



EMERGENCY ACTION PLAN

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TABLE OF CONTENTS

CHAPTER

1. Introduction.....	01
2. Authority.....	05
3. Mutual Aid Agreements.....	07
4. Personnel for Flood Organization.....	11
5. Contacts.....	15
6. Flood Elevations and History.....	18
7. Tasks and Prioritized Actions.....	23
8. Emergency Shelters.....	25
9. Evacuation.....	28
10. Utilities.....	32
11. Critical Facilities.....	36
12. Hazardous Materials.....	39
13. Communications.....	41
14. Training and Exercises.....	45
15. Mitigation, Floodplain Management and Insurance: Lessons Learned.....	48

APPENDIX

A. Links to Additional Resources.....	54
B. Forms.....	61
a. Record of Plan Distribution.....	62
b. Record of Plan Updates.....	63
c. Public Meeting Sign-in Sheet.....	64
d. Public Meeting Comment Sheet.....	65
e. Sample Resolutions.....	66
f. Call Tree.....	70
g. Personnel For Flood Organization.....	71
h. Organizational Chart.....	73
i. Outside Contacts.....	74
j. Task Summary List by Elevation.....	76
k. Task Worksheet.....	78
l. Summary of Shelters.....	80

TABLE OF CONTENTS CONTINUED

m. Evaluation of Shelters.....	81
n. Special Needs Registry.....	82
o. Special Needs Registry Participant Waiver Sheet.....	83
p. Sample Evacuation Map.....	84
q. Critical Facilities.....	85
r. Hazardous Material Locations.....	86
s. Sample Press Release.....	87
t. After Action Review Form.....	88
u. Lessons Learned.....	89
C. Example Emergency Action Plan (orange spine)	90
D. Glossary.....	120

EMERGENCY ACTION PLAN

CHAPTER 1

INTRODUCTION

This box will be used to identify the minimum effort that could be undertaken in each of the sections. A thorough plan is best, but don't be overwhelmed and do nothing.

Introduction. The purpose of this document is to provide a step-by-step instruction to allow a small community or tribe to develop a flood emergency action plan (EAP). This template can be customized to fit each community's or tribe's situation with sections added or deleted as needed. The most important format is the one that works for you and will actually be used and updated.

Although other state and federal resources may be available during a flood, it is the

Lessons Learned:

“A plan does not cost anything, but not having a plan in place might cost an organization everything.” –H. Wayne Henderson Jr.¹

responsibility of each community to determine what actions are needed and what additional resources are required. The National Incident Management System (NIMS) should be adhered to as you develop your plan. This will ensure consistency and compatibility with other agencies' response plans as well as better utilization of incoming resources.



Photo: FEMA/David Fine

¹ Henderson, Wayne. “The Aftermath: Minimizing Disaster Impact.” www.facilitiesnet.com. Facility Maintenance Decisions. August 2012. Web. 29 October 2014.

Overview. The remaining chapters identify what critical items should be completed for the following topics:

- Identifying who has the authority
- Mutual aid agreements
- Personnel for flood organization
- Contacts
- Flood elevations and history
- Tasks and prioritized actions
- Emergency shelters
- Evacuation
- Utilities
- Critical facilities
- Hazardous materials
- Communications
- Training, exercises and mitigation planning

What this template does not include.

This template for creating an emergency action plan does not include details on flood fighting. There are a number of good resources (listed at the end of this Chapter and in Appendix A) that provide details on how to lay sandbags, determining the size of pumps needed for temporary pumping, and how to ring sand boils or broken pipes.



Photo: U.S. Army Corps of Engineers

Forms, Links, and Example EAP. At the end of each chapter you will find a list of fillable forms (included in Appendix B) that apply to the chapter, as well as a link to the list of available resources (included in Appendix A) that apply to the chapter. An example EAP can be found in Appendix C.

Personnel involved in preparing a plan. It is recommended that a committee be formed of 6-8 individuals that can meet monthly to develop a plan. This would include a commitment of 4-8 hours outside of meetings to work on individual assignments. These individuals could include:

- Community or tribe staff
- Elected officials
- Fire or police chief
- County emergency manager
- Consultants
- Volunteers such as local business owners, local contractors, or concerned citizens.

The eight month plan. Below is a sample schedule that could be used to create a flood emergency action plan. If started in August, a plan could be in place by March in time for the next spring flood, even allowing for a month to be skipped.

Month 1:

- Council approval to prepare plan
- Identify Team.

Month 2:

- First committee meeting
- Establish monthly meeting times

- Assign sections
- Become familiar with reference materials
- Focus on identifying personnel to be involved in the flood organization and creating an organizational chart.

Month 3:

- Review and confirm organizational chart
- Status reports on other sections.

Month 4:

- Reserved for seasonal holiday break if needed

Month 5:

- Reach consensus on mutual aid agreements needed
- Reach consensus on flood information to include in plan
- Brainstorm flood tasks.

Month 6:

- Review flood task worksheets
- Reach consensus on communications plan
- Reach consensus on sheltering plan
- Reach consensus on evacuation plan

Month 7:

- Complete draft plan for public review.
- Conduct public meetings

Month 8:

- Incorporate comments from public
- Finalize plan

- Council approval
- Implement plan

Communications in creating a flood

emergency action plan. In creating a flood emergency action plan it is important to make the plan available to the public and allow for a comment period. Elected officials, who are not already involved in the process, should be briefed and educated on the plan. This may require a working session be set aside specifically devoted to the plan.

Community Involvement. Before the plan is adopted by the council, there should be a public review period. This could include a public hearing or open house with a presentation by community or tribal staff.

Plan Updates. The flood emergency action plan is only as good as its latest update.

Good practices include:

- Maintaining a distribution list and using it to assure all previous versions are replaced when updated.
- Committing to updating the plan annually. People and phone numbers change. It should be included as a council agenda item annually to approve the update.
- Committing to incorporating lessons learned after every flood fight and updating all applicable sections as needed.



Photo: U.S. Army Corps of Engineers

<https://www.ferc.gov/industries/hydropower/safety/guidelines/eng-guide/chap6.pdf>

Forms: See Appendix B.

- Public meeting comment sheet
- Public meeting sign-in sheet.

List of Additional Resources

- Midwest Assistance Program Preparation Guide for Small Communities, Main document:

<https://www.countyofdane.com/emergency/flood/pdfs/Local%20Response%20Plan.pdf>
- FEMA’s “Developing and Maintaining Emergency Operations Plans” <https://www.fema.gov/media-library/assets/documents/25975?id=5697>
- California “Sample Flood Safety Plan”
http://www.water.ca.gov/floodsafe/docs/SampleFloodSafetyPlan-DraftMarch_2011.pdf
- Flood Emergency Response Plan for Individual Business
<http://www.lockton.com/Resource/PageResource/MKT/FERP%20Flood%20Plan.pdf>
- Flood Emergency Action Plans by FERC, Chapter 6

CHECKLIST

Chapter 1 Introduction

- Council approval to form committee
- Identify committee members
- Draft plan
- Public review
- Finalize plan
- Council approval
- Strategy for updating plan

EMERGENCY ACTION PLAN

CHAPTER 2 AUTHORITY

*If you only have time to do one thing for this chapter on **authority**, have an emergency declaration drafted and know how an emergency council meeting is called.*

Emergency Declaration. To obtain state assistance during a flood fight, it is often necessary for a local municipality, tribe, or county to first declare an emergency. This can be done in advance of a flood based on issued forecasts or other information. The Corps of Engineers can provide flood fighting resources once the state has declared that they have committed or anticipate committing all of their resources.

Federal Declaration. Once the state has activated their emergency response, the President of the United States can issue a Presidential Disaster Declaration upon request from the State Governor.

Lessons Learned: “In any moment of decision, the best thing you can do is the right thing, the next best thing is the wrong thing, and the worst thing you can do is nothing.” – Theodore Roosevelt

A Presidential declaration is usually based on the level of damages and triggers FEMA’s involvement in the disaster recovery.



Photo: FEMA/Jocelyn Augustino

Other Actions. Depending on the composition of the local government, it may be desirable to have other resolutions such as:

- Supporting the formation of a committee to prepare the emergency action plan;
- Adopting the final plan and committing to an annual update;

- Support of recommendations such as pay for volunteer fireman during a declared disaster;
- Adoption of mutual aid agreements with neighboring communities.

List of Additional Resources:

- None

Forms: See Appendix B.

- Sample resolutions

CHECKLIST

Chapter 2 - Authority

- Council support to develop emergency action plan**
- Council adoption of final plan**
- Emergency declaration drafted**

EMERGENCY ACTION PLAN

CHAPTER 3

MUTUAL AID AGREEMENTS

*If you only have time to do one thing for this chapter on **mutual aid agreements**, talk to the County about what mutual aid agreements may already be in place.*

Definition of Mutual Aid Agreements.

Mutual aid agreements are agreements between communities or tribes, or just about any agencies or organizations for that matter, that provide for the sharing of labor, equipment, and resources during an emergency. This allows for the quick response from a nearby location and has the added benefit of obtaining support from people familiar with the area and similar conditions. Fire Departments have successfully implemented mutual aid agreements for years. Mutual aid agreements should be in place prior to an emergency.

Lessons Learned:

“Mutual aid – help among neighbors – is an integral part of emergency response... Given the current economic and social climate, it is simply unrealistic to assume that a single community has all the resources required to cope with any and all emergencies it may face.” – Carolyn Perroni, Special Report: Multiple Aid: Lessons Learned from the California System²

The Need for Mutual Aid Agreements. A flood fight can quickly overwhelm the limited staff in a small community, especially when 24-hour operations are needed. Although adrenaline can take people far, lack of sleep will quickly impair judgment. Emergency response might require 24-hour attention for several days or longer, requiring multiple work shifts in a 24-hour period.

Another reason for having mutual aid agreements in place prior to the flood emergency is financial. If there is a national

² Perroni, Carolyn. “Special Report: Multiple Aid: Lessons Learned from the California System.” www.usfa.fema.gov. U.S. Fire Administration/FEMA, January, 1991. Web. 29 October 2014.

emergency declaration and flood fight and recovery expenses can be submitted to FEMA, mutual aid agreements will provide needed documentation of costs. If a near-by town “helped out” at the last minute with no agreement in place, reimbursement for their expenses will be difficult if not impossible.



Photo: FEMA/Michael Rieger

Areas Covered by Mutual Aid Agreements. Any area where a potential shortfall has been identified can be covered by a mutual aid agreement. For instance, if the volunteer fire department is overseeing the sandbag operation, it would be very disruptive if they needed to respond to a fire. Some areas that should be considered include:

- Fire and police
 - Engineering
 - Surveying
 - Water treatment and wastewater plant operators
 - Emergency Operation Center support, especially the night shift
 - Financial managers
- Materials such as sandbags and plastic
 - Equipment such as pumps, sandbagging machines and front end loaders.

Elements of Mutual Aid Agreements. Mutual aid agreements should contain a number of elements, including procedures for requesting assistance, notification protocols, and roles and responsibilities of individual parties. The National Incident Management System (NIMS) Core Document provides a complete list of the elements that should be included under Component I. Preparedness.

Development Process. Steps involved in developing a mutual aid agreement include:

- Identify potential partners and discuss the need for initiating a mutual aid agreement.
- Conduct conference calls or informal meetings to discuss a strategy for setting up an agreement.
- Obtain council authorization to initiate discussions.
- Establish a working group to work out the details.
- Contact county or state agencies for advice as needed.
- Draft agreement and have reviewed for legal sufficiency.
- Obtain council approval.

Emergency Management Assistance Compact (EMAC). This is a type of mutual aid agreement at the state level. The compact was ratified by Congress in 1996

and has been adopted by all 50 states. While a local community may not have direct contact, they may benefit from the arrangement between states. The Emergency Management Assistance Compact also has a large number of online training resources available.



Photo: FEMA/George Armstrong

List of Additional Resources:

- National Incident Management System (NIMS) Core Document: https://www.fema.gov/pdf/emergency/nims/NIMS_core.pdf
- Mutual Aid Lessons Learned from California <http://www.hsdl.org/?view&did=484122>
- EPA Mutual Aid Information <http://water.epa.gov/infrastructure/watersecurity/mutualaid/index.cfm>
- ASTHO Emergency Authority and Immunity Toolkit <http://www.astho.org/Programs/Preparedness/Public-Health-Emergency-Law/Emergency-Authority-and->

[Immunity-Toolkit/Mutual-Aid-and-Assistance-Agreements-Fact-Sheet/](#)

- King County Sample Mutual Aid Agreement http://www.google.com/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=1&cad=rja&uact=8&sqi=2&ved=0CCYQFjAA&url=http%3A%2F%2Fkingcounty.gov%2F~%2Fmedia%2Fsafety%2Fprepare%2Fdocuments%2FEMProfessionals_Plans%2FDebrisMgmtPlan%2FAppendix_X_Sample_Mutual_Aid_Agreement_Template.ashx&ei=Htl8U8HTF8WkyASK8YG4Dg&usg=AFQjCNHp9AItV6TX72nTdMRujdL9LBam3A
- Link to EMAC, Emergency Management Assistance Compact: <http://www.emacweb.org/?13>
- American Water Works Mutual Aid Agreements <http://www.awwa.org/portals/0/files/resources/water%20knowledge/rc%20emergency%20prep/rc%20warn%20resources%20pdf/warnactionplan.pdf>

Forms. None.

CHECKLIST

Chapter 3 – Mutual Aid

- Discuss Mutual Aid Agreements with County**
- Determine which agreements would be desirable**
- Contact neighboring communities**
- Mutual Aid Agreements approved by council**

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CHAPTER 4

**FLOOD ORGANIZATION
PERSONNEL**

*If you only have time to do one thing for this chapter on **personnel**, create a current phone list.*

Flood Response Personnel. It is critical to have a current phone list with home numbers, cell phone numbers, and email addresses for personnel involved in your flood response plan, and update it regularly. It is recommended that there be a process in place for contacting flood response personnel should an emergency occur or a situation deteriorates. One way is to establish a call tree where one person calls 3-5 people and they in turn each call 3-5 people. A form is included in Appendix B that could be used as an example.

Lessons Learned:

“Researchers . . . reported that sleep deprivation can have some of the same hazardous effects as being drunk. People who drove after being awake for 17–19 hours performed worse than those with a blood alcohol level of .05 percent. Another study suggested that performance begins to degrade after 16 hours awake, and 21 hours awake was equivalent to a blood alcohol content of .08 percent.” - Wikipedia³

Personnel Plan. It is important to decide who is in charge and has the authority to make decisions or obligate the community or tribe before the emotional and physical strain of the flood event occurs. A National Incident Management System (NIMS) - compliant personnel plan should be developed prior to flood season and be endorsed by the local council. Topics

³ Dawson, Drew and Reid, Kathryn. “Sleep Deprivation on Driving Ability.” *en.wikipedia.org*. British Medical Journal, 1997. Web. 29 October 2014.

Williamson AM, Feyer AM. “Sleep Deprivation on Driving Ability.” *En Wikipedia.org*. Occup Environ Med. 2000. Web. 29 October 2014

Planning and Intelligence. Some recommended positions under Planning and Intelligence include:

- Communications and Public Affairs
- Information Gathering and Reporting

Logistics. Recommended positions under Logistics include:

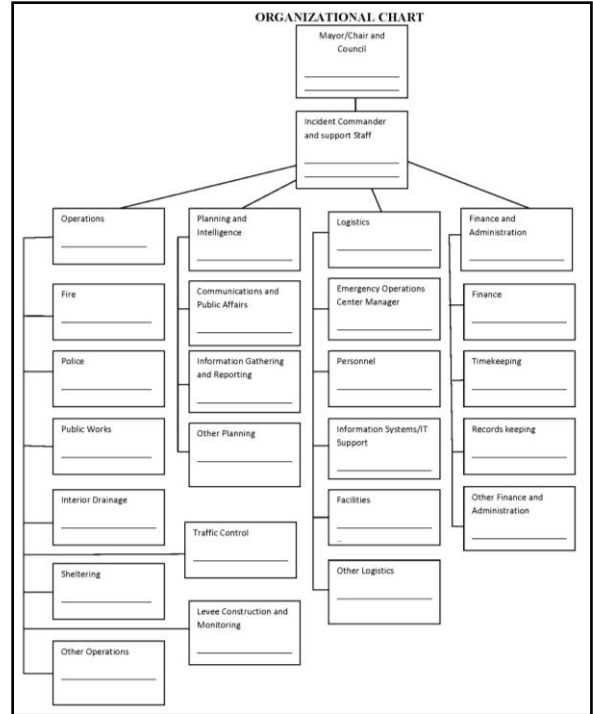
- Emergency Operations Center Manager
- Personnel
- Information Systems/IT Support
- Facilities

Finance and Administration.

Recommended positions under Finance and Administration include:

- Finance
- Timekeeping
- Records keeping

Organizational Chart. A sample organizational chart is included, recognizing that many small communities or tribes may have to double up on assignments or obtain outside assistance. For instance, the finance person may handle finance, timekeeping, and record keeping. The traffic control may be the National Guard.



Who Should Not Be Part of the Flood Fight Personnel Plan. It has been recommended that Mayors, Chairpersons, City Clerks, Public Works Directors, and Utility Superintendents be left to focus on their normal responsibilities and not be given additional responsibilities under the flood response personnel plan. It is recognized that they may be the most knowledgeable people in the city, so a realistic assessment should be made on a case by case basis.



Photo: FEMA/Marvin Nauman

Second Shift and Back-up. It is important that the personnel plan include staff for a second shift and backups for key positions. A 12-hour shift should be adhered to as closely as possible with some overlap at shift change. This will help to ensure people are rested and have the capacity to make good sound judgments. If the community does not have staff to cover both shifts, assistance should be requested from the County, the State, or by activating mutual aid agreements.

Pay for Assigned Positions. Consideration should be given to determining a pay scale for positions being filled by personnel not currently on the City payroll, such as volunteer firemen.

Family Preparedness Plans. Key personnel should be encouraged to have a plan in place for their own families. It is difficult for flood fighters to focus on their tasks if their own homes or families are in need of protection.

List of Additional Resources:

- Case Study of Incident Command Systems
<http://cra20.humansci.msstate.edu/Forum%20Forest%20Fires%20to%20Katrina.pdf>
- FEMA’s “Protect Your Property from Flooding”
<http://www.fema.gov/media-library/assets/documents/13261?id=3262>

Forms: See Appendix B.

- Personnel Phone List
- Call Tree
- Organizational Chart

Date: _____

CALL TREE FOR

Name: _____
 Number: _____
 Number: _____

Name: _____
 Number: _____
 Number: _____

Name: _____
 Number: _____
 Number: _____

Name: _____
 Number: _____
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CHECKLIST

Chapter 4 - Personnel

- Current Contact List**
- Call Tree**
- Organizational Chart**
- Second Shift Covered**
- Pay Approved**
- Family Preparedness Plans**

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CHAPTER 5

CONTACT LISTS

*If you only have time to do one thing for this chapter on **contacts**, ask the County for their list of contacts and add your own to it.*

Contact List. The contact list includes all the resources you may need outside of your personnel phone list. It is important that a community have a comprehensive contact list and update it on an annual basis. When creating the list, consider how useful it will be if you need to reach out on the Friday afternoon of a holiday weekend. Include website links. Include as many after-hour numbers and back-up numbers as possible.

Other Agencies. Your Contact List should include other agencies and organizations that you may deal with during a flood event. It is recommended

Lessons Learned: You should not need to introduce yourself to Agency representatives when they arrive at the Emergency Operations Center (EOC).

Relationships should be developed prior to the event so you already have an established working relationship and an understanding of what each Agency is bringing to the table.

- Advice given at an Alabama Hurricane Conference.

that the contact list be grouped by categories, such as:

- Federal water level and flood forecast information (National Weather Service, USGS gages)
- County (Emergency Management)
- Mutual aid contacts
- State
 - State Duty Officer
 - Homeland Security/Emergency Management

- Department of Natural Resources
- Department of Transportation
- National Guard

- Volunteer Organizations
- Ham radio operators
- Local Churches

- Other Federal
 - Corps of Engineers
 - FEMA
 - NWS
 - USGS
 - HUD
 - NRCS
 - BIA

- Utility Companies
 - Electric
 - Gas
 - Sewer and Water (if different from City)



Photo: FEMA News Photo

List of Additional Resources

- Corps of Engineers
<http://www.mvp.usace.army.mil/Missions/EmergencyManagement.aspx>
- USGS
<http://waterdata.usgs.gov/usa/nwis/rt>
- NWS
<http://water.weather.gov/ahps/forecasts.php>.
- General <http://www.ready.gov/>
- FEMA
<http://www.fema.gov/>



Photo: U.S. Army Corps of Engineers

- Other
 - Red Cross
 - Salvation Army

Forms: See Appendix B.

Outside Contacts

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CHAPTER 6

FLOOD ELEVATIONS, MAPPING, AND HISTORY

*If you only have time to do
one thing for this chapter
on flood elevations,
identify the nearest river
gage and know how to find
it on*

<http://water.weather.gov/ahps/forecasts.php>

Flood Gages. If you do not have the good luck of having a river gage right in your community or reservation, the first thing to do is identify the river gage nearest you or the closest upstream gage. This gage will be used to track rising river levels and what actions are needed in your area.

Stages vs. Elevation. River gages are sometimes given in stages instead of elevations, so it is important to know how they are related, especially if you have surveyors taking elevations of levees or low-

Lessons Learned:

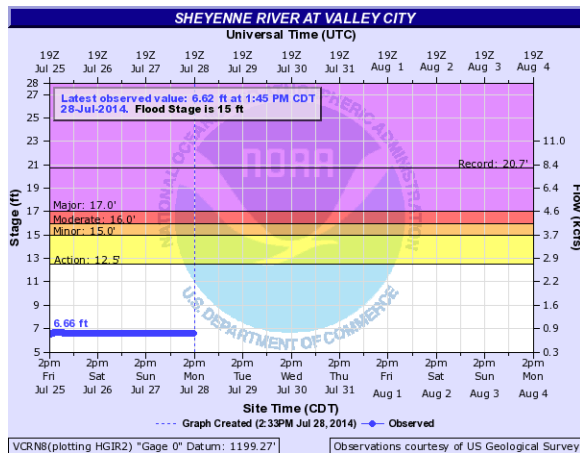
The phrase “100-year flood” is frequently used to describe a large event. It is more accurate to think of it as event having a 1 in 100 probability of occurring in any given year. This is also known as the 1% annual chance flood. Each year is independent, so even if you recently experienced a “100-year flood”, it could flood again this year to a similar level.

lying areas in your community. The National Weather Service Advanced Hydrologic Prediction Service websites will often list the stages at which infrastructure will begin to be impacted. If this is not available, this is information you will need to compile locally. The National Weather Service website includes information on the elevation of flood stages under the “metadata” tab.



Photo: U.S. Army Corps of Engineers

The metadata tab appears once you zoom in and select the hydrograph page for your desired gage location. Stage is converted to elevation by adding the gage zero listed in the metadata tab. Note that the gage zero elevation listed on this tab is in NGVD 1929. If necessary, it can be converted to NAVD 1988 as described in the next section.



Elevation Datums. Datums are reference points used in surveying. When dealing with elevations of levees or water, be aware there are different vertical elevation datums. Make sure the forecast flood elevation and the surveyed ground elevations in your community are being compared in the same datum. For the most part there is the National Geodetic Vertical Datum of 1929 (NGVD29) and the North American Vertical Datum of 1988 (NAVD88). Sometimes there can be more than a foot difference between the two.

Different federal agencies may use different datums. For instance, the Corps of Engineers built the embankments around the City of Devils Lake, ND using NAVD88,

but the USGS gages for lake levels are in NGVD29. The link below provides a utility to convert NGVD 1929 elevations to NAVD 1988 if necessary. Latitude and longitude, which can be obtained from Google Earth or Google Earth Pro, are required for the desired location. In addition, elevations must be entered as XXX.XX FT for a conversion in feet.

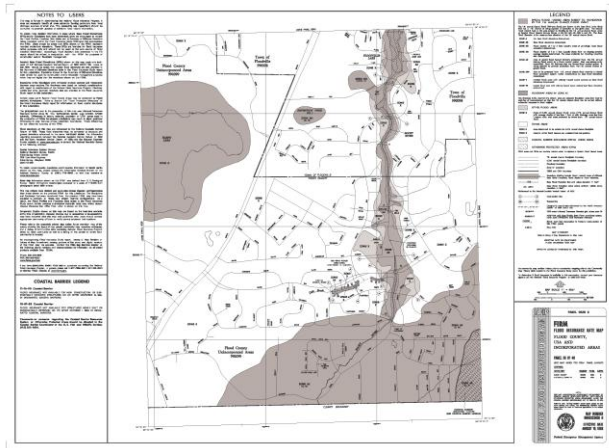
http://www.ngs.noaa.gov/cgi-bin/VERTCON/vert_con.prl

River Slope or Hydraulic Profile. Another elevation consideration is that rivers have slope and elevations decrease as you move downstream with the flow. It is important to recognize this slope if you are using a gage not near your location or even to know the slope from one end of your location to the other. As an example, during the Minot, ND flood of 2011, there was over 14 feet of slope on the river from the north end to the south end of the City, based on the slope of the river and the hydraulic losses along the river and across bridges (water backing up behind the bridges). The actual water surface matters because the levees upstream of the gage reading will need to be higher and the levees downstream of the gage reading can be lower.

It is recommended that you have a hydraulic profile developed for your location for future reference. Profiles may be available if a detailed flood insurance study has been developed for your location or county as described in the next section. Or it may require the involvement of a consultant or a state or federal agency. Start with your county or state emergency management

contact if you are in need of a hydraulic profile.

Floodplain Mapping and Profiles. If your community, tribe, or county participates in FEMA's flood insurance program, you will likely have flood insurance rate maps (FIRMs) that identify the floodway and floodplain for the 1% (100-year) and 0.2% (500-year) annual chance floods. The flood insurance study report will typically include profiles through your community or county for the 10% (10-year), 2% (50-year), 1% (100-year) and 0.2% (500-year) flood events. Your local floodplain administrator may have copies of the report and maps.



PDF files of older studies and maps are available at no charge online from the FEMA Map Service Center at the link below. Note that older studies are generally in the NGVD 1929 vertical datum.

[https://msc.fema.gov/webapp/wcs/stores/
vlet/FemaWelcomeView?storeId=10001&ca
talogId=10001&langId=-1](https://msc.fema.gov/webapp/wcs/storeservlet/FemaWelcomeView?storeId=10001&catalogId=10001&langId=-1)

If the flood insurance study was developed or updated recently, digital GIS-based maps

will be available at the link below. These newer maps are generally in the NAVD 1988 vertical datum.

[http://fema.maps.arcgis.com/home/webmap/
viewer.html?webmap=cbe088e7c8704464aa
0fc34eb99e7f30](http://fema.maps.arcgis.com/home/webmap/viewer.html?webmap=cbe088e7c8704464aa0fc34eb99e7f30)

It is important that low lying areas and roadways that could be subject to flooding be identified so the earliest impacted areas can be evacuated first.

Flood Inundation Maps. If your community is protected by levees or floodwalls, mapping should include the areas behind the levee that would be inundated if the levees or floodwalls were overtopped or damaged.

Topographical mapping. If you do not have staff that works with GIS (Geographic Information Systems) or that can create mapping it is worth hiring someone to provide you with a map with elevations and contours identified.

Some states have developed GIS topography for all or portions of the state which can be used to determine elevations and contours in your location or county. In states where this has been done, counties which have a GIS mapping website typically include the topography as a layer.

For instance, the state of Minnesota has developed statewide topography which is a layer in their GIS viewer. If you zoom in to your location or county, first ten-foot interval contours will be displayed and if you zoom in closer two foot interval

contours will display. This GIS viewer also allows you to obtain point elevations or a profile along a line that you enter. The contours and digital elevation model that the contours are based on can be downloaded and used in a local GIS map.

The link to the Minnesota topography can be found at:

<http://arcgis.dnr.state.mn.us/maps/mntopo/> for the tool

And

<http://www.dnr.state.mn.us/maps/mntopo/index.html>.



History. After a flood it is important to survey in high water marks so there is a history of what areas are impacted by the flooding. If the last flood occurred sometime in the past, it is important to capture and document personal knowledge of past floods. Some important elevations to include:

- Top of levees both upstream and downstream and key points in-between
- Lower chords of bridges
- Inverts of any pipes that discharge into the river
- Low areas of main roadways and evacuation routes
- The lowest flood elevation of critical facilities like rest homes
- Elevations at which flood fighting steps should be taken.

The elevations at which flood fighting steps should be taken will be discussed in the next chapter.

List of Additional Resources:

- Converting NGVD 1929 elevations to NAVD 1988:
https://www.ngs.noaa.gov/cgi-bin/VERTCON/vert_con.prl
- FEMA Map Service Center:
<https://msc.fema.gov/webapp/wcs/stores/servlet/FemaWelcomeView?storeId=10001&catalogId=10001&langId=-1>
- The link to Minnesota topography can be found at:
<http://arcgis.dnr.state.mn.us/maps/mntopo/> for the tool and
<http://www.dnr.state.mn.us/maps/mntopo/index.html>.
- Orange County CA Flood fighting advice
<http://ocflood.com/safety/fight/>

Forms: None

CHECKLIST

Chapter 6 - Flood

- Identify nearest river gage**
- Relate river stage to levee elevation**
- Hydraulic profile**
- Map of floodplain**
- Inundation map**
- Elevations of impacts**

EMERGENCY ACTION PLAN

CHAPTER 7

TASKS AND

PRIORITIZED ACTIONS

*If you only have time to do one thing for this chapter on **tasks**, brainstorm a list of tasks (like stormwater plugs) that needed to be accomplished in the last flood.*

Prioritized Tasks/Actions to be taken.

This chapter could be considered the most important chapter of the entire plan in the execution of a successful flood fight. Some of the tasks could include:

- Locations of temporary pumping
- Gatewell closures
- Activation of pump stations
- Sewer lift stations to be sandbagged
- Road closures and detour signage
- Sandbags and temporary levees
- Bridge closures if approaches low or low chords could become submerged.

Lessons Learned:

“Heavy rains and a rapidly rising Mississippi River caused headaches but didn't divert Davenport employees from the city's flood plan.

The city has a 400-step plan to fight flooding on the Mississippi River, now projected to reach a crest of 20.2 feet Sunday, more than 5 feet above the 15-foot flood stage in the Quad-Cities.

-Excerpt from 2013 Quad City Times story by Kurt Allemeier⁴

Page 1 of __

TASK SUMMARY LIST BY ELEVATION

This table is a summary of what actions need to be taken, the order they should be taken, and an estimated river stage at which the activity should happen. It also serves as the table of contents for the next set of worksheets. After each flood this list should be revisited to see if changes are recommended.

Task Worksheet No.	River Stage	Task	Notes
001	5	Close gate on stormwater discharges into river (3 locations)	Allow 1/2 day since may be iced in and need to be steamed out. See worksheets for details.

⁴ Allemeier, Kurt. “Davenport cranks up flood fight.” *qctimes.com*. Quad City Times, 18 April 2103. Web. 29 October 2014.

http://www.mvp.usace.army.mil/Portals/57/docs/Operations%20Center/CEMVP_Flood-Fight_Handbook_2009.pdf

Individual Task Worksheet. For each item that is to be completed, a separate task worksheet should be created. A sample form is included in Appendix B. Your public works director may have this all in his head, but now is the time to get it on paper. Each task should be described in enough detail that someone



Photo: U.S. Army Corps of Engineers

who has not accomplished it before can do so based on the information provided. Some of the items to be listed include:

- Tools required
- Materials needed to complete the task and their locations
- Estimated time to complete
- Estimated labor
- Photos, if helpful
- Flood stage at which the task needs to be completed
- Helpful hints or lessons learned from previous events.

List of Additional Resources:

- Corps of Engineers St. Paul District Flood Manual

Forms:

- Task summary list by elevation
- Task worksheet

Page 1 of 1

TASK WORKSHEET
TASK NO. 001
TASK TITLE: Close Gates to River

River Stage	5
Task Description	Close gates on stormwater discharges into river (3 locations).
Cautions:	Allow 1/2 day since may be iced in and need to be steamed out.

Detailed Task Description:
There are 3 gates that need to be securely closed before the river stage comes up. They are often iced in or may have debris blocking them from completely closing. The 3 gates are located as follows:
1) Approximately 15 feet down the riverbank, near the intersection of 4th and Elm.
2) Behind the Quick Fix Shop on Forest. May need to ask the Quick Fix (Steve 724-8853) to move parked vehicles.
3) Near the Main Street Bridge on the East Side. May need to plow approach to reach.

Equipment and Personnel Needed:
Two people, on-half day, pick-up with plow, portable steamer, hand tools.

Photos:

CHECKLIST

Chapter 7 - Tasks

Task list

Complete task worksheets

EMERGENCY ACTION PLAN

CHAPTER 8

EMERGENCY SHELTERS

If you only have time to do one thing for this chapter on shelters, answer this: Where will you direct people to go when the sirens go off?

Lesson Learned:
Communities that have required sheltering report that if there is a chance a shelter may be needed, it cannot be started too soon. A plan should be in place in case outside resources like the Red Cross are overwhelmed and cannot respond immediately.

Objective. In this chapter the basics of identifying emergency shelters are outlined. It is important that at least one location be identified as a shelter prior to a flood event, and that people know where to go in the event the sirens go off or an evacuation is declared.



Photo: FEMA/Andrea Booher

Resources. The Red Cross, the Salvation Army, and other organizations are often available to help establish shelters. Pre-disaster coordination is critical. Initially the local community may be the only resource available until reinforcements arrive.

Last Updated: 28 July 2014

SUMMARY OF SHELTERS

The following locations are identified for shelters: short term, long term, and for pets.

Location	Elevation	Point of Contact	Phone numbers	Email
Lutheran Church	1460	Rev. John Doe	721-444-1212	John.Doe@first.Lutheran.com
Short-Term				
Long-Term				
Pets				

Short-term and long-term sheltering.

Both a short-term location and a longer term location should be considered. For longer term use, a location for people to shelter overnight should be identified. In some cases, the best shelter might be outside the flooding community.

Considerations. Possible facilities include schools, churches, and community centers. Schools make good shelters, but can result in conflicts as the return of classes can be the first step in the return to normalcy after a flood. Some considerations include:

- The elevation of the facility especially if it is located behind a levee
- Handicap accessibility
- Basic fire protection like fire extinguishers
- Allow for approximately 20-40 square feet per person
- Have a minimum of 1 toilet for every 40 people
- Ideally showers and kitchens are desirable, but not critical.
- The facility should not be susceptible to sewer and water interruptions, and should have a back-up generator.

Site Name: _____	
Date: _____	
EVALUATION OF SHELTERS	
<small><i>It is intended that this form be completed to the maximum extent possible for each shelter evaluated. Then all evaluations should be reviewed by the committee, shelters selected, and arrangements made to utilize the location if ever needed.</i></small>	
Name of Location:	
Address of Location:	
Date Evaluated:	
Team Evaluating:	
Point of Contact for Site: (Name, Position, Phone)	
EVALUATION FACTORS	
Short-Term, Long-Term, or for Pets?	
Estimated People That Could Be Accommodated? (20-40 sq ft per person)	
Is Facility Behind Levee?	
Elevation of Facility:	
Handicap Accessible?	
Number of Toilets? (minimum 1 toilet per 40 people)	
Number of Showers?	
Kitchen Available?	
Is Back-up Generator Available?	
Would Location be Susceptible to Water or Sewer Back-up?	
Comments and Recommendations:	

Services. Evacuees in a shelter will need a full range of services that could include meals, bedding, clothing, crisis counseling, medical attention, mental health services, child care, transportation, phone and internet access. The elderly and disabled may have special needs. Registration of all evacuees should be required to ensure the security of the site.



Photo: FEMA/David Saville

Pets. Since Hurricane Katrina, the importance of allowing for the sheltering of pets has been realized. Many people would

risk jeopardizing their own lives rather than leaving their pets behind. Pets need to be housed in an area separate from people, either off-site or a separate part of the facility. Except for guide dogs, pets should not be allowed to mingle with evacuees due to potential allergy issues, bite risks, and other disruptive effects.

More Details. A form for evaluating different options for shelters is included in Appendix B. Links to some examples of other sheltering plans are listed below and included in Appendix A.

List of Additional Resources:

- Shelter Guidance and Shelter Staff Matrix
<http://nationalmasscarestrategy.org/shelter/>
- Red Cross Shelters – Alameda County, CA
http://www.cdc.gov/nceh/ehs/Docs/Guide_for_Local_Jurisdictions_Care_and_Shelter_Planning.pdf
- Pet Evacuation Guidelines from FEMA
<http://www.fema.gov/plan/prepare/animals.shtm>
- Livestock Evacuation Guidelines from the University of Vermont:
http://www.uvm.edu/~ascibios/?Page=Emergency/Disaster_Planning_for_Livestock.html&SM=submenuemergency.html
- Animal sheltering lessons learned
http://www.lsart.org/site/view/107339_EmergencyShelters.pml

- ASCE Article on lessons learned
[http://ascelibrary.org/doi/abs/10.1061/\(ASCE\)NH.1527-6996.0000055](http://ascelibrary.org/doi/abs/10.1061/(ASCE)NH.1527-6996.0000055)

Forms.

- Evaluation of shelters
- Summary of shelters

<p style="text-align: center;">CHECKLIST</p> <p style="text-align: center;"><u>Chapter 8 - Shelter</u></p> <ul style="list-style-type: none"><input type="checkbox"/> Identify potential sites<input type="checkbox"/> Determine elevations of sites<input type="checkbox"/> Contact facility owners and complete evaluations<input type="checkbox"/> Establish contact with local Red Cross<input type="checkbox"/> Agree on short and long term sheltering sites.
--

EMERGENCY ACTION PLAN

CHAPTER 9 EVACUATION

*If you only have time to do one thing for this chapter on **evacuation**, answer this: Who has the authority to make the decision to evacuate?*



Photo: U.S. Department of Defense/Sgt. Joseph VonNida

Evacuation authority. All states give Governors the authority to order evacuations. However, the way in which that authority is delegated down to counties and cities varies by state. Local ordinances usually specify that the County Emergency Manager has the authority. It is important

that the person with the authority be firmly established before an emergency event and

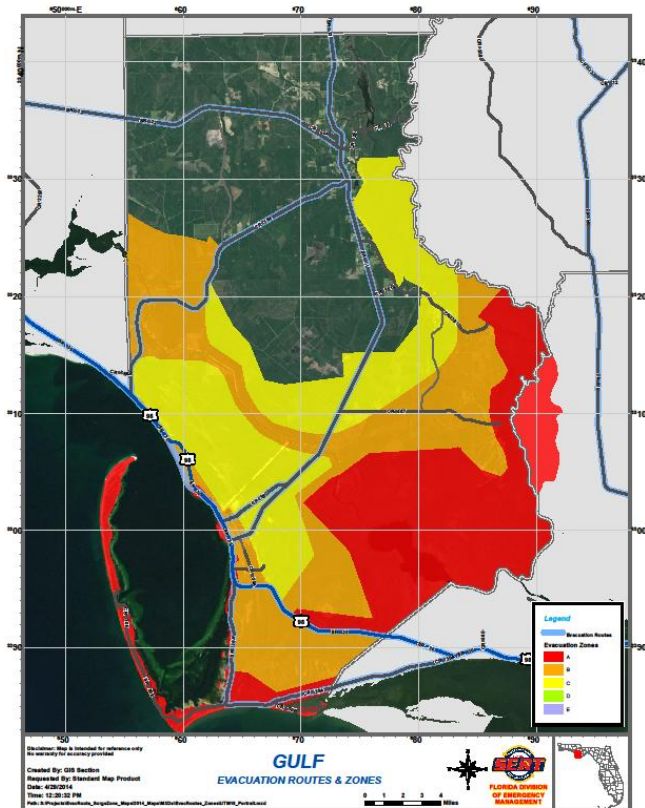
Lesson Learned: During a flood, a small community identified a potential levee break and the sirens were activated at 6 AM in the morning. People were directed to seek high ground and told to go to the ball field. Unfortunately this was the same location that was being used as a borrow pit for the levee material. Mixing fleeing residents and dump trucks hauling clay to the levees made for an unsafe situation.

not subject to debate during the stress of the flood event.

Voluntary vs. Mandatory Evacuations.

Much has been written on the difference between voluntary and mandatory evacuations. Some states and counties declare a mandatory evacuation to emphasize the seriousness of the evacuation. Residents may be told that rescue resources will not be available if they do not evacuate or they will be responsible for the expense. Check your state and local laws to determine what types of evacuations are legal to order.

Evacuation Zones. Except for possibly the smallest of communities, it is recommended that each community have a map divided into zones based on elevations of the homes, elevation of the roads, and locations of levee construction. This map should be well publicized so that when an evacuation is required, residents can quickly identify their zone. This same map can be used to allow people to return to their homes.



5

Establishing Evacuation Zones. The flood plain map from a flood insurance study is a good tool to begin with. Start at the river and divide the area using natural neighborhood divisions, considering the risk

⁵ GIS Section. "Gulf Evacuation Routes & Zones." www.floridadisaster.org. Florida Division of Emergency Management, 29 April 2014. Web. 29 October 2014.

of flooding for each area. Depending on the number of homes involved and the elevations involved, you may want to include the homes adjacent to the river in one zone and the next band of homes in a separate zone. Keep in mind that low-lying areas protected by levees could be flooded if there is a breach or flooded from interior drainage if storm sewer pipes to the river have been plugged and pumping has not been able to keep up with rain or snowmelt. An example is shown on this page and included in a larger size in Appendix B.

Routes and elevations. Based on past experience and also by reviewing a map with elevations, any low lying areas that may flood should be identified and taken into consideration with evacuation routes. Often bridges are high enough, but the approaches are low and flood out first. All routes need to be evaluated for viability considering past and expected future flood levels. The public needs to be made aware of the routes, and if their part of town is assigned to any particular route.

Traffic Control and Safety. Prior to issuing an evacuation order, the routes should be confirmed as passable and traffic control should be assigned and in place. Public Works or the Department of Transportation should be coordinated with to determine where barricades may be required. People should be reminded to not drive through flooded roadways. The National Weather Service has a campaign called "Turn Around, Don't Drown" to warn people against walking or driving through water. Materials for educating the public and recommended signage are available at

List of Additional Resources:

- Vulnerable Residents Registration
<https://webapps.broward.org/VulnerableRegistry/Welcome.aspx>
- Ramsey County Registration
<http://www.co.ramsey.mn.us/NR/rdonlyres/59835B15-BA12-4DC9-B66E-C1E24743ADC6/22483/ResidentailEmergencyInfoForm0211.pdf>
- City of Chicago Registration
<https://webapps1.cityofchicago.org/volunteerregistry/checkDisclaimer.do>
- Health Affairs Evacuation – the challenge of mandatory evacuations
<http://content.healthaffairs.org/content/25/4/958.full>
- California information on evacuations
http://www.google.com/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=1&ved=0CCYQFjAA&url=http%3A%2F%2Fwww.calema.ca.gov%2Fplanningandpreparedness%2Fdocuments%2Fevacuation.pdf&ei=cx88U-eREKLs2QXCI4GgCA&usg=AFQjCNEQmMAfdkNu_tVGXj0IwzPX6WI04w&bvm=bv.63934634,d.cWc
- National Weather Service Campaign “Turn Around, Don’t Drown”
<http://www.nws.noaa.gov/os/water/ta dd>

Forms.

- Special Needs Registry
- Special Needs Registry Waiver
- Evacuation zone example

CHECKLIST

Chapter 9 - Evacuation

- Establish who has the authority
- Determine how the decision will be made
- Evacuation zones
- Evacuation routes
- Traffic control plan
- Public notification
- Special Needs Registration.

EMERGENCY ACTION PLAN

CHAPTER 10

UTILITIES

*If you only have time to do one thing for this chapter on **utilities**, prepare a list of utility providers, current points of contact, and after hours phone numbers.*

Overview. During a flood emergency, many utilities may be affected. It is crucial to understand what utilities are in your area and how to coordinate with the providers.

Points of Contact. The most critical item in this chapter is to have a good current list of all utility providers with points of contact and after hour phone numbers. Some companies have complex business organizations with subsidiaries and it can be difficult to track down who will be responsible in an emergency. Others may have offices that are located hours away or in the next state. Identifying the proper process for contacting each provider as part

Lesson Learned: During the Minot flood of 2011, the raging river put so much pressure on the storm water plugs that several were blown out, causing the City to flood from the inside. Massive ring levees, around multiple homes and as high as the rooftops, were required to equalize the pressure with the river. The extreme amount of water pressure that might be encountered needs to be considered during the early process of plugging storm sewers that discharge to the river.

of your emergency action plan can save undue frustration during the flood.



Photo: U.S. Army Corps of Engineers

Coordination with Utility Providers. In most events your primary coordination will be to notify utilities of flooding. But you may need to work closely with them if levee construction conflicts with their lines. There may need to be priorities established. And once the threat of flooding has passed, there will be the coordination of any repairs and getting services restored as quickly as possible.



Photo: FEMA/Jocelyn Augustino

Electrical Service. Without electrical power, residents cannot run their sump pumps. City pump stations and lift stations may also be impacted. Part of this emergency action plan should include discussions with the power company regarding the elevations of transfer stations or substations and their plan for maintaining or restoring services during a flood.

Generators. Although there is a cost associated with maintaining generators in working order, investing in back-up generators is strongly recommended. Electrical power is critical to most operations but may not be available even if the facility is not directly impacted by floodwaters. Back-up generators are usually the solution to the continuing operation of most facilities. But it is not just a simple

matter of checking the box. Some questions that should be asked and planned for include:

- Is there a high level of confidence that the generator can perform for multiple days, not just a few hours?
- Is the expected load on the generator realistic? Has it been updated recently?
- Are on-site staff familiar with the operation and trouble shooting of the generator? Many facilities may contract out the maintenance and those personnel may not be available.
- Is there a realistic plan for refueling the generators? Will the fuel truck be cut off from the facility by the floodwaters?

Gas Service. Broken gas lines can result in fires in the midst of flooding. A discussion with the gas company should include the location of shut off valves and which lines may be impacted by floodwaters.



Photo: FEMA/Wendell Davis Jr.

Sanitary Sewer. Floodwaters or even high ground water can significantly increase the amount of infiltration into sewer pipes and overwhelm lift stations and even the sewage

treatment plant. The elevation of all lift stations should be known, including the elevations of the access. If the system is overwhelmed it may be necessary to get permission from the Health Department to bypass treatment and discharge directly into the river. If this happens, restrictions should be placed on residents to minimize use and porta-potties should be brought in. As part of on-going mitigation, lines known to be vulnerable should be upgraded as part of a regular capital improvements program.

Water Lines. Crushed or damaged water lines can result in leakage to the point of pressure loss. This creates a very dangerous fire fighting situation. Having a good map of shut-off valves and the location of water lines in the floodway should be part of this plan.



Photo: FEMA/Steve Zumwalt

Storm water. Flooding from improperly plugged storm water lines connected to the river can be one of the biggest threats to a successful flood fight. Lines considered successfully plugged can be compromised by the high pressure of the rising river levels. Once compromised, the area will need to be ringed with sandbags or clay so the water can seek its own level and be

stabilized. If all discharge lines to the river have been successfully plugged, then this also means all interior drainage must be pumped over the levees into the river. The emergency action plan should include a plan for identifying locations to be pumped, the amount of pumping anticipated, and other details such as type of pumps, length of hose needed, and where the water is to be pumped.

Telephone Companies. Coordinate with local cell phone providers ahead of time and understand the resources they may be able to provide in the event of flooding. Some companies have portable units that can be brought in if towers are damaged or overwhelmed.

List of Additional Resources:

- None

Forms.

- No separate form for this chapter – utility contacts should be included on the main contacts list.

CHECKLIST

Chapter 10 - Utilities

- List of utility points of contact**
- Discussions with utility companies regarding their plan during emergencies**
- Back-up generators**
- Plan for sanitary sewer infiltration**
- Maps of water shut-off valves**
- Plan for plugging stormwater outlets**
- Plan for pumping interior drainage**
- Back-up for cell phone service.**

EMERGENCY ACTION PLAN

CHAPTER 11 CRITICAL FACILITIES

*If you only have time to do one thing for this chapter on **critical facilities**: Make a list of critical facilities in your area with an after hour's point of contact for each.*

Definition. Critical Facilities are defined as facilities from which essential services and functions for victim survival, continuation of public safety actions, and disaster recovery are provided. Examples would include:

- Emergency operations center
- Fire stations
- Law enforcement centers
- Hospitals
- Nursing Homes
- Water treatment plants and public drinking water supplies
- Sewer and wastewater facilities
- Schools
- Shelters

- Power plants and substations
- Sites with hazardous materials

Lessons Learned: Over 49 percent of the deaths following Hurricane Katrina were persons over 75 years old. “Future disaster preparedness efforts must focus on evacuating and caring for vulnerable populations, including those in hospitals, long term care facilities, and personal residences.”

Article by
Brunkard, Namulanda, and
Ratard for Disaster Medicine
and Public Health
Preparedness.⁶

Individual Plans for Community Facilities. Facilities under the direct control of the community or tribe, such as fire stations and law enforcement centers should have individual plans that address alternate work sites. It is recommended that the community or tribe have a continuity of operations plan that could include the plans for these individual critical facilities.

⁶ Brunkard, Joan and Namulanda, Gonza and Ratard, Raoult. “Hurricane Katrina Deaths, Louisiana, 2005.” *dhh.louisiana.gov*. Medicine and Public Health Preparedness Journal, 28 August 2008. Web. 29 October 2014.

Individual Plans for Facilities Under the Control of Other Agencies. Other facilities such as hospitals and schools should have their own plans and take into consideration that resources in the region may be limited.



Photo: U.S. Army Corps of Engineers

Alternate Site for the Emergency Operation Center. An alternate site for the emergency operation center is recommended since the primary facility could be impacted by the disaster just as other structures. Considerations include good communication equipment, work stations, a generator for back-up power, and facilities for meal preparation and cots if necessary.

Unique Facilities. Any unique properties should also be encouraged to have an individual plan. As an example, in recent years there have been instances of local zoos that needed to be evacuated due to flooding.

Don't Underestimate Resources Needed. During the Minot, ND Flood of 2011, the decision was made to evacuate a nursing home. Two hundred and thirty-one residents were relocated to 26 other facilities or to family members. A North Dakota Department of Health press release reported that they were deploying transportation assets to include one stretcher bus, five

wheelchair buses and 17 wheelchair vans. Care should be taken to not underestimate the resources that may be required.

Generators. Electrical power is critical to most operations but may not be available even if the facility is not directly impacted by floodwaters. Back-up generators are discussed in more detail under the utilities sections. The Corps of Engineers hosts an online database of power requirements for critical facilities. Critical facility owners can register and submit their facility requirements. The link to this database is included under “Links to Additional Resources”.



Photo: U.S. Army Corps of Engineers

List of Additional Resources:

- Emergency Power Facility Assessment Tool:
<http://epfat.swf.usace.army.mil/>
- State of Florida Standard Operating Procedures for Critical Facilities:
<http://www.training.fema.gov/EMIWeb/edu/docs/HistoricalInterest/Florida%20Division%20of%20EM%20-%20CFI-RSFI,%20Standard%20Operating%20Guidel.doc>

**EMERGENCY ACTION
PLAN**

CHAPTER 12

HAZARDOUS MATERIALS

*If you only have time to do one thing for this chapter on **hazardous materials**: Have a list of businesses, city or tribal buildings, and other facilities that work with hazardous materials and a good afterhours point of contact for each.*

Background. Hazardous materials have the potential to make an emergency even more dangerous. Materials are considered hazardous if they:

- Corrode other materials
- Explode or are easily ignited
- React strongly with water
- Are unstable when exposed to heat or shock
- Are toxic to humans, animals, or the environment.

Lessons Learned:

Reducing spills from service stations or convenience stores: Underground storage tanks are the responsibility of the owner, not community/tribe staff or officials. Tanks not anchored can float out of the ground when subjected to high floodwaters or even high groundwater. EPA has created a guide and checklist for steps to take before and after a flood.

Identifying Possible Locations. As part of your Emergency Action Plan, you will want to identify business and facilities that have potentially hazardous materials. A form is included to facilitate capturing this information. These could include fuel storage and underground tanks, herbicides, pesticides, water treatment chemicals, and lubricants to name a few examples. In rural areas, agriculture-related businesses might have fertilizers and other chemicals. Often agencies that keep such records include the fire department, the county emergency management department, or the state pollution control offices.

EMERGENCY ACTION PLAN

CHAPTER 13

COMMUNICATIONS

*If you only have time to do one thing for this chapter on **communications**, decide who will be the designated spokesperson and commit to frequent communications with the public.*

Background. Communications are critical to the success of a flood event response. The National Incident Management System (NIMS) specifies that communications should be interoperable, reliable, scalable, portable, resilient, and redundant.

Communications Plan. As part of the overall flood emergency action plan, it is recommended that all the tasks discussed in this chapter be captured in a document referred to as a Communications Plan. A thorough communications plan can be as extensive as this entire emergency action plan and is something to strive for. In the meantime the items discussed in this chapter will be a starting point.

Lessons Learned: “The first casualty of a crisis is information. Make sure you have the facts before you act. Talk to the folks in the field. Share relevant information with the emergency response directors. Let the public know what you know through updates and guidance from your experts. You cannot communicate too much.” - Deb Markowitz, Secretary of the Vermont Agency of Natural Resources on advice to the state of Colorado.⁷

Communications during a flood. It is important that information be provided frequently and through as many means as possible during a flood. Misinformation and rumors should be dealt with directly. All information being released should go through one person in the Emergency Operations Center, the designated spokesperson, to assure conflicting information is not being distributed.

⁷ Markowitz, Deb. “What we learned from Vermont’s epic flood.” *cnn.com*. CNN Opinion, 16 September 2013. Web. 19 March 2014.

Designated spokesperson or public information officer. A person should be designated that will handle press releases, coordinate information being released, and be the point of contact for reporters and media requests. A small community or tribe that is already short staffed should request assistance if they have no one to serve this role. This person would be in addition to the Mayor or Chairperson who will be speaking at press conferences and assuring the public that they are being provided with the most current and accurate information.

Methods of communicating. Below are several means of communicating with the public.

- **Press releases.** Press releases should include links where people can find additional information. Sample press releases are attached.
- **Radio and Television.** Local radio and television have been instrumental in keeping the public informed in the past, but need to be provided with up-to-date information.
- **Reverse 911.** This system allows for pre-recorded messages to be sent to all phones in a specified geographic area. Unlisted numbers and cell phones can be registered as part of the system. Since many households, particularly of the younger generation, no longer maintain a hard line telephone it is important to encourage people to register ahead of time.

- **Social Media.** Social media use has increased exponentially in the past few years. In response, the U.S. Department of Homeland Security's Science and Technology Directorate (DHS S&T) established the Virtual Social Media Working Group (VSMWG) in December 2010 and has since published a guide and lessons learned from Hurricane Sandy on using social media. A link to this report is provided.



Photo: FEMA/Christopher Mardorf

- **Radio Amateur Civil Emergency Services (RACE).** This is a volunteer organization of licensed amateur radio operators organized under FEMA and the FCC. Ham radios have a long history of providing support during disasters and should be a part of every back-up plan. As a minimum it may be beneficial to make contact with the ham radio users in your area.

Interoperability. In past large disasters like Hurricane Katrina, one of the key lessons learned has been that it is critical that first responders be able to talk to each other and

to the emergency operations center, even with the loss of power. It is vital that the emergency operations center be able to communicate with people in the field. It may be as straight forward as acquiring spare radios that can be distributed during an event. What's important is that you understand your current means of communication and talk through what your plan – and backup plan - will be. Links are provided to lessons learned from other communities.



Photo: FEMA/Bradley Carroll

Incident Management Software. States use incident management software to track reports from local emergency operations centers to the state emergency operation center. Incident management software has the added advantage of tracking requests and allowing a wide range of agencies to have access to view requests and reports. From the local perspective, it is important to be familiar with your state's software as it may be the required means for requesting resources and materials. Most states offer free on-line training. If you find yourself in a flood emergency and do not have someone familiar with this system you may want to request a person from the County or State to

help you. Links to Minnesota's DisasterLAN (DLAN) software and North Dakota's WebEOC software are included in the "Links to Additional Resources" section.

Communication Tools at the Emergency Operations Center. Three invaluable tools at the EOC are a high quality speaker phone, a conference call-in number, and the ability to conduct a web-meeting.

- A high quality speaker phone with satellite speakers is crucial when a large number of the members at the EOC want to be involved in a call with state or federal officials or staff in the field. Make sure the system is compatible with the phone system in the EOC.
- A call-in number, usually a toll-free number with an access code, can allow multiple callers to participate in a virtual meeting.
- The third tool, the ability to conduct web meetings, is the next level of technology and allows a virtual meeting to view the same documents and maps on line and share sketches. Often state and federal agencies will have these resources, but the use is limited by local availability.

List of Additional Resources:

- Minnesota DLAN:
<http://www.mngeo.state.mn.us/councils/stategovt/DLANUserRegistrationAndBrief101909.pdf>

- North Dakota WebEOC:
<http://www.nd.gov/des/planning/web-eoc-training/>
- Social Media and Hurricane Sandy: Lessons Learned
https://communities.firstresponder.gov/DHS_VSMWG_Lessons_Learned_Social_Media_and_Hurricane_Sandy_Formatted_June_2013_FINAL.pdf
- Evaluating amateur radio operators
<http://www.usfa.fema.gov/pdf/efop/efo37991.pdf>

Sample communications plan:
http://www.nvcc.edu/about-nova/emergency/CrisisCommunicationProtocols_11_03_14-Final.pdf

Forms.

- Sample press releases

SAMPLE PRESS RELEASES
<p>Draft Public Announcement Message 1</p> <p>The National Weather Service has issued a flood warning that includes the community/tribe of _____. This means that high water along the _____ river and the levee is very likely. Residents in low lying areas should review their personal evacuation plans remain vigilant to updates. The _____ will provide updates to the radio and television stations as well as on facebook and at the _____ website at _____.</p>
<p>Draft Public Announcement Message 2</p> <p>The National Weather Service forecast for the _____ river indicates the overtopping of the levees is a possibility. Raising the levees is ongoing around the clock. However, residents, particularly in low lying area, are encouraged to consider voluntarily evacuating to higher ground. The _____ will provide updates to the radio and television stations as well as on facebook and at the _____ website at _____.</p>
<p>Draft Public Announcement Message 3</p> <p>The levees are in eminent danger of failure. The area of _____ or evacuation zones _____ are under a mandatory evacuation order. All residents in these areas are directed to move to higher ground immediately. The _____ will provide updates to the radio and television stations as well as on facebook and at the _____ website at _____.</p>

CHECKLIST

Chapter 13 - Communications

- Public review for Emergency Action Plan**
- Designated spokesperson**
- Sample press releases**
- Reverse 911 system in place**
- Plan on how to use social media**
- Ham operators contacted**
- Confirm interoperability between radio systems**
- Incident Management Software Training**
- Acquire speaker phone and call-in number for conference calls.**

EMERGENCY ACTION PLAN

CHAPTER 14

TRAINING AND EXERCISES

*If you only have time to do one thing for this chapter on **training**: Gather your team, assume a flood scenario, and talk through the steps you would take to fight a flood. This is a tabletop exercise.*

Background. There are management systems in place that are to be used at all levels of government during a flood fight or any emergency. What is important to know is that the local government is responsible for taking command. Local staff and elected officials should be trained on the following topics.

National Incident Management System. Since the September 11 terrorist attacks and the 2004 and 2005 hurricane seasons, it became clear that a comprehensive approach to emergency responses was needed that would address all disasters, at all levels of

government, and across all functional disciplines. The National Incident Management System, or NIMS, spells out how this approach is to work. It is important that local communities understand their role, speak the language, and know how to ask for what they need during a flood emergency.

Lessons Learned:

“We can never do too much planning, training, and evaluation, and repeat that cycle again. Individual, company, and department competencies must be ensured through training, practice, exercises, honest evaluation, and leadership. Roles and responsibilities must be known and practiced pre-event.” -2011 Southeastern Tornadoes Report. (Following Joplin, MO tornado)⁸

Incident Command Systems (ICS). ICS evolved from an approach developed in California in the 1970’s by firefighters that saw the importance in being able to manage a response across multiple jurisdictional boundaries. Management of the flood

⁸ Lawrence, Cortez. “Fire Service Operations for the Southeastern Tornadoes – April 2011.” www.usfa.fema.gov. FEMA, April 2012. Web. 31 October 2013.

response is always at the local level, with expansion as needed. The key characteristics of the incident command system include:

- Common terminology
- Management by objectives
- Comprehensive resource management
- Integrated Communications
- Unified Command
- Accountability
- Information and Intelligence Management



Photo: FEMA/Marilee Caliendo

FEMA Training. FEMA offers free on-line training courses tailored towards emergency response and recovery personnel, including the National Incident Management System (NIMS) and Incident Command Systems (ICS). Many state departments of emergency management make training in a classroom setting available at minimum or no cost. This can be a good opportunity to network with representatives from other communities or tribes.



Photo: FEMA/Jocelyn Augustino

Tabletop Exercises. One of the best exercises is a tabletop exercise. A facilitator is recommended, a problem is presented, and the participants talk through the process and identify potential areas for improvement. The exercise should always include a way for recommended improvements to be made to the current plan.

List of Additional Resources:

- FEMA training is available at <https://training.fema.gov/IS/>
- National Response Framework <http://www.fema.gov/national-response-framework>
- FEMA Table Top Exercise <http://usasearch.fema.gov/search?query=unit+5+tabletop+exercise&op=Search&affiliate=fema>
- Guide to a Successful Table Top Exercise <http://www.preparis.com/blog/guide-to-successful-tabletop-exercises/>

- Training available through the Emergency Management Assistance Compact (EMAC):
<http://www.emacweb.org/index.php/rainingeducation/>

Forms: None

CHECKLIST

Chapter 14 - Training

- National Incident Management System Training completed**
- Training through FEMA or the State EOC completed**
- Tabletop exercise scheduled**

EMERGENCY ACTION PLAN

CHAPTER 15

MITIGATION, FLOODPLAIN MANAGEMENT AND INSURANCE: LESSONS LEARNED

If you only have time to do one thing for this chapter on lessons learned: Make sure your community or tribe is eligible for flood insurance (available through the National Flood Insurance Program (NFIP) and residents are encouraged to purchase.

Summary. In this chapter lessons learned will be presented on:

- Flood Fighting
- Recovery
- Flood insurance.

Flood insurance. It is important that residents are protected by separate flood insurance as flooding is not covered by typical homeowners insurance. This needs

to be done in advance of flooding since there is usually a 30-day waiting period from date of purchase before the policy goes into effect.

Lessons Learned: Some communities such as Grand Forks, ND after the 1997 flood and Greensburg, KS after the 2007 tornado took the opportunity to rebuild and be better than before. Rather than focusing on reclaiming what they had lost, they focused on how they could use the opportunities to build a better future.



Photo: U.S. Army Corps of Engineers



Photo: U.S. Army Corps of Engineers

National Flood Insurance Program. This is a federal program created by Congress and managed by FEMA. The purpose is to mitigate future flood losses nationwide through sound, community-enforced building and zoning ordinances and to provide access to affordable, federally backed flood insurance protection for property owners. Participation in the program is based on an agreement between local communities and the Federal Government that states that if a community or tribe will adopt and enforce a floodplain management ordinance to reduce future flood risks to new construction in Special Flood Hazard Areas, the Federal Government will make flood insurance available as a financial protection against flood losses. After a community or tribe joins the program, a policy may be purchased from any licensed property insurance agent or broker. The agent will complete the flood insurance application, obtain the proper supporting documentation required, and determine the rates for establishing the flood insurance premium.

National Flood Insurance Program's Community Rating System. This system recognizes a community's or tribe's efforts that go beyond the minimum standards of the National Flood Insurance Program

(NFIP) and reduces flood insurance premiums for property owners. Discounts of 5-45 percent are possible. Some of the creditable activities involve educating and providing flood insurance data to the public, managing new development, establishing stricter floodplain requirements, acquiring homes in the floodplain, and maintaining existing levees.

Hazard Mitigation Grant Program. Federal funding under this program is available following a major disaster declaration requested by the Governor. The funding is allocated using a "sliding scale" formula based on the percentage of funds spent on Public and Individual Assistance for each Presidential declared disaster. These grant funds can be used to buy out low lying residents or make other improvements that will reduce the risk in the next flood. However, this funding is available only if the community, tribe, county and state have a series of nested all-hazard mitigation plans. State plans are revised and approved by FEMA every 3 years; county plans are re-done every 5 years.

Mitigation Planning. There may be opportunities to mitigate future damages from flooding. This could include managing floodplain development at the local level, obtaining grants to remove homes from the floodplain, or taking steps to qualify the community or tribe for reduced flood insurance rates. Your state or FEMA flood insurance points of contact are a good resource for these opportunities.

Risk Management Planning. FEMA also encourages communities and tribes to consider what could reasonably happen during a flood fight that could complicate

and hamper emergency activities. Some issues to consider include:

- Potential security issues such as terrorism, vandalism, looting, or other violent activities.
- Potential power outages.
- Coincident flood events such as small tributaries cresting at the same time as the main flooding source.
- Impacts of unexpected failures such as pumps, gates or other critical features.
- Higher than expected releases from an upstream dam that could impact flood volumes.
- Other unexpected perils such as hazardous debris or displaced farm animals or wildlife.



Photo: U.S. Army Corps of Engineers

Lessons Learned on Flood Fighting. The most important lessons learned are the ones you capture for your own community! Specifically those lessons learned from

previous flood flights or other emergency experiences. Although not all may be applicable to your situation, below are several lessons learned by a small community.

- Have a good hydraulic profile through your community.
- Have specific tasks identified to be completed at various flood stages.
- If you have a volunteer fire department, make arrangements for their labor to be paid.
- If the volunteer fire department is fully engaged in the flood fight, make arrangements for other fire departments to respond to fires.
- High School students make good sand baggers and you may want to request school be let out to assist.
- If there are too many sightseers, consider issuing no-travel alerts.
- A good source of clay for levees needs to be identified ahead of time.
- The National Guard can be a good source of support for traffic control and manning pumps.
- Good communications are needed between the City Emergency Management and the County and State.

- All storm water pipes discharging into the river need to have flap gates or other means of closure to prevent water from backing up into the community.
- Leaks and infiltration into the sanitary sewer system can overwhelm the lift stations and compromise the entire system.
- Ice jams under bridges can raise water levels significantly and it might be beneficial to pro-actively push the ice under to the bridge to keep it from jamming. Ice jams can also occur in river bends and at dams. It is important to document the history of ice jams in your area.
- The Emergency Manager should not be the Public Works Director as they are best dedicated to focusing on the utilities.



Photo: FEMA/Marilee Caliendo

Lessons Learned on Recovering from a Flood. You and community staff will be exhausted from the flood fight and may have even suffered personal losses and damages. Then the recovery will begin with political issues and a vast amount of paperwork and documentation. Learning about all the

processes and available options can be overwhelming. Often there will be difficult political decisions to be made regarding rebuilding. The best thing you can do is get as much help as possible, through mutual aid agreements with other local communities and tribes, from county, state, federal and volunteer agencies, and consultants.



Photo: U.S. Army Corps of Engineers

Below are some lessons learned from other communities:

- Establish points of contacts in state and federal agencies and a liaison to work with each.
- Document everything – too much information is never enough.
- Challenge/Encourage legislators (Federal and State) to figure out ways to streamline regulations such as bidding procedures and resources procurement.
- Utilize public forums and design charrettes for recovery changes.
- Leverage Federal resources with local ones for long-term investment.

- Condemning damaged homes can be a challenging process requiring a lot of communication and additional staffing.
- Getting power, water, and heat restored is critical to recovery.
- Require licensing of contractors and transient merchants, including bonding, criminal background checks, and photo I.D's. This will help safeguard people from "fly by night" operations.
- Pro-active steps need to be taken to make sure there is housing and day care for residents and housing for the influx of workers.
- Coordinate local, county and state hazard mitigation plans to ensure eligibility for Hazardous Mitigation Grant Program grants.
- Information on FEMA's Hazard Mitigation Grant Program.
<http://www.fema.gov/flood-mitigation-assistance-program>
- Additional information on the National Flood Insurance Program "FloodSmart"
<http://www.floodsmart.gov>.
- Minnesota Department of Commerce
<http://mn.gov/commerce/consumers/disaster-information-center/flood-insurance/>
- Answers to questions about the National Flood Insurance Program.
<http://www.fema.gov/media-library/assets/documents/272?id=1404>
- Iowa Lessons Learned
http://publications.iowa.gov/11080/1/2011-06_Iowa_Disaster_Recovery_Lessons_Learned_final.pdf
- Proactive Flood and Drought Management.
http://aquadoc.typepad.com/files/awra_report_proactive_flood_drought_final.pdf
- Hurricane Katrina case study
http://irgc.org/wp-content/uploads/2012/04/Hurricane_Katrina_full_case_study_web.pdf

List of Additional Resources:

- Since the 1997 flood and their successful recovery, the City of Grand Forks, ND has made many of their materials and processes available for other communities.
<http://www.grandforksgov.com/about-grand-forks/state-of-the-city/flood-recovery>
- Information on FEMA's National Flood Insurance Program
<http://www.fema.gov/national-flood-insurance-program>

- Lessons We Don't Learn
<http://faculty.nps.edu/dl/HFN/documents/DisasterLessons.pdf>

Forms:

- Lessons Learned

EVENT _____ LESSONS LEARNED
NAME: _____ DATE: _____
ROLE DURING EVENT: _____
ACTIVITY: _____
WHAT HAPPENED: _____ _____ _____
WHAT SHOULD HAVE HAPPENED: _____ _____ _____
ACTIONS/PROCESSES TO SUSTAIN: _____ _____ _____
RECOMMENDATIONS FOR IMPROVEMENT: _____ _____ _____
OTHER COMMENTS: _____ _____

- After Action

After Action Review Input Form	
Event: _____ After Action Review Input Form	
<i>(Personal Information is very helpful for follow-up but not required if anonymity is desired)</i>	
Name/POC: _____	Phone Number: _____
Organization: _____	E-mail: _____
<i>Check applicable boxes::</i>	
<input type="checkbox"/> Local Issue	<input type="checkbox"/> Other Federal Agency Issue
<input type="checkbox"/> State Issue	<input type="checkbox"/> Intergovernmental Issue
<input type="checkbox"/> FEMA Issue	
<input type="checkbox"/> Corps of Engineers Issue	
<i>Check applicable box:</i>	
<input type="checkbox"/> ISSUE (AREA TO IMPROVE): Enter a brief statement (1 or 2 sentences) to describe a problem. <i>OR</i>	
<input type="checkbox"/> SUCCESS (PRACTICE TO SUSTAIN): Enter a brief description of a solution for national or corporate consideration.	
Discussion: Provide background details regarding issue or success. Continue on page 2, if necessary.	
<i>Enter potential solution/suggested steps. Continue on page 2, if necessary.</i>	
Recommended Action(s):	
Obstacles to effecting Proposed Actions?	
Recommended Proponent (Office): Enter organization(s) you propose take action to resolve.	
1	

CHECKLIST
<u>Chapter 15 – Lessons</u>
<u>Learned</u>
<input type="checkbox"/> Educate community and tribe regarding flood insurance
<input type="checkbox"/> Grant application for mitigation funding.
<input type="checkbox"/> Capture lessons learned from past flood fights.

APPENDIX A
LINKS TO RESOURCES

Note: Sometimes links that don't readily open when clicked, will open when copy and pasted into your internet browser.

Chapter 1 - Introduction

- Midwest Assistance Program Preparation Guide for Small Communities: Main document:
<https://www.countyofdane.com/emergency/flood/pdfs/Local%20Response%20Plan.pdf>
- FEMA's "Developing and Maintaining Emergency Operations Plans"
<https://www.fema.gov/media-library/assets/documents/25975?id=5697>
- California "Sample Flood Safety Plan"
http://www.water.ca.gov/floodsafe/docs/SampleFloodSafetyPlan-DraftMarch_2011.pdf
- Flood Emergency Response Plan for Individual Business
http://www.lockton.com/Resource_/PageResource/MKT/FERP%20Flood%20Plan.pdf
- Flood Emergency Action Plans by FERC, Chapter 6
<https://www.ferc.gov/industries/hydropower/safety/guidelines/eng-guide/chap6.pdf>

Chapter 2 - Authority

- None

Chapter 3 – Mutual Aid Agreements

- NIMS Core Document: https://www.fema.gov/pdf/emergency/nims/NIMS_core.pdf
- Mutual Aid Lessons Learned from California <http://www.hsdl.org/?view&did=484122>
- EPA Mutual Aid Information
<http://water.epa.gov/infrastructure/watersecurity/mutualaid/index.cfm>
- ASTHO Emergency Authority and Immunity Toolkit
<http://www.astho.org/Programs/Preparedness/Public-Health-Emergency-Law/Emergency-Authority-and-Immunity-Toolkit/Mutual-Aid-and-Assistance-Agreements-Fact-Sheet/>

- King County Sample Mutual Aid Agreement
http://www.google.com/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=1&cad=rja&uact=8&sqi=2&ved=0CCYQFjAA&url=http%3A%2F%2Fkingcounty.gov%2F~%2Fmedia%2Fsafety%2Fprepare%2Fdocuments%2FEMProfessionals_Plans%2FDebrisMgmtPlan%2FAppendix_X_Sample_Mutual_Aid_Agreement_Template.ashx&ei=Htl8U8HTF8WkyASK8YG4Dg&usg=AFQjCNHp9AItV6TX72nTdMRujdL9LBam3A
- Link to EMAC, Emergency Management Assistance Compact:
<http://www.emacweb.org/?13>
- American Water Works Mutual Aid Agreements
<http://www.awwa.org/portals/0/files/resources/water%20knowledge/rc%20emergency%20prep/rc%20warn%20resources%20pdf/warnactionplan.pdf>

Chapter 4 - Personnel

- Case Study of Incident Command Systems
<http://cra20.humansci.msstate.edu/From%20Forest%20Fires%20to%20Katrina.pdf>
- FEMA’s “Protect Your Property from Flooding” <http://www.fema.gov/media-library/assets/documents/13261?id=3262>

Chapter 5 – Outside Contacts

- Corps of Engineers
<http://www.mvp.usace.army.mil/Missions/EmergencyManagement.aspx>
- USGS
<http://waterdata.usgs.gov/usa/nwis/rt>
- NWS <http://water.weather.gov/ahps/forecasts.php>.
- General <http://www.ready.gov/>
- FEMA <http://www.fema.gov/>

Chapter 6 – Flood Elevations, Mapping, and History

- Converting NGVD 1929 elevations to NAVD 1988: http://www.ngs.noaa.gov/cgi-bin/VERTCON/vert_con.prl
- FEMA Map Service Center:
<https://msc.fema.gov/webapp/wcs/stores/servlet/FemaWelcomeView?storeId=10001&catalogId=10001&langId=-1>
- The link to Minnesota topography can be found at:
<http://arcgis.dnr.state.mn.us/maps/mntopo/> for the tool and
<http://www.dnr.state.mn.us/maps/mntopo/index.html>.
- Orange County CA Flood fighting advice <http://ocflood.com/safety/fight/>

Chapter 7 – Tasks and Prioritized Actions

- Corps of Engineers St. Paul District Flood Manual
http://www.mvp.usace.army.mil/Portals/57/docs/Operations%20Center/CEMVP_Flood-Fight_Handbook_2009.pdf

Chapter 8 – Emergency Shelters

- Shelter Guidance and Shelter Staff Matrix <http://nationalmasscarestrategy.org/shelter/>
- Red Cross Shelters – Alameda County, CA
http://www.cdc.gov/nceh/ehs/Docs/Guide_for_Local_Jurisdictions_Care_and_Shelter_Planning.pdf
- Pet Evacuation Guidelines from FEMA <http://www.fema.gov/plan/prepare/animals.shtm>
- Livestock Evacuation Guidelines from the University of Vermont:
http://www.uvm.edu/~ascibios/?Page=Emergency/Disaster_Planning_for_Livestock.html&SM=submenuemergency.html
- Animal sheltering lessons learned
http://www.lsart.org/site/view/107339_EmergencyShelters.pml
- ASCE Article on lessons learned
[http://ascelibrary.org/doi/abs/10.1061/\(ASCE\)NH.1527-6996.0000055](http://ascelibrary.org/doi/abs/10.1061/(ASCE)NH.1527-6996.0000055)

Chapter 9 – Evacuation

- Vulnerable Residents Registration
<https://webapps.broward.org/VulnerableRegistry/Welcome.aspx>
- Ramsey County Registration <http://www.co.ramsey.mn.us/NR/rdonlyres/59835B15-BA12-4DC9-B66E-C1E24743ADC6/22483/ResidentailEmergencyInfoForm0211.pdf>
- City of Chicago Registration
<https://webapps1.cityofchicago.org/volunteerregistry/checkDisclaimer.do>
- Health Affairs Evacuation – the challenge of mandatory evacuations
<http://content.healthaffairs.org/content/25/4/958.full>
- California information on evacuations
http://www.google.com/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=1&ved=0CCYQFjAA&url=http%3A%2F%2Fwww.calema.ca.gov%2Fplanningandpreparedness%2Fdocuments%2Fevacuation.pdf&ei=cx88U-eREKLs2QXCl4GgCA&usg=AFQjCNEQmMAfdkNu_tVGXj0IwzPX6WI04w&bvm=bv.63934634,d.cWc
- National Weather Service Campaign “Turn Around, Don’t Drown”
<http://www.nws.noaa.gov/os/water/tadd>

Chapter 10 - Utilities

- None

Chapter 11 – Critical Facilities

- Emergency Power Facility Assessment Tool: <http://epfat.swf.usace.army.mil/>.
- State of Florida Standard Operating Procedures for Critical Facilities:
<http://www.training.fema.gov/EMIWeb/edu/docs/HistoricalInterest/Florida%20Division%20of%20EM%20-%20CFI-RSFI,%20Standard%20Operating%20Guidel.doc>.

Chapter 12 – Hazardous Materials

- EPA Underground Storage Tank Flood Guide
<http://www.epa.gov/oust/pubs/ustfloodguide.htm>

- Case Study
http://scholarcommons.usf.edu/cgi/viewcontent.cgi?article=1002&context=fmhi_pub
- Hazardous Material Guide for First Responders
https://www.hsdll.org/?view=docs/dod/10_01.pdf
- Example of a plan for a company
http://www.willis.com/documents/publications/Services/Claims_Management/TAB_Flood_Loss_0811.pdf

Chapter 13 - Communications

- Minnesota DLAN:
<http://www.mngeo.state.mn.us/councils/stategovt/DLANUserRegistrationAndBrief101909.pdf>
- North Dakota WebEOC: <http://www.nd.gov/des/planning/webeoc-training/>
- Social Media and Hurricane Sandy: Lessons Learned
https://communities.firstresponder.gov/DHS_VSMWG_Lessons_Learned_Social_Media_and_Hurricane_Sandy_Formatted_June_2013_FINAL.pdf
- Evaluating amateur radio operators <http://www.usfa.fema.gov/pdf/efop/efo37991.pdf>
- Sample communications plan: http://www.nvcc.edu/about-nova/emergency/CrisisCommunicationProtocols_11_03_14-Final.pdf

Chapter 14 – Training and Exercises

- FEMA training is available at <https://training.fema.gov/IS/>
- National Response Framework <http://www.fema.gov/national-response-framework>
- FEMA Table Top Exercise
<http://usasearch.fema.gov/search?query=unit+5+tabletop+exercise&op=Search&affiliate=fema>
- Guide to a Successful Table Top Exercise <http://www.preparis.com/blog/guide-to-successful-tabletop-exercises/>

- Training available through the Emergency Management Assistance Compact (EMAC)
<http://www.emacweb.org/index.php/trainingeducation>

Chapter 15 – Mitigation, Floodplain Management and Insurance: Lessons Learned

- Since the 1997 flood and their successful recovery, the City of Grand Forks, ND has made many of their materials and processes available for other communities.
<http://www.grandforksgov.com/about-grand-forks/state-of-the-city/flood-recovery>
- Information on FEMA’s National Flood Insurance Program
<http://www.fema.gov/national-flood-insurance-program>
- Information on FEMA’s Hazard Mitigation Grant Program. <http://www.fema.gov/flood-mitigation-assistance-program>
- Additional information on the National Flood Insurance Program “FloodSmart”
<http://www.floodsmart.gov>.
- Minnesota Department of Commerce <http://mn.gov/commerce/consumers/disaster-information-center/flood-insurance/>
- Answers to questions about the National Flood Insurance Program.
<http://www.fema.gov/media-library/assets/documents/272?id=1404>
- Iowa Lessons Learned http://publications.iowa.gov/11080/1/2011-06_Iowa_Disaster_Recovery_Lessons_Learned_final.pdf
- Proactive Flood and Drought Management.
http://aquadoc.typepad.com/files/awra_report_proactive_flood_drought_final.pdf
- Hurricane Katrina case study http://irgc.org/wp-content/uploads/2012/04/Hurricane_Katrina_full_case_study_web.pdf
- Lessons We Don’t Learn <http://faculty.nps.edu/dl/HFN/documents/DisasterLessons.pdf>

APPENDIX B
FORMS AND SAMPLES

RECORD OF PLAN DISTRIBUTION

Date of Last Distributed Update: _____

Distributed to:

1. *Agency, Name, Address or Email (if done electronically)*

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

9. _____

10. _____

11. _____

12. _____

SUBJECT: _____

Date: _____

LOCATION: _____

MEETING ATTENDANCE RECORD

Please Sign In: (print clearly)			
	Name	Representing	Phone # (optional)
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**SAMPLE RESOLUTION FOR AUTHORITY TO BEGIN
EMERGENCY ACTION PLAN**

(Name of Board or Council)

(Name of government unit, e.g., City of _____, _____ Tribe)

Resolution # _____

WHEREAS, the _____ wishes to prepare a Flood Emergency Action Plan to better prepare for the next flood fight; and

WHEREAS, the plan will require the efforts of a committee and public review;

NOW, THEREFORE, BE IT RESOLVED THAT _____ grants authorization for the Committee to prepare a draft plan for the review by the public and this Council;

BE IT FURTHER RESOLVED that the Committee will be chaired by _____ and the members of the Committee will be selected by the Chairperson.

APPROVED AND ADOPTED by the (Council or Board) on this date _____.

AYES: _____

NAYES: _____

ABSENT: _____

(Chairperson or Mayor)

ATTEST:

Clerk/Secretary _____

**SAMPLE RESOLUTION FOR AUTHORITY TO APPROVE
EMERGENCY ACTION PLAN**

(Name of Board or Council)

(Name of government unit, e.g., City of _____, _____ Tribe)

Resolution # _____

WHEREAS, the _____ approved the formation of a Committee to prepare a Flood Emergency Action Plan to better prepare for the next flood fight; and

WHEREAS, the plan has been prepared and undergone public review; and

WHEREAS, the _____ has reviewed the final document;

NOW, THEREFORE, BE IT RESOLVED THAT _____ approves the Flood Emergency Action Plan dated _____.

BE IT FURTHER RESOLVED that the _____ recommends that the Plan to updated annually and brought back for (Council or Board) review.

BE IT FURTHER RESOLVED that the _____ supports annual training as needed to maintain a ready flood fight team.

APPROVED AND ADOPTED by the (Council or Board) on this date _____.

AYES: _____

NAYES: _____

ABSENT: _____

(Chairperson or Mayor)

ATTEST:

Clerk/Secretary _____

SAMPLE: This resolution can be used or modified, as necessary, to fulfill the federal requirement for an “executive order, proclamation, resolution, or legislation” indicating a government has adopted the National Incident Management System (NIMS).

(Name of Board or Council)

(Name of government unit, e.g., City of ____, County of ____, ____, Tribe)

Resolution #

WHEREAS, the President in Homeland Security Directive-5, directed the Secretary of the Department of Homeland Security to develop and administer a National Incident Management System, which would provide a consistent nationwide approach for federal, state, local, and tribal governments to work together more effectively and efficiently to prevent, prepare for, respond to, and recover from disasters, regardless of cause, size, or complexity; and

WHEREAS; California pioneered the development of standardized incident management systems to respond to a variety of catastrophic disasters, including fires, earthquakes, floods, and landslide; and

WHEREAS, in the early 1970s, the California fire service, in partnership with the federal government, developed the seminal emergency incident command system that has become the model for incident management nationwide; and

WHEREAS; in 1993, California was the first state to adopt a statewide Standardized Emergency Management System for use by every emergency response organization, and implemented a system to ensure the continual improvement of the Standardized Emergency Management System; and

WHEREAS, California emergency management professionals have contributed their expertise to the development of the new National Incident Management System; and

WHEREAS, it is essential for responding to disasters that federal, state, local, and tribal organizations utilize standardized terminology, standardized organizational structures, interoperable communications, consolidated action plans, unified command structures, uniform personnel qualification standards, uniform standards for planning, training, and exercising, comprehensive resource management, and designated incident facilities during emergencies or disasters; and

WHEREAS, the California Standardized Emergency Management System substantially meets the objectives of the National Incident Management System,

WHEREAS, the National Commission on Terrorist Attacks (9-11 Commission) recommended adoption of a standardized Incident Command System nationwide, and

WHEREAS, the Governor of the State of California has directed his Office of Emergency Services and Office of Homeland Security in cooperation with the Standardized Emergency Management System Advisory Board to develop a program to integrate the National Incident Management System, to the extent appropriate, into the state's emergency management system;

NOW, THEREFORE, BE IT RESOLVED that (Name of government unit, e.g., City of , County of , ___ Tribe), will integrate the National Incident Management System, to the extent appropriate, into the emergency management system; and

BE IT FURTHER RESOLVED that the (Name of government unit, e.g., City of ___ , County of ___ , ___ Tribe) utilizes the National Incident Management System which shall be consistent with the integration of the National Incident Management System and the Standardized Emergency Management System in California; and

BE IT FURTHER RESOLVED that a copy of this resolution is forwarded to the Governor's Office of Emergency Services.

APPROVED AND ADOPTED by the (Council or Board) on ____ __, 2005.

AYES: _____

NAYES: _____

ABSENT: _____

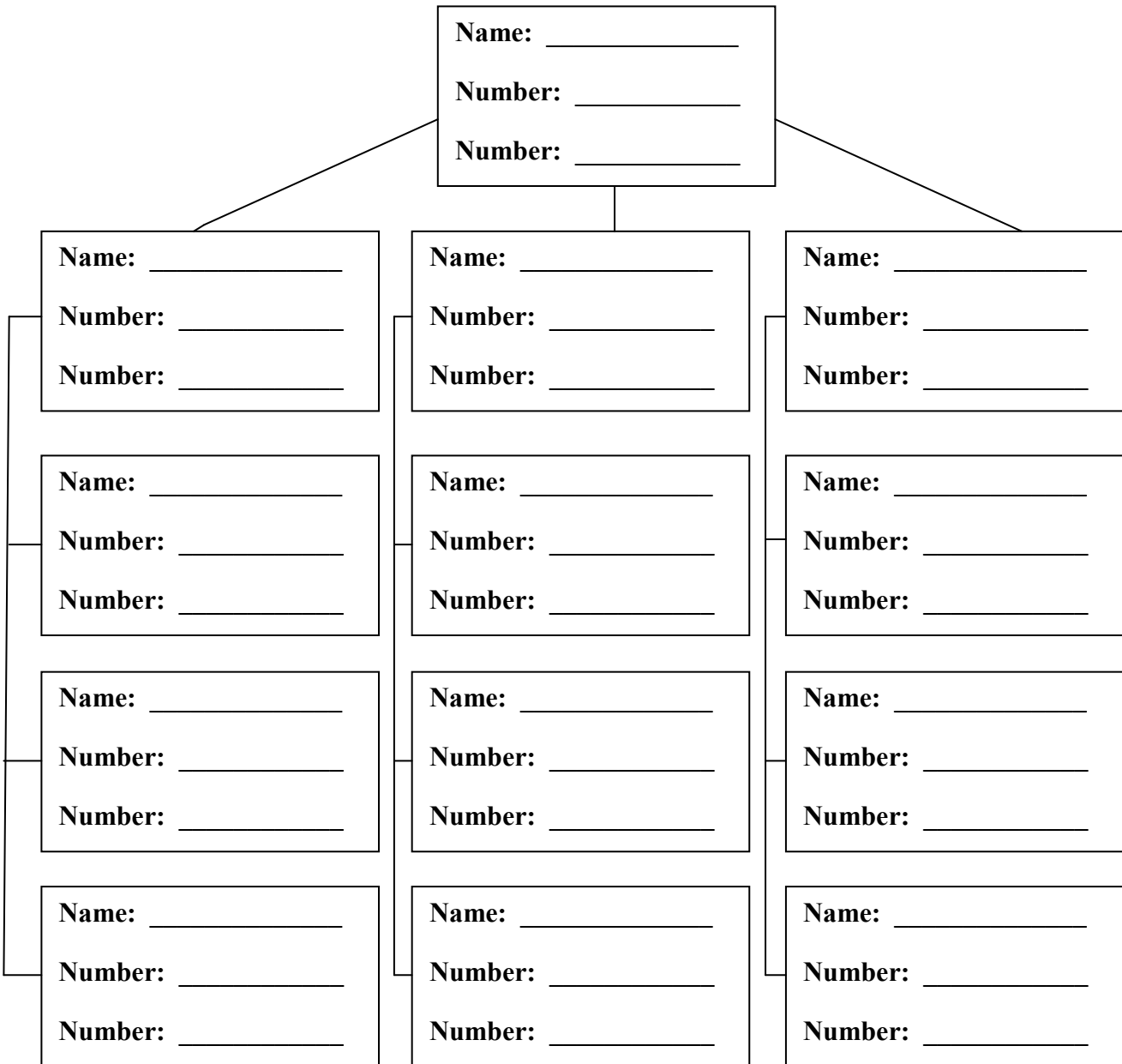
(Chairperson or Mayor)

ATTEST:

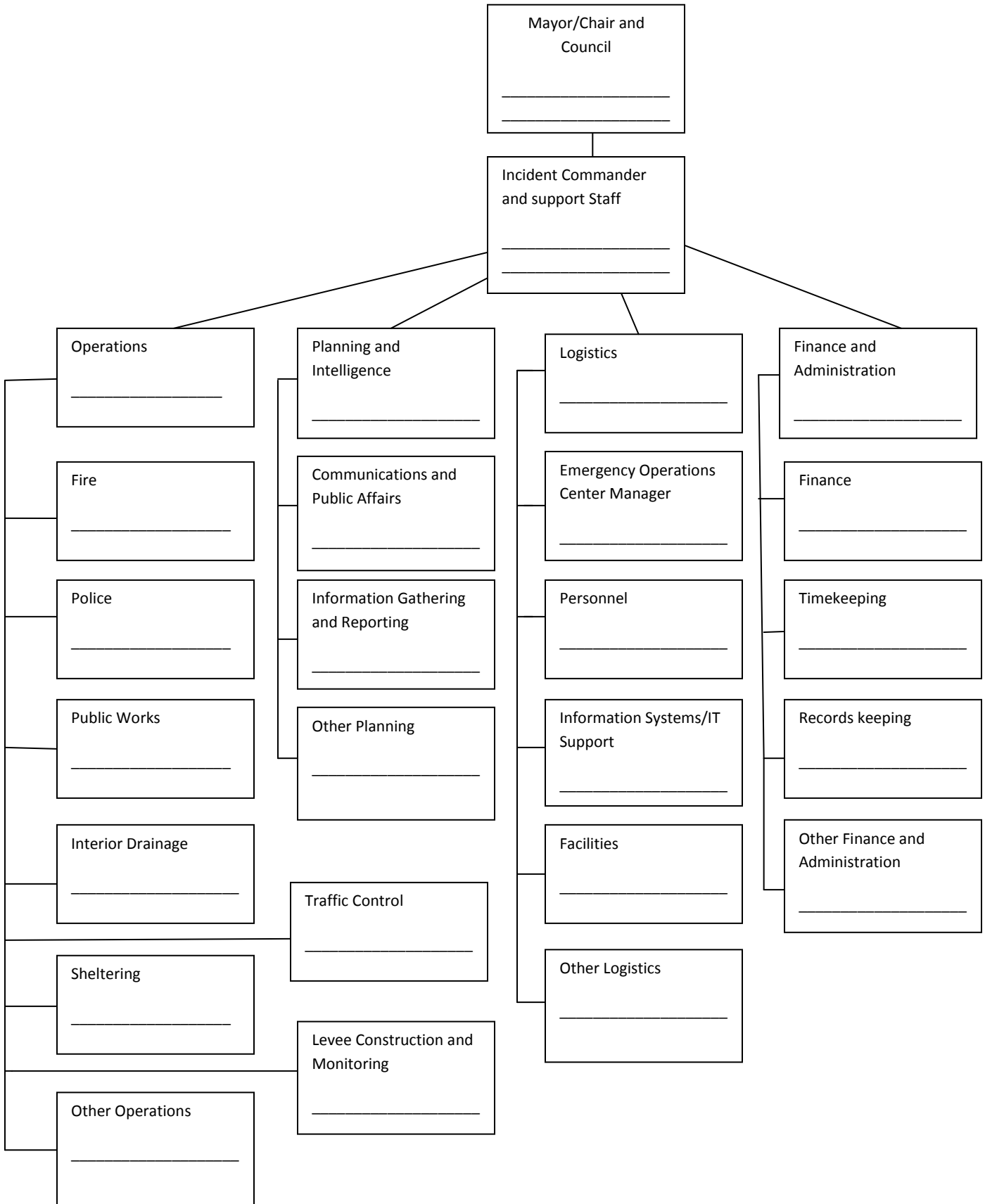
Clerk/Secretary _____

Date: _____

CALL TREE FOR



ORGANIZATIONAL CHART



OUTSIDE CONTACTS

Organization	Name	Phone	Alternate Phone	Email or Website
Key Websites				
National Weather Service				
USGS Gages				
<i>Other</i>				
Utilities				
<i>Water</i>				
<i>Sewer</i>				
<i>Gas</i>				
<i>Electric</i>				
<i>Telephone</i>				
<i>Cable/Communications</i>				
<i>Other</i>				
Mutual Aid Contacts				
County				
County Emergency Management				
County Sheriff				
<i>Other</i>				

TASK WORKSHEET

TASK NO. _____

TASK TITLE: _____

River Stage	
Task Description	
Cautions:	

Detailed Task Description:

Equipment and Personnel Needed:

Photos:

TASK WORKSHEET

TASK NO. _____

TASK TITLE: _____

River Stage	
Task Description	
Cautions:	

Detailed Task Description:

Equipment and Personnel Needed:

Photos:

Site Name: _____

Date: _____

EVALUATION OF SHELTERS

It is intended that this form be completed to the maximum extent possible for each shelter evaluated. Then all evaluations should be reviewed by the committee, shelters selected, and arrangements made to utilize the location if ever needed.

Name of Location:	
Address of Location:	
Date Evaluated:	
Team Evaluating:	
Point of Contact for Site: (Name, Position, Phone)	

EVALUATION FACTORS

Short-Term, Long-Term, or for Pets?	
Estimated People That Could Be Accommodated? (20-40 sft per person)	
Is Facility Behind Levee? Elevation of Facility:	
Handicap Accessible?	
Number of Toilets? (minimum 1 toilet per 40 people)	
Number of Showers?	
Kitchen Available?	
Is Back-up Generator Available?	
Would Location be Susceptible to Water or Sewer Back-up?	

Comments and Recommendations:

Last Updated: _____

SPECIAL NEEDS REGISTRY

Name:	Address:	Phone Number:	Alternate Contact (Name and Phone):	Special Needs (<i>Mobility, Language barriers, Hearing or Sight Limitations, Oxygen use, etc.</i>)

SPECIAL NEEDS REGISTRY DURING TIMES OF EVACUATION

PARTICIPANT WAIVER SHEET

By signing below, I request that my name be added to the _____ Special Needs Registry.

I understand that although efforts will be made to assist me should an evacuation be necessary, this does not guarantee that resources will be available or that I will be given priority in evacuating. I understand I should make my own arrangements and have a plan in place should an evacuation be ordered due to flooding or other disasters.

I am providing this information voluntarily and will contact the _____ Department at _____ should my information change.

The _____ has my permission to contact my designated alternate if they are unable to reach me in a timely manner.

SIGNED: _____

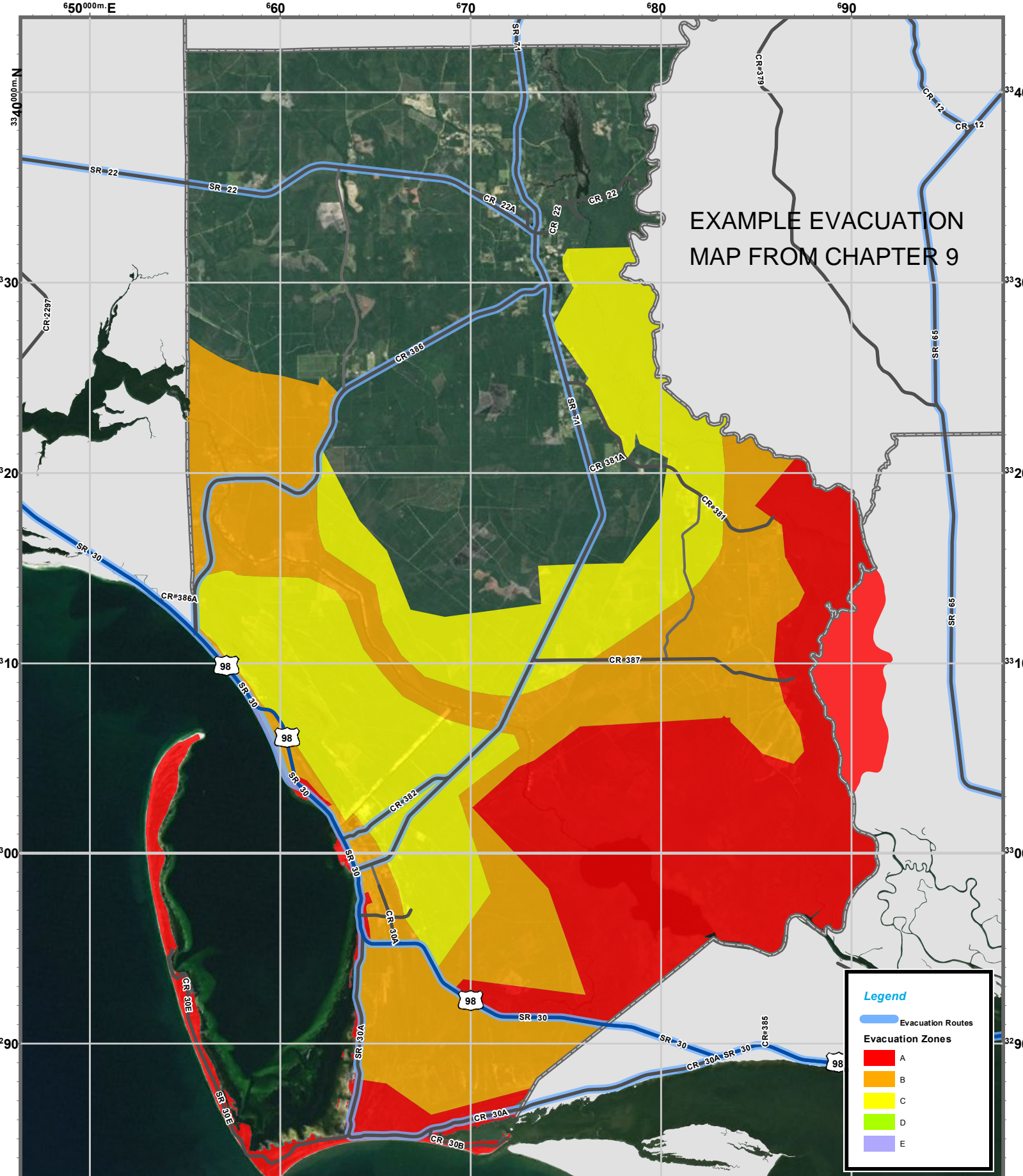
Name (Printed): _____

Date: _____

Designated Alternate:

Name: _____

Phone Numbers: _____



EXAMPLE EVACUATION
MAP FROM CHAPTER 9

Legend

- Evacuation Routes

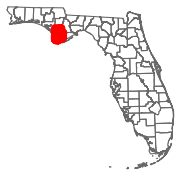
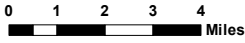
Evacuation Zones

- A
- B
- C
- D
- E

Disclaimer: Map is intended for reference only
No warranty for accuracy provided

Created By: GIS Section
Requested By: Standard Map Product
Date: 4/29/2014
Time: 12:20:32 PM
Path: S:\Projects\EvacRoute_SurgoZone_Maps\2014_Maps\MXD\EvacRoutes_Zones\UTM16_Portrait.mxd

GULF
EVACUATION ROUTES & ZONES



Last Updated: _____

CRITICAL FACILITIES

Facility			Point of Contact			
Name of Facility	Address	Elevation	Name	Phone	Alternate Phone	Email

SAMPLE PRESS RELEASES

Draft Public Announcement Message 1

The National Weather Service has issued a flood warning that includes the community/tribe of _____. This means that high water along the _____ river and the levee is very likely. Residents in low lying areas should review their personal evacuation plans remain vigilant to updates. The _____ will provide updates to the radio and television stations as well as on facebook and at the _____ website at _____.

Draft Public Announcement Message 2

The National Weather Service forecast for the _____ river indicates the overtopping of the levees is a possibility. Raising the levees is ongoing around the clock. However, residents, particularly in low lying area, are encouraged to consider voluntarily evacuating to higher ground. The _____ will provide updates to the radio and television stations as well as on facebook and at the _____ website at _____.

Draft Public Announcement Message 3

The levees are in eminent danger of failure. The area of _____ or evacuation zones _____ are under a mandatory evacuation order. All residents in these areas are directed to move to higher ground immediately. The _____ will provide updates to the radio and television stations as well as on facebook and at the _____ website at _____.

After Action Review Input Form

Event: _____
After Action Review Input Form

(Personal Information is very helpful for follow-up but not required if anonymity is desired)

Name/POC:	Phone Number:
Organization:	E-mail:

Check applicable box(es)::

<input type="checkbox"/>	Local Issue	<input type="checkbox"/>	Other Federal Agency Issue
<input type="checkbox"/>	State Issue	<input type="checkbox"/>	Intergovernmental Issue
<input type="checkbox"/>	FEMA Issue	<input type="checkbox"/>	
<input type="checkbox"/>	Corps of Engineers Issue	<input type="checkbox"/>	

Check applicable box:

- ISSUE (AREA TO IMPROVE):** *Enter a brief statement (1 or 2 sentences) to describe a problem.*
OR
- SUCCESS (PRACTICE TO SUSTAIN):** *Enter a brief description of a solution for national or corporate consideration.*

Discussion: *Provide background details regarding issue or success. Continue on page 2, if necessary.*

Enter potential solution/suggested steps. Continue on page 2, if necessary.

Recommended Action(s):

Obstacles to effecting Proposed Actions?

Recommended Proponent (Office): *Enter organization(s) you propose take action to resolve.*

EVENT _____
LESSONS LEARNED

NAME: _____ **DATE:** _____

ROLE DURING EVENT: _____

ACTIVITY: _____

WHAT HAPPENED: _____

WHAT SHOULD HAVE HAPPENED: _____

ACTIONS/PROCESSES TO SUSTAIN: _____

RECOMMENDATIONS FOR IMPROVEMENT: _____

OTHER COMMENTS: _____

APPENDIX C
EXAMPLE
FLOOD EMERGENCY ACTION PLAN

EXAMPLE
FLOOD EMERGENCY ACTION PLAN
FOR THE COMMUNITY/TRIBE OF

Prepared by: _____

Date: _____

RECORD OF PLAN DISTRIBUTION

Date of Last Distributed Update: _____

Distributed to:

1. *Agency, Name, Address or Email (if done electronically)*

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

9. _____

10. _____

11. _____

12. _____

RECORD OF PLAN UPDATES

This flood emergency action plan will be reviewed for changes after the spring flood season of each year, contact information will be updated, and the revisions approved by Council each January.

Version #	Description of Change	Date	Issued By:
<i>Draft</i>	<i>Initial distributed for comment before finalizing</i>	<i>06/12/14</i>	<i>J. Doe</i>

TABLE OF CONTENTS

- 1. Purpose**
 - a. Overall Project Map**
- 2. Authority**
- 3. Mutual Aid Agreements**
- 4. Personnel for Flood Organization**
 - a. Organizational Chart**
- 5. Outside Contacts**
- 6. Flood Elevations and History**
 - a. Floodplain Map**
 - b. Inundation Map**
 - c. Map of Levee System**
 - d. Hydraulic Profile**
- 7. Tasks and Prioritized Actions**
 - a. Task List**
 - b. Task Worksheets**
- 8. Emergency Shelters**
 - a. Summary of Shelters**
 - b. Evaluation of Shelters**
- 9. Evacuation**
 - a. Map of Evacuation Zones and Routes**
- 10. Utilities**
- 11. Critical Facilities**
- 12. Hazardous Materials**
- 13. Communications**
- 14. Training**
- 15. Lessons Learned**

APPENDICES

- A. Sample Resolution**
- B. Mutual Aid Agreements**
- C. Sample Press Releases**

CHAPTER 1

PURPOSE

1. Statement of Purpose.

The purpose of this plan is to describe the procedures to be used in the event of a flood. This includes a description of the flood personnel organization, available resources such as mutual aid agreements, and specific tasks to be accomplished with the rising river levels.

2. Gage Information and Elevation Data

Location of gage. General description of how river stages of gages relate to elevations in the community.

3. General Map

Overall aerial map showing existing levees, pump stations, road closures, or proposed temporary levees.

MAP

CHAPTER 2

AUTHORITY

1. Authority

The City Council has the authority to declare an emergency. City staff will prepare the appropriate resolution and notify officials if a special council meeting is recommended.

2. Process for Declaring an Emergency.

Staff will monitor National Weather Service flood forecasts and notify the Council and flood personnel as appropriate.

3. Sample Resolution.

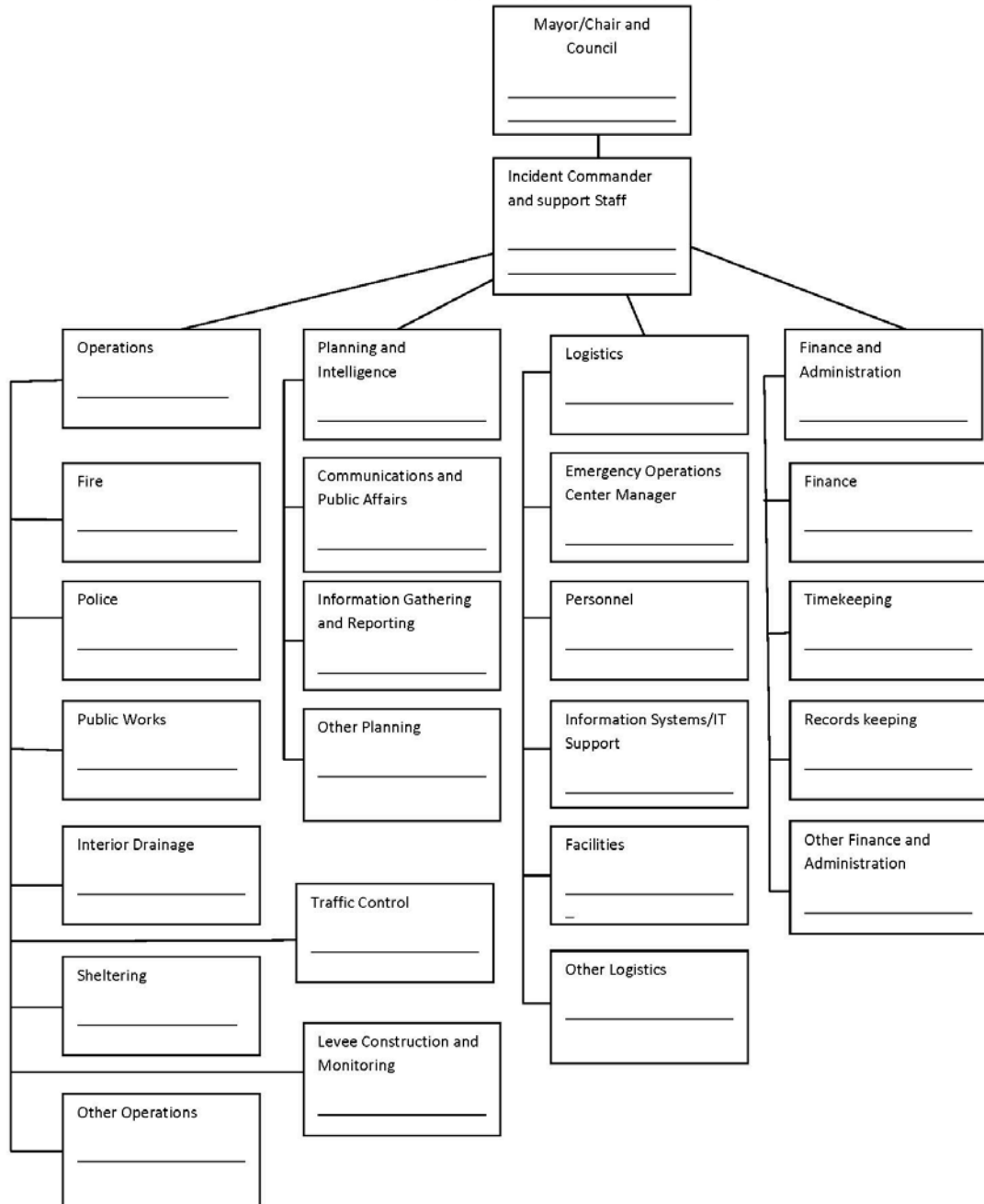
A sample resolution is included as part of the appendix.

CHAPTER 3 MUTUAL AID AGREEMENTS

The following mutual aid agreements are in place and available for back-up if needed during the flood fight. Copies of the agreements are included in the appendix.

Community	Purpose	Point of Contact	Phone and Email
<i>Oak Park</i>	<i>Staff for second shift for emergency operations center</i>	<i>John Doe</i>	<i>651-555-1212 J.Doe.OakPark@gmail.com</i>

ORGANIZATIONAL CHART



**CHAPTER 5
OUTSIDE CONTACTS**

Organization	Name	Phone	Alternate Phone	Email or Website
Key Websites				
National Weather Service				
USGS Gages				
<i>Other</i>				
Utilities				
<i>Water</i>				
Sewer				
<i>Gas</i>				
<i>Electric</i>				
<i>Telephone</i>				
<i>Cable/Communications</i>				
<i>Other</i>				
Mutual Aid Contacts				
County				
County Emergency Management				
County Sheriff				
<i>Other</i>				

CHAPTER 6 FLOOD ELEVATIONS AND HISTORY

- *The nearest river gage is _____.*
- *The difference between the river stage and the elevations in our community is _____, that is, when the river stage is at ____feet, that is equivalent to an elevation of _____ at _____.*
- *The elevation datum for surveys in our area is _____. This is <the same> <or different by ____feet> from the datum of the river gage.*
- *The following items should be noted for future flood fights:*

- *Attached are the following maps and graphs:*
 - *Floodplain map <possibly from flood insurance study>*
 - *Inundation map, both with and without permanent or temporary levees*
 - *Map of permanent or temporary levee system*
 - *Hydraulic profile*

FLOODPLAIN MAP

INUNDATION MAP

MAP OF LEVEE SYSTEM

HYDRAULIC PROFILE

TASK WORKSHEET

TASK NO. 001

TASK TITLE: *Close Gates to River*

River Stage	5
Task Description	<i>Close gates on stormwater discharges into river (3 locations).</i>
Cautions:	<i>Allow ½ day since may be iced in and need to be steamed out.</i>

Detailed Task Description:

There are 3 gates that need to be securely closed before the river stage comes up. They are often iced in or may have debris blocking them from completely closing. The 3 gates are located as follows:

- 1) Approximately 15 feet down the riverbank, near the intersection of 4th and Elm.*
- 2) Behind the Quick Fix Shop on Forest. May need to ask the Quick Fix (Steve 724-8853) to move parked vehicles.*
- 3) Near the Main Street Bridge on the East side. May need to plow approach to reach.*

Equipment and Personnel Needed:

Two people, one-half day, pick-up with plow, portable steamer, hand tools.

Photos:

TASK WORKSHEET

TASK NO. _____

TASK TITLE: _____

River Stage	
Task Description	
Cautions:	

Detailed Task Description:

Equipment and Personnel Needed:

Photos:

CHAPTER 8

Last Updated: _____

SUMMARY OF SHELTERS

The following locations are identified for shelters: short term, long term, and for pets.

Location	Elevation	Point of Contact	Phone numbers	Email
Short - Term				
<i>Lutheran Church</i>	<i>1460</i>	<i>Rev. John Doe</i>	<i>721-444-1212</i>	<i>John.doe@first Lutheran.com</i>
<i>Other</i>				
Long-Term				
Pets				

Site Name: _____

Date:-----

EVALUATION OF SHELTERS

It is intended that this form be completed to the maximum extent possible for each shelter evaluated. Then all evaluations should be reviewed by the group, the most favorable sites selected, and arrangements made to utilize the location if ever needed. Note that the evaluation factors are more for comparison purposes. It is very likely that few available sites will meet all of the evaluation factors.

Name of Location:	
Address of Location:	
Date Evaluated:	
Team Evaluating:	
Point of Contact for Site: (Name, Position, Phone)	

EVALUATION FACTORS

Short-Term, Long-Term, or for Pets?	
Estimated People That Could Be Accommodated? (20-40 sft per person)	
Is Facility Behind Levee? Elevation of Facility:	
Handicap Accessible?	
Number of Toilets? (minimum 1 toilet per 40 people)	
Number of Showers?	
Kitchen Available?	
Is Back-up Generator Available?	
Would Location be Susceptible to Water or Sewer Back-up?	

Comments and Recommendations:

CHAPTER 9 EVACUATION

If flooding should require an evacuation, the information would be conveyed to the public as described in the chapter on communications. Depending on the extent of the flooding, the evacuation may be designated by zones, as shown on the attached map.

The evacuation routes are as follows:

- *First*
- *Second*

The areas to avoid are:

- *Low bridge*
- *Location of flooded roads*
- *Flooded underpass*

Individuals that are included on the Special Needs Registry, maintained by the Fire Department, will be contacted individually to assure their evacuation.

MAP OF EVACUATION ZONES AND ROUTES

CHAPTER 10

UTILITIES

Contacts for all utilities are included in Chapter 5. This Chapter can be used for any additional notes on issues with utilities that should be noted.

CHAPTER 12

Last Updated: _____

HAZARDOUS MATERIAL LOCATIONS

Name of Facility	Type of Materials	Address	Elevation	Point of Contact			
				Name	Phone	Alternate Phone	Email

Additional Notes:

CHAPTER 13 COMMUNICATIONS

1. *The objective is to provide concise information to the public in a timely manner through multiple media.*
2. *The designated spokesperson is _____ . All press releases or information posted to the internet should be coordinated through the designated spokesperson.*
3. *The email, phone number, and fax numbers for the local radio and television stations are listed below*
 - *First*
 - *Second*
 - *Third*
4. *Discuss the Reverse 911 system if available.*
5. *Discuss the use of social media such as website, facebook, twitter, if will be used.*
6. *Discuss the interoperability of the radio system between local departments and with state and federal agencies.*
7. *Discuss whether Incident Management Software will be used and who will be the point of contact.*
8. *Discuss any known ham operators that have been contacted about assisting during an emergency.*
9. *Discuss the availability of tools at the EOC such as conference lines and speaker phones. For instance, are they borrowed from another department?*

CHAPTER 14

TRAINING

To assure the readiness of the flood team, the following training is recommended to be completed by key personnel, including:

- *Mayor or Chairperson*
- *Council Members*
- *Incident Commander*
- *Chiefs of Operations, Planning, Logistics, and Financial*
- *Police Chief*
- *Fire Chief*
- *Public Works Director*

Most of the training is available on-line or through the state. Additional opportunities for training should be pursued as budgets allow.

The following classes are recommended for most of the flood team:

- *National Incident Management System*
- *Incident Command Systems*
- *Flood fighting training offered through the State EOC or equivalent class*
- *List others as appropriate*

The following classes are recommended for at least one representative of the flood team:

- *National Flood Insurance Program*
- *Social Media in Emergency Management*
- *Mitigation Planning for Local and Tribal Communities*
- *Introduction to Hazard Mitigation*
- *Emergency Management for Senior Officials*
- *List others as appropriate*

As part of ongoing readiness, the team will annually conduct a table top exercise in March. Describe any logistical details that are required to allow this to happen.

CHAPTER 15 LESSONS LEARNED

It will be the practice of this community or tribe to have a meeting after every flood fight to capture what worked and what didn't work and update this plan accordingly. A summary of lessons learned to date are captured below:

2014 Flood:

- *A*
- *B*
- *C*
- *D*

APPENDIX

- 1. Sample resolution**
- 2. Mutual aid agreements**
- 3. Sample press releases**

APPENDIX D
GLOSSARY AND ACRONYMS

EMERGENCY ACTION PLAN

APPENDIX D

GLOSSARY AND ACRONYMS

Glossary

1. **Call Tree.** A means by which a large group of people can be contacted in a short time. The plan is designated ahead of time and each person calls a small number of people who in turn each call a small number of people until everyone is contacted.
2. **Critical Facilities.** Locations that provide essential services and functions such as hospitals, nursing homes, fire stations, water and sewer treatment plants.
3. **DLan.** The on-line system the State of Minnesota uses to process and track requests for assistance during an emergency response.
4. **Elevation Datum.** The basis for surveyed information. Elevations are based on benchmarks that were established at different times over the years and can vary slightly. Comparing river stages in one datum with surveyed ground elevations in another datum can result in critical discrepancies.
5. **Emergency Action Plan.** A step by step plan that addresses how a community or tribe will response to all aspects of an emergency, in this case a flood.
6. **Emergency Declaration.** The action a political body such as a council, state, or nation, takes in the event of an emergency in order to be eligible for assistance from emergency programs.
7. **Evacuation Zones.** Designated divisions of a community based on elevations, risk of flooding, and evacuation routes, so that an evacuation can be more specifically directed.
8. **Flood or River Gages.** Gages that provide data on the water levels in the river. These are usually operated by the National Weather Service or the United States Geological Survey agencies and the information is available on the internet. Some may be located on remote bridges and need to be manually read.

9. **Floodplain Mapping.** A program available through FEMA that identifies areas of flood risk in a community. The mapping is associated with an insurance program and local zoning ordinances.
10. **Hazard Mitigation Grant Program (HMGP).** A FEMA program by which funds are made available to the State as a Grantee to reduce future flood risks such as removing homes from the floodplain, and other risk reduction and mitigation measures.
11. **Hazardous Materials.** Any materials that corrode other materials, explode or are easily ignited, react strongly with water, are unstable when exposed to heat or shock, or are toxic to humans, animals, or the environment.
12. **Hydraulic Profile.** The slope of the water in the river. The profile can be impacted by the grade of the river channel as it flows downstream but also by water backing up behind bridges.
13. **Incident Command System.** A system created to better manage an emergency response across multiple jurisdictional boundaries. Some features include common terminology, integrated communications, and unified command.
14. **Inundation Maps.** Maps that identify the areas that would be flooded for a particular size flood event. Different maps for different levels of flooding are useful, but the one percent flood is the most common event used in FEMA floodplain mapping.
15. **Mitigation Planning.** Identifies policies and actions that can be implemented over the long term to reduce risk and future losses from hazards. These mitigation policies and actions are identified based on an assessment of hazards, vulnerabilities, and risks. The public and a wide range of stakeholders should be involved in the planning process.
16. **Mutual Aid Agreements.** Agreements between communities, tribes, or agencies to share labor, equipment, and resources during an emergency. Fire departments assisting each other are a well known example.
17. **National Flood Insurance Program.** A federal program created by Congress and managed by FEMA. The purpose is to mitigate future flood losses nationwide through sound, community-enforced building and zoning ordinances and to provide access to affordable, federally backed flood insurance protection for property owners.
18. **National Flood Insurance Community Rating System.** A system within the FEMA flood insurance program that recognizes community efforts beyond those minimum standards and reduces flood insurance premiums for the community's property owners.
19. **National Incident Management System.** A system developed to provide uniformity and consistency across all levels of government during a response.

20. **One-Hundred Year Flood.** A term frequently used to describe a flood event that has a one percent chance of occurring in any given year. The term implies that it is a once in a lifetime event, which is not an accurate representation of the probability.
21. **Reverse 911.** A communications system that allows for pre-recorded messages to be sent to all phones in a specified geographic area.
22. **Special Needs Registry.** A means for identifying elderly or vulnerable persons that may need additional assistance during an evacuation.
23. **Storm Water Plugs.** Devices that are placed in storm water pipes in manholes to prevent floodwaters from the river from backing up into the community.
24. **Tabletop Exercise.** A process by which various scenarios are presented for discussion and the group of flood personnel talk through the steps and possible challenges.
25. **Topographical Mapping or Topo.** Mapping that shows elevations and contours of an area.
26. **Web EOC.** An on-line system used by FEMA and a number of states for tracking requests for resources and the status of flood responses in real time.

Acronyms

1. DHS S&T Department of Homeland Security Science and Technology Directorate
2. DLAN Disaster Local Area Network
3. EMAC Emergency Management Assistance Compact
4. EOC Emergency Operations Center
5. FEMA Federal Emergency Management Agency
6. GIS Geographic Information Systems
7. HUD Housing and Urban Development (Federal Agency)
8. ICS Incident Command Systems
9. NAVD88 North American Vertical Datum of 1988
10. NGVD29 National Geodetic Vertical Datum of 1929
11. NIMS National Incident Management System
12. NRCS Natural Resources Conservation Service
13. NWS National Weather Service
14. RACE Radio Amateur Civil Emergency Services
15. USGS United States Geological Survey
16. VSMWG Virtual Social Media Working Group