review the City's ability to pay for "critical services" (fire, ambulatory and police) and extended municipal services immediately before, during and after a natural hazard event.

Schedule: Completed

Funding: The City has internal financial resources to fund the critical services needed before, during, and after a natural hazard event. Internal financial resources include, but are not limited to the following items:

The City annually includes within its Operating Budget a contingency designation equivalent to 1-2% of operating revenues (i.e. approx. \$1.5 to \$3.5 million annually). The contingency funds are to be used for unanticipated expenditures as deemed necessary by the City Commission; such as additional overtime requirements resulting from a natural disaster.

Additionally, the City maintains a fund balance reservation equivalent to 15% of operating revenues. Said funding is reserved for emergencies such as natural disasters, unanticipated economic downturns, etc. and totals approximately \$18 million as of September 30, 2006.

It should be noted that the City aggressively works with external governmental entities (i.e. FEMA, State of Florida, etc.) to ensure maximization of financial aid opportunities with the goal of offsetting the costs to its stakeholders of natural hazard events.

Responsible Party: Finance Department, City Commission

- B. The City of West Palm Beach proposes to evaluate emergency shelter plan(s) and determine if the maximum allotted time to keep shelters open is adequate. Additionally the City proposes to assess current plans and make recommendations on how to handle "event" homelessness (people displaced due to a natural hazard).

Schedule: Complete by August 1, 2006.

Funding: None required.

Responsible Party: City Administration, Emergency Management

- C. The City of West Palm Beach proposes to assess the current Emergency Operation Center's (EOC's) effectiveness during the 2004 and 2005 hurricane seasons. Particular attention shall be given to the review of management procedures utilized during the 2004 and 2005 hurricane seasons and the procedure for communication with emergency services (fire, ambulatory, and police).

Schedule: Complete by August 1, 2006.

Funding: None required.

Responsible Party: City Administration, Emergency Management

- D. The City of West Palm Beach proposes to evaluate how the EOC and other governmental agencies shared information during the 2004 and 2005 hurricane seasons.

Schedule: Complete by August 1, 2006.

Funding: None required.

Responsible Party: Public Utilities, Emergency Management

- E. The City of West Palm Beach will review or set up a system by which communication between local water district managers is held.

Schedule: Complete by August 1, 2006.

Funding: None required.

Responsible Party: Public Utilities, Emergency Management

5.0 Structural Project Activities

- A. The City of West Palm Beach proposes to review the 2002 Masterplan and determine which projects have been completed in the areas with repetitive loss structures. Additionally the City will review and assign priority to existing projects that have not been completed.

Schedule: Phase I is complete. Phase II is estimated at \$70 million and currently under design. Phase III is unscheduled.

Funding: Phase II is funded through the Public Utilities budget. Phase III is currently unfunded.

Responsible Party: Public Utilities Engineering, Public Utilities Administration

6.0 Public Information Activities

- A. The City of West Palm Beach proposes to develop and implement a program to provide information to the public concerning high risk areas (areas that are located in the floodplain).

Schedule: FY07

Funding: FY07 CSD 130 budget.

Responsible Party: Construction Services Department, Permitting

ADOPT THE PLAN

It is anticipated that the Action Plan will be presented for formal adoption.

IMPLEMENT, EVALUATE, REVISE

Once the Action Plan has been adopted, the implementation of each activity should begin. The City should establish a means for self evaluation and incorporate a method for revising the Action Plan as required. The following steps should be taken to ensure that the action plan is kept up to date and to fulfill the CRS recertification process:

Annual Reports:

1. The FMC should prepare an annual evaluation report indicating which activities have been completed and revising (as necessary) the time frames, funding sources and/or responsible party information for any unfinished activities. The annual reports should include the following:
 - a. Information on how the reader can obtain a copy of the original plan
 - b. A review of each activity in the action plan, including a statement on how much was accomplished during the previous year
 - c. A brief discussion on why any objectives were not reached (if applicable)
 - d. Updates on existing activities and recommendations for new ones

Five Year Updates:

2. The FMC should update the Action Plan every five years and include the following items:
 - a. A review and update (if necessary) of the hazard and problem assessments
 - b. An updated Action Plan that accounts for completed, dropped or changed activities
 - c. Comments from agencies and organizations that review the updated Action Plan
 - d. Minutes from all meetings including a public meeting which will be held prior to presentation of the plan for adoption
 - e. Information on whether or not the Action Plan has been adopted

The annual report and the five-year update should be completed so that the City can maintain or improve its current CRS rating.

**EXHIBIT A
(Meeting Minutes)**

**CITY OF WEST PALM BEACH
CRS FLOODPLAIN MANAGEMENT PLAN**

KICK-OFF MEETING AGENDA

**April 21, 2005
2:00 p.m.**

1. Introduction of key personnel (City and H&S)
2. Review of project scope/work plan
3. Review of project schedule
4. Identification of key initial action items
5. Schedule next progress meeting
6. Adjourn

**City of West Palm Beach
CRS Floodplain Management Plan**

Work Plan

The development of the floodplain management plan shall follow the 10 step process outlined in CRS Activity 510. Specifically, the plan shall follow the following process:

- a. Organize to prepare the plan
- b. Involve the public
- c. Coordinate with other agencies
- d. Assess the hazard
- e. Assess the problem
- f. Set goals
- g. Review possible activities
- h. Draft an action plan
- i. Adopt the plan
- j. Implement, evaluate and revise

Step 1 - Organize to Prepare the Plan

Formally create a planning committee.

Suggested Committee Makeup:

City

Planning

Engineering/Public Works

Building Department

Emergency Management

Environmental Protection

****City to provide potential participants***

Community

HOA Leaders

Neighborhood Association Leaders

Civic Leaders

Business Leaders

Affected Residents

Step 2 - Involve the Public

Organize and conduct various activities intended to involve the public, including:

- Public meetings starting at the outset of the planning process and ending at completion of the draft plan.
 - ***Identify preferred meeting locations***
 - ***Identify preferred days/times***

- Development of public information and questionnaires soliciting public input and encouraging input to the planning process.
 - ***Identify City liaison for approving mailings***
 - ***Identify City liaison for coordinating mailings***

Step 3 - Coordinate with Other Agencies

Contact and coordinate with other agencies which may be involved in activities relative to floodplain management. Anticipated agencies include SFWMD, USACOE, Palm Beach County and NFIP Coordinator.

- ***Other agencies?***

Step 4 - Assess the Hazard [Includes Planning Committee Meeting]

Provide a description of the flood hazard areas (including the source/cause) based on existing information. Discuss past flooding events which have affected the City, as well as other natural hazards which may have affected the City.

- ***Determine availability of flooding records. Identify City source(s) for data.***

Step 5 - Assess the Problem [Includes Planning Committee Meeting]

Assess the impact of flooding on the City including the following:

- Identification of the number and types of buildings subject to hazards identified in the hazard assessment, including a review of all repetitive loss properties.
 - ***Obtain copy of Repetitive Loss Database***
- Description of the past impact of flooding on buildings, infrastructure and public health and safety.
- Description of the need and procedures for warning and evacuating residents/visitors.
- Identification of natural and beneficial function areas which should be protected.
- Description of development/redevelopment trends in the watershed, the floodplain and natural resource areas.

Step 6 - Set Goals [Includes Planning Committee Meeting]

Prepare a statement of the City's floodplain management program goals. These will be established in meetings of the planning committee.

Step 7 - Review Possible Activities [Includes Planning Committee Meeting]

Develop floodplain management activities to be implemented within the following categories:

- Preventative (regulations/standards)
- Protective (floodproofing, building elevation, acquisition, etc.)
- Natural Resource Protection (wetlands protection, sediment and erosion control, etc.)
- Emergency Services (flood warnings/response, critical facilities protection, etc.)
- Structural Projects (storm drainage improvements)
- Public Information (maps, public outreach, etc.)

Step 8 - Draft Action Plan [Includes Planning Committee Meeting]

Draft an action plan based on the possible activities reviewed in Step 7. The responsible party, funding source and schedule must be identified for each activity to be implemented. Draft action plans should be distributed for review.

Step 9 - Adopt the Plan [Includes Public Meetings]

Formal adoption of the plan by the City.

Step 10 - Implement the Plan

Develop procedures for monitoring implementation.

MEETING MINUTES

TO: John Lynch, City of West Palm Beach

FROM: Billy J. Almaguer, P.E.

MEETING

DATE: Thursday, July 7, 2005

SUBJECT: West Palm Beach - CRS

ATTENDEES:

John Lynch, City of WPB
Sal Faso, Local Business Leader
Richard Wade, City Resident
Patsy Apillelle, City Resident
Rob Taylor, H&S
Billy Almaguer, H&S

At approximately 4:00 PM the Floodplain Management Committee meeting convened. The first order of business was to review the rules concerning the Sunshine and Public Records Laws. Copies of the Sunshine Law were distributed to the Committee members and members were sworn in.

At approximately 4:20 PM, after the Committee was sworn in, Rob Taylor began the presentation by going over the National Flood Insurance Program (NFIP) program and more specifically the Community Rating System (CRS). He also covered the ways that the CRS can impact a community such as West Palm Beach.

Rob discussed the City of West Palm Beach's current rating, and the effects to flood insurance premiums it corresponds to. The Committee discussed some of the characteristics of flood insurance such as cost, who must be covered, who can be covered, etc. Furthermore Rob talked about the planning process overview and went step by step through the required process.

The focus of this meeting was, as a Committee, to collectively discuss natural hazards that threaten the City of West Palm Beach.

Sal Faso, Richard Wade and Patsy Apicella provided a list of potential natural hazards for the City of West Palm Beach. This list includes hurricanes, flooding and windstorms. The Committee and City staff provided some information regarding past flooding events and the manner in which they affected different areas of the City.

Rob concluded the meeting by going over the anticipated meeting schedule.

c: *Attendees*
40002

MEETING MINUTES

TO: Distribution
FROM: Billy J. Almaguer, P.E.

MEETING

DATE: Tuesday, August 2, 2005

**SUBJECT: West Palm Beach – Floodplain Management Plan
Committee Meeting**

ATTENDEES:

Billy Almaguer, H&S
Patsy Apicella, Committee Member
Sal Faso, Committee Member
John Lynch, City of WPB
Angela Prymas, Committee Member
Laban Reeves, Environmental Protection/Parks
Loren Shapiro, City of WPB
Rob Taylor, H&S
Deavon Uter, Committee Member
Richard Wade, Committee Member

At approximately 4:00 pm Rob Taylor began the meeting by briefly reviewing the content of the previous Floodplain Management Committee meeting. This included the review of the natural hazards that the committee previously identified. The Committee then turned its focus to addressing the problems associated with the natural hazards affecting the City of West Palm Beach. The Committee identified various problems which have affected, or might affect the community as a result of a natural hazard/disaster. The list developed by the Committee is included as Attachment A.

The Committee then set goals based on the problems associated with the natural hazards/disasters. The list of goals has been included as Attachment B.

The scope of the next Committee Meeting (Review Possible Activities) was briefly discussed, and a tentative meeting date of August 16 was set. Meeting adjourned at approximately 6:00 P.M.

C: *Attendees*
40002-000

ATTACHMENT A

PROBLEMS ASSOCIATED WITH NATURAL HAZARDS (AS IDENTIFIED BY PLANNING COMMITTEE)

1. Flooding of older areas.
2. Challenges relative to protecting historical building/features from damage.
3. Challenges associated with coordination between the City and other water managers.
4. Overstressed stormwater management facilities.
5. Challenges associated with post hazard recovery.
6. Adjustment of insurance premiums after a natural disaster.
7. Location of some critical facilities in flood prone areas (Good Samaritan Hospital and Water Treatment Plant).
8. Overall economic impact of the hazard.
9. Post disaster issues related to insects, vermin, and other unwanted pests.
10. Controlling waterborne diseases so that they do not impact the population.
11. Accessing and providing care for the aged and disabled before, during, and after a natural disaster.
12. Providing services to and accounting for seasonal residents.
13. Dealing with damaged infrastructure in a timely manner.
14. Accounting for the additional burden on local government due to their response to a natural disaster.
15. Accounting for the impact to the environment.
16. Accounting for impacts to the economy (especially tourism).
17. Coordinating decisions with other disaster managers in neighboring communities.
18. Dealing with sanitary sewer malfunctions.
19. Coordinating the consistent flow of traffic prior to, during and after a natural disaster.
20. Dealing with emergencies (fire and ambulatory) across the City.
21. Dealing with emergency evacuations.

ATTACHMENT A

**PROBLEMS ASSOCIATED WITH NATURAL HAZARDS
(AS IDENTIFIED BY PLANNING COMMITTEE)**

(Continued)

- 22. Dealing with power outages and blackouts.
- 23. Managing trash and solid waste.
- 24. Coordinating the distribution of goods and services post disaster.
- 25. Dealing with pets.
- 26. Problems associated with records retention (especially related to business).

ATTACHMENT B

FLOODPLAIN MANAGEMENT PLANNING GOALS

1. Implement a management system to embrace organizations, procedures and processes to protect health, safety, welfare, etc.
2. Identify cost effective measures to protect the environment, infrastructure, health, safety and welfare.
3. Identify critical, high risk areas.
4. Assess the economic impact of hazard occurrence.
5. Identify/recognize the "human impact" of hazard including dealing with the psychological and other impacts related to casualty and death.
6. Assess the environmental impact of hazards.
7. Create/Implement a comprehensive public information/education system. Make sure a means of communication exists.
8. Facilitate intergovernmental communications.
9. Develop a disaster recovery system.

MEETING MINUTES

TO: Distribution

FROM: Billy Almaguer, P.E.

MEETING

DATE: Tuesday, August 23, 2005

SUBJECT: West Palm Beach - Floodplain Management Plan Committee Meeting

ATTENDEES:

John Alford, City of WPB
Billy Almaguer, H&S
Patsy Apicella, Committee Member
Sal Faso, Committee Member
Angela Prymas, Committee Member
Laban Reeves, Environmental Protection/Parks
Loren Shapiro, City of WPB
Deavon Uter, Committee Member

At 4:00 pm Billy Almaguer began the meeting by briefly reviewing the content from the previous Floodplain Management Committee meeting. This included a review of the natural hazards, problems and goals that were set by the Committee.

The Committee then began to assign activities for each of the goals that were previously developed. The list of activities has been included as Attachment A.

The meeting adjourned at approximately 6:00 pm.

*c: Attendees
40002-001*

Attachment A

- 1. Implement a management system to embrace organizations, procedures and processes to protect health, safety and welfare, etc.**
 - a. Assess the current Emergency Operation Center's (EOC's) effectiveness during the 2004 hurricane season.
 - b. Review management procedures that were utilized prior to the hurricanes and identify recognized failures in the management structure.
 - c. Assess the readiness of the EOC by conducting mock drills.
 - d. Assess the effectiveness of the EOC's communications with emergency services (fire, ambulatory and police) during the 2004 hurricane season.
 - e. Review the findings from a previous study that addressed how each department of the City performed during the 2004 hurricanes.
 - f. Develop a disaster recovery system.

- 2. Identify cost effective measures to protect the environment, infrastructure, health, safety and welfare of the City.**
 - a. Review the damages to the stormwater infrastructure that occurred during the 2004 hurricane season and look for cost effective measures to better protect the system.
 - b. Update stormwater infrastructure inventory and identify cost effective projects to protect the City.
 - c. Identify cost effective projects to protect the City's drinking water supply from contamination.
 - d. Review the 2002 Masterplan to determine which projects have been completed in areas with repetitive loss structures.

- 3. Identify critical, high risk areas.**
 - a. Identify facilities that are critical for the health and safety of the citizens of West Palm Beach.

- 4. Assess the economic impact of the natural hazard occurrence.**
 - a. Assess the economic impact to small businesses during the 2004 hurricane season.
 - b. Assess the ability for the City to financially support "event" homelessness (people displaced due to a natural hazard).
 - c. Assess the City's plan to pay for "critical services" (fire, ambulatory and police) during and after a natural hazard event.
 - d. Study the rise in insurance costs for the citizens of the City from last year's hurricane season.
 - e. Assess the City's plan to pay for extended municipal services during and after a natural hazard event.

**Attachment A
(Continued)**

5. Identify human impact of natural hazards.

- a. Evaluate emergency shelter plan(s) and determine if the maximum allotted time to keep shelters open is adequate.
- b. Study the psychological impacts to the citizens during last season's hurricanes and produce a publicly available document to prepare the citizens for the emotional impact of a natural hazard event.
- c. Provide "impact letters" to residents so that they have documented proof that their home/area was impacted by a natural hazard event (to let bill collectors know that the resident is not living in the status quo).

6. Assess the environmental impacts of hazards.

- a. Review existing ecological and wildlife data for the catchment area prior to the 2004 hurricane season and compare it to current data to determine if any impacts have occurred.
- b. Identify hazardous material users within the City and determine if they have a contingency plan to protect those materials from impacting the environment during a natural hazard.
- c. Identify the areas where sanitary sewer hazards existed during the 2004 hurricane season and provide a contingency plan to deal with potential contamination due to a natural hazard.
- d. Study the impact of last year's hurricanes on the insect population in the City.

7. Implement a comprehensive public information/awareness system.

- a. Develop and implement a program to provide information to the public concerning high risk areas (areas that are in the floodplain).

8. Facilitate intergovernmental communications.

- a. Evaluate the current level of communication within the City and identify the hierarchy of the EOC.
- b. Evaluate how the EOC and other governmental agencies shared information during the 2004 hurricane season.
- c. Evaluate the communications necessary so that stormwater can be discharged through multiple agency owned systems.

MEETING MINUTES

TO: Attendees

FROM: Billy Almaguer, P.E.

MEETING

DATE: October 5, 2005

SUBJECT: West Palm Beach - Floodplain Management Plan Public Meeting

Attendees:

City of WPB

John Lynch
Loren Shapiro
John Alford
Labar Reeves
Patsy Apicella, Member

Hazen and Sawyer

Rob Taylor
Billy Almaguer

Public

Acan Levine
Gigi Tylander
Jacqueline Reeves
Art Apicella

At 5:00 P.M. the public meeting began with John Lynch providing a brief description of the CRS public meeting process and an introduction to Rob Taylor (Hazen and Sawyer). Rob briefly went over the CRS planning process, highlighting the decisions that the committee has made with respect to the CRS process. Rob then briefly discussed the list of activities that the Committee developed for the Action Plan, and concluded by opening the floor for questions and comments.

Several items came up during the question/comment portion of the public meeting. They were as follows:

- The public expressed an interest in the potential hazards associated with the sanitary sewer system and the potential for water borne diseases due to the affects of a natural hazard.
- The public expressed concern over the interrelation between stormwater treatment and the City's water supply (surface water).
- The public inquired about input on the plan that may have been received from other agencies. It was noted that various outside agencies had been invited to lend input and participate in the process, and that the draft action plan would be submitted to various agencies for comments.

- The public inquired about the estimated cost for implementation of the plan. It was noted that such costs had not been developed and were currently outside of the Consultant's scope of work.

Upon conclusion of the question/comment portion of the meeting Rob indicated that the Committee has proposed an activity that will review the areas where sanitary sewer hazards existed during the 2004 hurricane season and to provide a contingency plan to deal with potential contamination due to future natural hazards.

Floodplain Management Plan Meeting Minutes

Date: July 24, 2006
Time: 10:00 AM – 11:30 AM
Location: City Hall – 3rd Floor Conference Room

Attendees:

Lee Menke
Richard Wade
Denise Malone

Meeting was announced via email with copy of plan attached in Acrobat format to all members on 07/07/2006. Reminder was sent on 07/21/2006.

Lee opened the meeting at 10:15 AM with a request for general comments. Richard stated that the document fully captured the committee's prior comments and that the document was well organized.

The committee reviewed the Plan one page at a time starting with Page 1.

Page 1 through 10 – No changes.

Action Plan section: The committee felt that all other documents referenced in the Plan should be specifically listed with their exact titles. Lee will get with Departments to obtain exact titles and forward to Hazen & Sawyer for incorporation into final document.

Page 11, Item 2.0 should be deleted or action items added.

Page 14 – Denise questioned whether the Floodplain Management Committee or a City Department should be responsible for creating the annual reports and five year updates. Lee to address this with Hazen & Sawyer.

Exhibit C – Map should be modified so that there is better differentiation between the colors, the source and date of the map needs to be stated on the map, and that the City boundaries especially on the West side be verified for accuracy.

Denise stated that the [Planning and Zoning Department's] Comprehensive Plan, in fulfillment of statutory requirements, contains references and policies regarding this subject and that it will be updated to reflect the Floodplain Management Plan and its associated actions.

The meeting was adjourned at 11:30 AM.

EXHIBIT B
(Agency Coordination)

June 28, 2005

Todd Davidson
Director of Mitigation
FEMA REGION 4
3003 Chamblee Tucker Road
Atlanta, GA 30341

**City of West Palm Beach,
Palm Beach County, Florida
Floodplain Management Plan**

Dear Mr. Davidson:

The City of West Palm Beach is in the process of preparing a Floodplain Management Plan. As part of that process, we are contacting other local and regional agencies which may have projects and/or programs which might affect the City's program or be of benefit to the City in developing the program. If you have any such information, we would appreciate it if we could obtain a copy. Please contact me via email (balmaguer@hazenandsawyer.com) or telephone (772 489-0066), to coordinate the best manner for us to obtain the information. If you do not have any information which you think would be of assistance to us, please call or email me to let me know.

Later in the process, we intend to meet with the agencies and organizations which are interested in reviewing and discussing this matter. Also, for those agencies which are interested, we will distribute a draft of the Floodplain Management Plan for their review. If you are interested in either or both of these opportunities, please email or phone me.

On behalf of the City, we would like to thank you for your time and cooperation with regard to this matter.

Very truly yours,

HAZEN AND SAWYER, P.C.

Billy Almaguer, P.E.
Principal Engineer

c: *John Lynch*
Rob Taylor, Jr., P.E.

June 28, 2005

Patrick A. Martin
District Engineer
LAKE WORTH DRAINAGE DISTRICT
13081 Military Trail
Delray Beach, Florida 33484

**City of West Palm Beach,
Palm Beach County, Florida
Floodplain Management Plan**

Dear Mr. Martin:

The City of West Palm Beach is in the process of preparing a Floodplain Management Plan. As part of that process, we are contacting other local and regional agencies which may have projects and/or programs which might affect the City's program or be of benefit to the City in developing the program. If you have any such information, we would appreciate it if we could obtain a copy. Please contact me via email (balmaguer@hazenandsawyer.com) or telephone (772 489-0066), to coordinate the best manner for us to obtain the information. If you do not have any information which you think would be of assistance to us, please call or email me to let me know.

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On behalf of the City, we would like to thank you for your time and cooperation with regard to this matter.

Very truly yours,

HAZEN AND SAWYER, P.C.

Billy Almaguer, P.E.
Principal Engineer

c: *John Lynch*
Rob Taylor, Jr., P.E.

June 28, 2005

Mr. Charles Speights
DEPARTMENT OF COMMUNITY AFFAIRS
STATE ASSISTANT OFFICE FOR THE NFIP
2555 Shumard Oaks Boulevard
Tallahassee, Florida 32399-2100

**City of West Palm Beach,
Palm Beach County, Florida**
Floodplain Management Plan

Dear Mr. Speights:

The City of West Palm Beach is in the process of preparing a Floodplain Management Plan. As part of that process, we are contacting other local and regional agencies which may have projects and/or programs which might affect the City's program or be of benefit to the City in developing the program. If you have any such information, we would appreciate it if we could obtain a copy. Please contact me via email (balmaguer@hazenandsawyer.com) or telephone (772 489-0066), to coordinate the best manner for us to obtain the information. If you do not have any information which you think would be of assistance to us, please call or email me to let me know.

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On behalf of the City, we would like to thank you for your time and cooperation with regard to this matter.

Very truly yours,

HAZEN AND SAWYER, P.C.

Billy Almaguer, P.E.
Principal Engineer

c: *John Lynch*
Rob Taylor, Jr., P.E.

June 28, 2005

Mr. George T. Webb, P.E.
PALM BEACH COUNTY
Engineering Building
160 Australian Avenue
West Palm Beach, Florida 33406

**City of West Palm Beach,
Palm Beach County, Florida
Floodplain Management Plan**

Dear Mr. Webb:

The City of West Palm Beach is in the process of preparing a Floodplain Management Plan. As part of that process, we are contacting other local and regional agencies which may have projects and/or programs which might affect the City's program or be of benefit to the City in developing the program. If you have any such information, we would appreciate it if we could obtain a copy. Please contact me via email (balmaguer@hazenandsawyer.com) or telephone (772 489-0066), to coordinate the best manner for us to obtain the information. If you do not have any information which you think would be of assistance to us, please call or email me to let me know.

Later in the process, we intend to meet with the agencies and organizations which are interested in reviewing and discussing this matter. Also, for those agencies which are interested, we will distribute a draft of the Floodplain Management Plan for their review. If you are interested in either or both of these opportunities, please email or phone me.

On behalf of the City, we would like to thank you for your time and cooperation with regard to this matter.

Very truly yours,

HAZEN AND SAWYER, P.C.

Billy Almaguer, P.E.
Principal Engineer

c: *John Lynch*
Rob Taylor, Jr., P.E.

June 28, 2005

Anthony Las Casas, P.E.
**NORTHERN PALM BEACH COUNTY
IMPROVEMENT DISTRICT**
357 Hiatt Drive
Palm Beach Gardens, Florida 33418

**City of West Palm Beach,
Palm Beach County, Florida
Floodplain Management Plan**

Dear Mr. Las Casas:

The City of West Palm Beach is in the process of preparing a Floodplain Management Plan. As part of that process, we are contacting other local and regional agencies which may have projects and/or programs which might affect the City's program or be of benefit to the City in developing the program. If you have any such information, we would appreciate it if we could obtain a copy. Please contact me via email (balmaguer@hazenandsawyer.com) or telephone (772 489-0066), to coordinate the best manner for us to obtain the information. If you do not have any information which you think would be of assistance to us, please call or email me to let me know.

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On behalf of the City, we would like to thank you for your time and cooperation with regard to this matter.

Very truly yours,

HAZEN AND SAWYER, P.C.

Billy Almaguer, P.E.
Principal Engineer

c: *John Lynch*
Rob Taylor, Jr., P.E.

June 28, 2005

Mr. Tony Waterhouse
SOUTH FLORIDA WATER MANAGEMENT DISTRICT
3301 Gun Club Road
West Palm Beach, Florida 33406

**City of West Palm Beach,
Palm Beach County, Florida
Floodplain Management Plan**

Dear Mr. Waterhouse:

The City of West Palm Beach is in the process of preparing a Floodplain Management Plan. As part of that process, we are contacting other local and regional agencies which may have projects and/or programs which might affect the City's program or be of benefit to the City in developing the program. If you have any such information, we would appreciate it if we could obtain a copy. Please contact me via email (balmaguer@hazenandsawyer.com) or telephone (772 489-0066), to coordinate the best manner for us to obtain the information. If you do not have any information which you think would be of assistance to us, please call or email me to let me know.

Later in the process, we intend to meet with the agencies and organizations which are interested in reviewing and discussing this matter. Also, for those agencies which are interested, we will distribute a draft of the Floodplain Management Plan for their review. If you are interested in either or both of these opportunities, please email or phone me.

On behalf of the City, we would like to thank you for your time and cooperation with regard to this matter.

Very truly yours,

HAZEN AND SAWYER, P.C.

Billy Almaguer, P.E.
Principal Engineer

c: *John Lynch*
Rob Taylor, Jr., P.E.

EXHIBIT C
(Repetitive Loss Structures)

Repetitive Loss Sites

3600 VILLAGE BLVD



1100 N FLORIDA MANGO

1137 CLARE AVE

2028 DOCK ST

934 YORK ST

2030 DOCK ST

1801 BELVEDERE RD

3201 S DIXIE HWY

INFORMATION DEPICTED HEREON IS COMPILED FROM VARIOUS AGENCIES AND ASSORTED SOURCES. DATA SHOULD BE USED FOR REFERENCE PURPOSES ONLY. THE CITY OF WEST PALM BEACH ASSUMES NO RESPONSIBILITY FOR ERRORS ARISING FROM MISUSE OF THIS INFORMATION.

Legend

Repetitive Loss Sites FEMA Flood Zones
Streets
 other values >

CFCC	ZONE
	Zone AE
	Zone AH
	Zone AO
	UNDES
	Zone X
	Zone X500

State Hwy
 Arterial Rd
 Collector Rd
 Highway Ramp
 Residential Street
 City Limits

