INCIDENT ANNEX A

SEVERE WEATHER EMERGENCY

Primary Agency: Division of Emergency Management
Support Agency: Planning Department
Emergency Support Functions: Communications and Warning, Emergency Public Information, Law Enforcement, Mass Care, Resources

I. PURPOSE

The purpose of the Severe Weather Emergency Incident Annex is to provide for an effective and coordinated response by the City of Newport News and supporting organizations in the event of a severe weather emergency occurring within the City of Newport News. The City's Severe Weather Response Plan supplements this annex by monitoring severe weather, and providing an effective and coordinated response to severe storm activity. As part of the Emergency Operations Plan (EOP), this incident annex will initiate a City-wide response to the potential threat and damage from most severe weather including flooding, hurricanes, storms, high winds, tornados, winter weather, and extreme heat.

II. SCOPE AND APPLICABILITY

The City of Newport News is one of 18 coastal localities in Virginia for which the hurricane and severe storm threat is a major hazard, and for which a Severe Weather Response Plan to the Emergency Operation Plan (EOP) is available. Recent evacuation studies have revealed that over 34,000 residents in Newport News residing in recognized storm inundation zones may be advised to evacuate their homes if a severe storm threatens the area. Although federal and state agencies will have resources to provide massive aid under catastrophic conditions, the City must be prepared to operate without assistance for at least 3-5 days after the catastrophe.

III. ORGANIZATION

The Division of Emergency Management will be responsible for monitoring weather conditions on a daily basis for potential or actual threats to the City or region. The Division of Emergency Management will coordinate closely with the National Weather Service in Wakefield, VA.

The Division of Emergency Management will also maintain a storm assessment capability based on "Decision Arc" methodology. This methodology will utilize the storm tracking computer program *HURREVAC 2010*. This procedure is further described in the City's Severe Weather Plan

The City of Newport News Emergency Operations Center will consist of existing government departments and supporting organizations. The City Manager (Director of Emergency Management), Assistant City Managers (Assistant Directors of Emergency Management), and Coordinator of Emergency Management with assistance from department directors or their representatives, will direct and control severe weather emergency operations.

The Planning Department will be responsible for coordinating weather reports and the overall situation report during EOC activation.

Emergency Support Functions provided by Emergency Public Information, Law Enforcement, Fire, and Utilities, are described in greater detail by the City's Severe Weather Response Plan.

IV. CONCEPT OF OPERATIONS

A. This Incident Annex will provide information for all severe weather, including hurricanes and severe storms. Other severe weather activities includes tornadoes, windstorms, thunderstorms, heavy rains, lightning, hail, flooding, snowstorms, ice storms, severe cold, heat waves, and drought.

B. The diverse nature of severe weather poses a challenge to maintaining adequate monitoring of potential threats. The destructive nature of hurricanes and severe storms makes the total damage threshold difficult to estimate. The fast moving nature of severe weather, such as thunderstorms, flash floods, ice storms, and tornadoes require constant monitoring of conditions in order to provide an adequate response. Severe weather can cause other conditions, such as power outages or transportation slow downs that may last well beyond the actual weather event. The potential for loss of life is sometimes overlooked, especially for conditions such as flooding and lightning.

C. The Division of Emergency Management will monitor weather conditions daily, and coordinate with the *National Weather Service* (NWS) to identify potential situations, and provide adequate warning for City personnel and the citizens of Newport News. **All departments will be responsible for providing applicable situation and damage reporting to the Division of Emergency Management and/or the EOC during severe weather conditions.** Departments with personnel in the field who can provide critical first-hand information will require additional emphasis. When the EOC is activated, the Information and Reporting ESF will provide coordination of weather information as part of Situation Report responsibilities.

D. The Division of Emergency Management will coordinate with applicable City departments, such as Public Works, to identify potential areas of concern during severe weather conditions that may require special attention, or may require mitigation or preparedness actions. While all departments and City personnel are expected to individually monitor weather conditions as applicable to their responsibilities, The Division of Emergency Management will continue to research and develop methods and procedures to ensure the widest possible dissemination of information as quickly as possible.

E. During the buildup period as the storm approaches, close coordination will be required between the VEOC and the Newport News EOC. The EOP and the detailed action checklists for each department and organization will use uniform operation time periods to provide a timely and coordinated response.

F. Residents may be advised to evacuate their homes if a major storm threatens the area. The decision to evacuate will be made by the Emergency Management Director and will be based on the weather reports, decision arc results, and other local and regional information. Decision arc analysts and decision makers in the VEOC and the Newport News EOC will coordinate in determining when and where to evacuate. Major decisions relating to evacuation will be coordinated in advance with the VEOC, conditions permitting.

G. Federal installations (such as Joint Base Langley/Fort Eustis) will be semi-autonomous. They will take care of their own personnel, their families on-base, or evacuate them to another federal facility inland. Personnel and their families residing off base are considered to be a part of the general public.

SEVERE WEATHER EMERGENCY ACTIONS CHECKLIST

TO BE COMPLETED BY: DIRECTOR OF EMERGENCY MANAGEMENT

Started	Complete	Action Phases
		Normal Operations
☐	☐	Develop, maintain, and update Standard Operating Procedures/Emergency Procedures to implement the Emergency Operations Plan.
☐	☐	Track and monitor potential storm conditions.
		Alert Status
☐	☐	Continue to track and monitor storm conditions.
☐	☐	Perform appropriate initial alert notifications.
☐	☐	Review resource support procedures.
☐	☐	Review status of emergency resources.
☐	☐	Begin daily situation reports.
☐	☐	Test all emergency systems, equipment, and supplies.
☐	☐	Track all emergency expenses.
		Emergency Mobilization
☐	☐	Perform all notification procedures.
☐	☐	Continue to track and monitor storm progress.
☐	☐	Continue daily situation reports.
☐	☐	Perform EOC staff and department head briefings.
☐	☐	Initiate EOC activation.
☐	☐	Complete preparatory resource support actions.
☐	☐	Complete all system and equipment preparation.
☐	☐	Perform emergency public information advisories.
☐	☐	Continue to track all emergency expenses.
		Emergency Response Phase
☐	☐	Continue to track and monitor storm progress.
☐	☐	Continue daily situation reports.
☐	☐	Continue EOC staff and department head briefings.
☐	☐	Complete EOC activation procedures.
☐	☐	Continue to track emergency expenses.
		Recovery Phase
☐	☐	Coordinate life-saving response actions, including search and rescue activities.
☐	☐	Perform rapid assessment, initial damage assessment, and needs assessment procedures.
☐	☐	Coordinate needs requirements with VEOC.
☐	☐	Continue storm assessment procedures.
☐	☐	Perform minimum daily situation reports.
☐	☐	Continue EOC staff and department head briefings.
☐	☐	Determine recovery priorities.
☐	☐	Continue emergency public information updates and advisories.

APPENDIX 1

TO INCIDENT ANNEX A

HURRICANE HAZARDS AND VULNERABILITIES

OVERVIEW

Virginia has been affected by hurricanes since the early settlement days. On average of about two hurricanes each year come close enough to affect Virginia. Hurricanes have entered the state in less than half the years of the past century. The three most destructive hurricanes affecting Virginia were the hurricane of August 22-23, 1933, Hazel in October 1954, and Camille in August 1969. The August 1933 hurricane moved from the southeast and made landfall south of Norfolk. Tides in Norfolk were reported to be 9.7 feet above mean low water. There were 18 fatalities and damages of $79 million (1969 dollars) were reported. In October 1954, Hazel moved due north through central Virginia maintaining its intense circulation. Widespread damage occurred amounting to about $25 million (1969 dollars). There were 13 fatalities. The destruction caused by Camille in 1969 was largely the result of excessive rainfall (up to 27 inches) that caused flash floods and earth slides on the eastern slopes of the Blue Ridge. Damages exceeded $100 million, and fatalities numbered 151.

The classification of tropical cyclones into tropical depressions, tropical storms, or hurricanes depends upon the speed of the sustained surface winds near the center of the system. The Saffir-Simpson Hurricane Scale is the primary method used to quantify the potential storm surge and range of wind speeds, and relates hurricane intensity to damage potential. It assumes an average, uniform coastline and does not reflect the effects of varying bathymetry, coastline configuration, barrier, or other facts that would influence surge heights that occur at different locations during a single hurricane event.

Maximum surge heights by Saffir-Simpson hurricane categories were developed for 50 critical locations in the Southeastern Virginia Evacuation Study Area. These locations were identified by the county or City emergency management coordinators, and are generally located at low-lying roads and bridges that would be critical to an evacuation. In the case of the City of Newport News, the critical points were identified as Newport News Marine Terminal and Huntington Ingalls Industries.

The three major hazards produced by a hurricane are the storm surge, high winds, and rainfall. Of these, the storm surge is by far the most dangerous, historically causing nine out of ten hurricane related deaths. The high winds of a hurricane can also have a devastating effect on persons outdoors or inside unsound structures during the passage of the storm. Finally, although rainfall usually does not directly cause death in a hurricane, it may inundate potential evacuation routes and prevent persons from evacuating areas vulnerable to the storm surge.

1. Storm Tides and Wave Heights

Storm tides and floods account for over three-fourths of the deaths and much of the destruction associated with hurricanes. Much of their destructiveness results from the rapid rise of the tide. The storm surge is the difference between the storm-induced water level and the normal water level. Storm surge is also a name for the swell or dome of water pushed against the shore as a hurricane approaches land. On the open ocean, the surge may hardly be noticeable, but when it approaches shore, the effect is dramatic. The shallower the coastal water, the higher the surge. Depending on the conformation of the shore and ocean bottom, the storm surge may reach heights of eight feet or more above the normal (astronomical) tide level.

Many factors are involved in the formation and degree of propagation of a storm surge. These include, the intensity of the hurricane, the size of the hurricane, the forward speed of the hurricane, bottom conditions where the surge comes ashore, the position or angle of the hurricane's track as it crosses the coastline, and the physical configuration of the coastline where the surge comes ashore.

The more intense the hurricane, the higher the surge will be. Generally, shallow water locally off a coast where the hurricane comes ashore increases the surge height. Also, the closer to perpendicular that the track of the hurricane follows in relation to the coastline, the higher the surge will be. The presence of a major bay, inlet, or river mouth where the surge comes ashore can greatly amplify the height of surge as it travels with a "funneling effect" from the bay or river mouth to the back of the bay or up the river. The second important effect of the storm surge is its ability to inundate coastal roadways hours before the eye of the hurricane actually makes landfall (eye landfall). This would render such potential evacuation routes useless to vehicles attempting to flee from areas vulnerable to the approaching brunt of the surge.

2. High Winds

High winds also render certain segments of the population vulnerable to the passing hurricane and those persons should be evacuated. This hazard applies to residents of structures unable to withstand the stress and uplift forces from hurricane force winds. Hurricane force winds are defined as winds with a maximum sustained velocity exceeding 74 miles per hour (mph). Hurricane winds have been recorded as high as 190 mph.

Mobile homes are particularly susceptible to hurricane force winds. Mobile homes are necessarily of lightweight construction, with generally flat sides and ends. Because of these characteristics, the winds of hurricanes can toss mobile homes around, rolling them over and over to complete destruction. In addition, even a mobile home that is not overturned is quite vulnerable to smashing from other neighboring mobile home units rolling into it.

Although local regulations usually require that mobile homes be anchored to withstand high winds with "over-the-top" and frame tie-downs, anchorage system requirements usually are designed to withstand a wind velocity of from 70 to 110 mph. Because hurricane winds can reach 190 mph, the National Weather Service recommends that all residents of mobile homes evacuate to a more sound structure when threatened by the direct hit of a hurricane.

Just as with the analysis of the storm surge, the high winds hazard must not only be considered as to its predicted extent of effect, but also its timing effect. Dangerously high winds usually arrive at the coastline hours before the eye of a hurricane makes landfall. Evacuation activities cannot be safely carried out after the arrival of sustained gale force winds (40 mph with significantly higher gusts). Therefore, all evacuees should have completed their movement to their destinations before the arrival of sustained gale force winds.

3. Rainfall

No predictive tool is available for determining the rate and ultimate geographic distribution of the expected 6 to 12 inches of rainfall generally accompanying a hurricane. However, rainfall exerts only a minor influence on the transient water levels of a storm surge.

Rainfall in itself does not normally necessitate the emergency evacuation of large numbers of residents during the passage of a hurricane, as does the storm surge. However, as stated earlier, it may cause the early inundation of roadways sought as evacuation routes by vehicles attempting to escape from areas vulnerable to the approaching storm surge.

Even though rainfall normally does not directly cause loss of life, freshwater inundation of roadways preceding hurricane eye landfall could well cause the severing of evacuation routes, adding critical hours to the overall evacuation time.

VULNERABILITY

The City of Newport News has been divided into 18 hurricane evacuation zones. These zones were developed utilizing natural and man-made geographic features, and conform to existing political or demographic boundaries in order to facilitate the development of the necessary socio-economic data used in traffic modeling, as well as to determine shelter requirements of the evacuating population. Each zone

is also described in detail. The vulnerable population within each zone is comprised of those subject to storm surge, as well as all mobile home residents in non-vulnerable zones.

Mobile home residents are included in any evacuation due to the mobile home vulnerability to strong winds. Also, each evacuation zone includes the estimated tourist population of the City of Newport News.

TRANSPORTATION

Many assumptions have been made regarding the variables that impact upon the clearance time of the population at risk. Behavioral analysis has been conducted, and clearance times projected, by adjusting key assumptions to reflect varying physical and behavioral conditions in different storm intensity scenarios. Key assumptions were made in the following areas: permanent and tourist population data, storm scenarios, evacuation zones, behavioral characteristics of the evacuating population, and roadway network and traffic control. A brief overview of the analysis as it relates to the City of Newport News is provided below. To obtain a more detailed explanation of the variables and the parameters used, please refer to the study.

POPULATION AND VEHICLE EVACUATION PARAMETERS

Evacuation parameters are based on the number of evacuating people and vehicles for the City of Newport News. The information is presented in a range context as the numbers represent different storm scenarios and tourist unit occupancies, with the higher figures reflecting the impact of the most severe hurricane category in a high seasonal occupancy situation. Population and vehicle evacuation figures are broken down further by evacuation zones and storm category.

SHELTER DEMAND/CAPACITY CONSIDERATIONS

It is important to note that evacuating people and vehicle statistics generated for all jurisdictions in the study assumes that there will be adequate safe destinations available for evacuees. It was assumed, for the purpose of the study, that evacuees who were unable to be accommodated by study area hotel/motel space would find hotel/motel space outside the study area.

TRAFFIC VOLUMES AND CRITICAL ROADWAY SEGMENTS

Critical links and intersections for the City of Newport News are listed. These links are key areas for consideration for traffic control and monitoring. The Transportation Model Support document assigned evacuating vehicle figures for all roadway segments in each jurisdiction's transportation evacuation network, and volume to capacity ratios were calculated for each link. The roadway segments that had the highest volume to capacity ratios were identified as critical links for each jurisdiction.

ESTIMATED CLEARANCE TIMES

The time required to clear roadways of all vehicles evacuating in response to a hurricane situation is referred to as the clearance time. Clearance time begins when the first evacuating vehicle enters the road network and ends when the last evacuating vehicle reaches an assumed point of safety. Clearance time figures include mobilization time, travel time, and queuing delay time. It does not relate to the time any one vehicle spends on the road network. Clearance times are provided in the context of storm intensity, by rate of response on the part of the evacuating population, and by level of seasonal occupancy for the City of Newport News. Clearance times assumes local officials will evacuate residents out of dwelling units located in the areas shown as flooded by surge.

APPENDIX 2

TO INCIDENT ANNEX A

SAFFIR-SIMPSON SCALE

CATEGORY ONE

WIND SPEED: 74-95 MPH, 65-82 KTS. PRESSURE: >980 MILLIBAR, >28.94 IN. HG
STORM SURGE:4-5 FEET ABOVE NORMAL TIDE LEVEL DAMAGE: **MINIMAL**

Damage is primarily to shrubbery, tree foliage, and unanchored mobile homes. No real damage to other structures. Some damage to poorly constructed signs. Low-lying coastal roads inundated, minor pier damage, some small craft in exposed anchorage torn from moorings.

CATEGORY TWO

WIND SPEED: 96-110 MPH, 83-95 KTS. PRESSURE: 965-979 MILLIBAR, 28.5-28.91 IN. HG
STORM SURGE: 6-8 FEET ABOVE NORMAL TIDE LEVEL DAMAGE: **MODERATE**

Considerable damage to shrubbery and tree foliage. Some trees blown down. Major damage to exposed mobile homes. Extensive damage to poorly constructed signs. Some damage to roofing material of buildings. Considerable damage to piers. Marinas flooded. Small craft in unprotected anchorage torn from moorings. Evacuation of some shoreline residences and low-lying areas required. Coastal roads and low-lying escape routes inland cut by rising water two to four hours before arrival of hurricane center.

CATEGORY THREE

WIND SPEED: 111-130 MPH, 96-113 KTS. PRESSURE: 945-964 MILLIBAR, 27.91-28.47 IN. HG
STORM SURGE: 9-12 FEET ABOVE NORMAL TIDE DAMAGE: **EXTENSIVE**

Foliage torn from trees, large trees blown down. Practically all poorly constructed signs blown down. Some damage to roofing materials of buildings, some window and door damage. Some structural damage to small buildings. Some mobile homes destroyed. Larger structures near coast damaged by battering waves and floating debris. Major erosion of beaches. Low-lying escape routes inland cut by rising water three to five hours before hurricane center arrives. Evacuation of all residences within 500 yards of shore possibly required, and of single-story residences on low ground within two miles of shore. Serious flooding at coast and many small structures near coast destroyed.

CATEGORY FOUR

WIND SPEED: 131-155 MPH, 114-135 KTS. PRESSURE: 920-944 MILLIBAR, 27.17-27.88 IN. HG
STORM SURGE: 13-18 FEET ABOVE NORMAL TIDE DAMAGE: **EXTREME**

Shrubs and trees blown down. All signs down. Extensive damage to roofing materials, windows, and doors. Complete failure of roofs on many small residences. Complete destruction of mobile homes. Major damage to lower floors of structures near shore due to flooding and battering of waves and floating debris. Major erosion of beaches. Low-lying escape routes inland cut by rising water three to five hours before hurricane center arrives. Evacuation of all residences within 500 yards of shore possibly required, and of single-story residences on low ground within two miles of shore. Flat terrain 10 feet or less above sea level flooded inland as far as six miles.

CATEGORY FIVE

WIND SPEED: >155 MPH, >135 KTS PRESSURE: <919 MILLIBAR, <27.17 IN. HG
STORM SURGE: >18 FEET ABOVE NORMAL TIDE DAMAGE: **CATASTROPHIC**

Shrubs and trees blown down. Considerable damage to roofs of buildings. All signs blown down. Very severe and extensive damage to windows and doors. Complete failure of roofs of many residences and industrial buildings. Extensive shattering of glass in windows and doors. Complete destruction of mobile homes. Major damage to lower floors of all structures less than 15 feet above sea level within 500 yards of shore. Low-lying escape routes inland cut by rising water three to five hours before hurricane center arrives. Massive evacuation of residential areas on low ground within 5 to 10 miles of shore possibly required.

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APPENDIX 3

TO INCIDENT ANNEX A

STORM ASSESSMENT: DECISION ARC CONCEPT

The Decision Arc concept was developed as a manual hurricane evacuation planning and decision making tool to assist planners in determining when to evacuate. The information provided by the Decision Arc concept should be used in conjunction with other available information, as well as local and regional factors, to ensure the prompt, safe, and timely evacuation of the local population. The Virginia EOC will also provide a decision arc analysis for each locality in order to assist locals with their analysis and with their decisions concerning evacuation.

The DEM will provide a planner to serve as the Hurricane Decision Arc Analyst. This analyst must be trained in the use and interpretation of the specialized hurricane-tracking chart called the Decision Arc Map, the Decision Arc Table, and the Special Tool for the Omni-directional Radial Measurements, and the National Weather Service Marine Advisory. Training for decision arc analysts will be provided by the National Weather Service and the Virginia Department of Emergency Services.

The Decision Arc method uses a special decision arc map (tracking chart) in conjunction with a special tool for omni-directional radial measurements (STORM) to present a graphic illustration of the hurricane situation in relation to the local jurisdiction. To properly evaluate the reported position and forecast track of an approaching hurricane, special hurricane tracking charts have been developed for the separate geographical zones in the study area. The decision arc maps and STORM have a nautical mile scale. Weather Advisories and other information may be in English measurements or ZULU time, and will need conversion.

Local evacuation must be completed prior to the arrival of sustained 34-knot (gale force) winds, and the onset of storm surge inundation, or whichever comes first. The necessary pre-evacuation procedures should be completed prior to the time the decision point to evacuate is reached.

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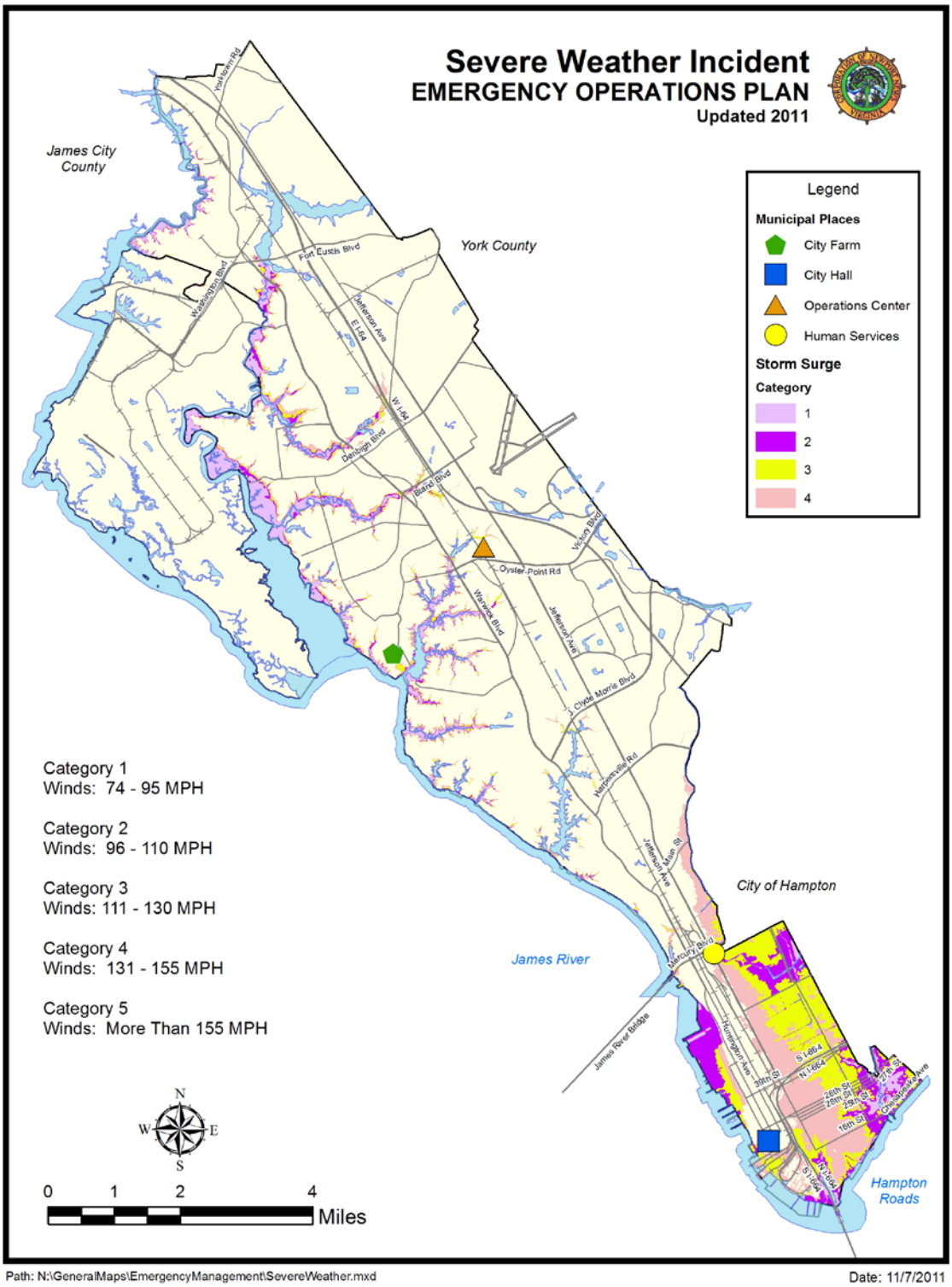
Severe Weather Incident
EMERGENCY OPERATIONS PLAN
Updated 2011
James City County
York County
City of Hampton
James River
Hampton Roads
Legend
Municipal Places
City Farm
City Hall
Operations Center
Human Services
Storm Surge
Category
1
2
3
4
Category 1
Winds: 74 - 95 MPH
Category 2
Winds: 96 - 110 MPH
Category 3
Winds: 111 - 130 MPH
Category 4
Winds: 131 - 155 MPH
Category 5
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