



# ROCKLAND COUNTY, NY FIRE AND EMERGENCY SERVICES - HAZARD RISK ANALYSIS

## Abstract

This paper will examine the Hazard Risk Analysis processes implemented by the Rockland County NY Fire and Emergency Services Team located at the Pomona (NY) Fire Training Center. Onsite interview with Chris Jensen, Program Coordinator at direction of G. Wren, Director F&ES and documentation review of RFES Hazard Mitigation Plans and program deliverables

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Gary Lehman  
 Gary.Lehman@jjay.cuny.edu

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## **Rockland County – Geography and Demographics**

Rockland County is located twenty miles north of Manhattan, on the west side of the Hudson River (a map of Rockland County is located in Appendix Nine). Rockland is rich in American history (particularly Revolutionary War); its quarries were the source of most of the concrete for pre-WWII era Manhattan buildings; and is the smallest county in New York State (approximately 176 square miles). 2/3 of the county land area is built, with the remaining 1/3 being park land offering extensive outdoor recreation opportunities including iconic Bear Mountain State Park. The population census of this ‘bedroom community’ in 2010 was approximately 311,000 - and a dramatic increase in number and degree of ethnic diversity has occurred since that last census. With a growing population in number and diversity, there is great interdependence amongst the communities -- and thus higher correlation of disaster planning imperatives and consequences result from the increasing human to human contact. The country’s largest construction project is currently underway: a new bridge to replace the aging Tappan Zee Bridge across the Hudson River, connecting Nyack on the west with Tarrytown on the eastern terminus. <sup>1</sup> One of the country’s largest indoor shopping malls is located in West Nyack, featuring an indoor Ferris wheel, ropes course, and indoor go-kart race track among other entertainment facilities. (Center P. , 2015) Rockland County was particularly hard-hit in 9/11 with many firefighters and police officers living here and working in Manhattan. Many companies in Rockland also have downtown offices and facilities, such as Verizon. On the day of the attack, employees in Rockland were gravely concerned over the fate of their coworkers in the downtown locations. Numerous monuments are in place in Rockland in honored memory of those lost on 9/11.

## **Rockland Fire and Emergency Services (RFES)**

RFES is located at the Rockland County Fire Training Center at 35 Firemen's Memorial Drive in Pomona, NY. The Pomona Fire Department is collocated at this site, along with the Emergency Operations Center in the basement whose operations are discussed below. Inbound training for local and regional fire departments and corporate and other institutions are conducted on premises. Extensive outdoor training scenarios including hazmat and firefighting training using residential structures is located on the training campus. RFES has also taken a leadership role in training for multi-agency collaboration for FEMA Region II. “RFES, in conjunction with the International Association of Fire Chiefs and FEMA’s National Training and Education Division, announced collaborative training for mid to senior level emergency management, EMS, fire, law enforcement, public health, public works officials and private sector leaders.” (Services R. F., Training for Regional Collaboration , 2013)

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<sup>1</sup> This new bridge construction has been the site of several collisions by river traffic with stationary barges holding construction materials with several drowning deaths resulting. <https://vimeo.com/140797200>

RFES/Fire Departments have lead responsibility in Rockland County NY for Emergency Function Support #4<sup>2</sup> **Firefighting** (4, 3/15/2016); Emergency Support #10<sup>3</sup> **Oil and Hazardous Material** (10, 2013); and ESF #5 **Emergency Management**<sup>4</sup> (5, 2008) and EST #14 **Long Term Community Recovery and Mitigation** (14, 2008). A listing of (and discussion of) RFES responsibilities for each of these disciplines is included in the appropriate Appendices.

RFES is responsible for public safety for five townships and nineteen villages in Rockland County. An extensive and current inventory of fire departments, equipment, contacts, emails, websites, E911 response procedures, response protocols, radio frequency, medical facilities, fire advisory board members, fire safety training and programs, helicopter support, ambulance corps locations/contact information, neighboring community fire departments, and fire department positions (i.e. fire inspectors, chiefs, fire safety and prevention officers, radiation officers, PIOs, chaplains, juvenile fire starter contacts, etc.) is maintained by RFES, and this guide available for inspection and review online at <http://rocklandgov.com/files/3614/4969/2821/FireDirectory2015Web.pdf> (Services R. F., Rockland County Fire and Emergency Services Directory, 2015)

### **RFES Hazard Risk Analysis Process**

The generic emergency management process calls for

1. identification of hazards
2. assessment of those hazards (rough calculation of risk = hazard X likelihood of occurrence X consequence of occurrence)
3. prioritization of risks
4. mitigation/planning/preparation for the risk

In practice each of these generalized steps include detailed actions, such as exhaustive research into neighborhood and community knowledge bases and experiences which will identify a large number of hazards; focusing in on the most important hazards (in the judgment of the interdisciplinary assessment team); the location(s) and range of the hazards must be documented; public safety groups and equipment assets need to be mapped relative to the identified hazards; assess how vulnerable the community-at-large is to the hazards; then create various alternative mitigation plans (choosing the best alternatives) and finally assessing effectiveness. This is the process (at a slightly deeper level) which is in place by RFES.

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<sup>2</sup> Please see Appendix Five for partial listing of responsibilities

<sup>3</sup> Please see Appendix Six for partial listing of responsibilities

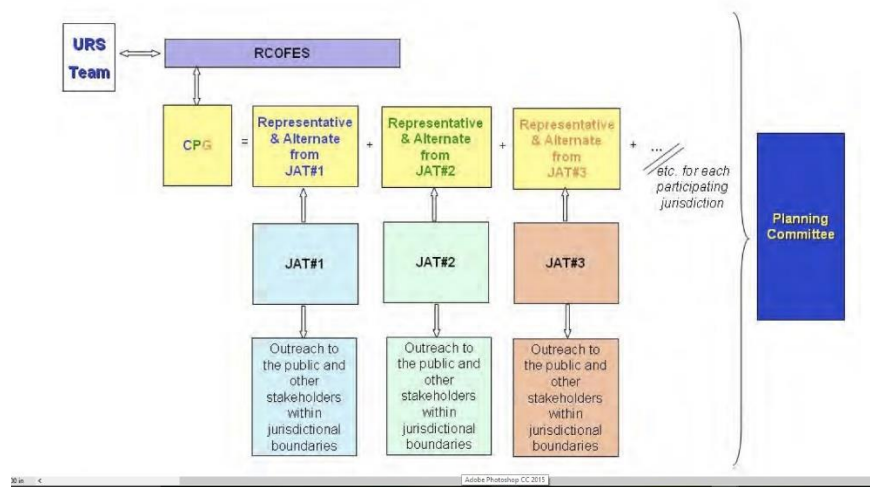
<sup>4</sup> Please see Appendix Seven for overview of ESF #5 responsibilities

## Hazard Risk Analysis Process – The 2010 Multi-Jurisdictional Natural Hazard Mitigation Plan

The above plan was funded by FEMA and implemented over a series of meetings starting in November 2008 and through 2009, concluding in 2010. The objective was to identify hazards which threaten the County, assessing the risks, prioritizing the hazards based on the risks involved, and determining ways to reduce future damages associated with these hazards. As such, this natural hazard mitigation plan it should be a perfect case study for the purposes of this assignment, namely to understand how my community identifies, ranks, and mitigates/plans for/prepares for the biggest perceived/identified risks. “...Funding was received under the Hazard Mitigation Grant Program for development of a multi-jurisdictional hazard mitigation plan for the County and as many of its 24 municipalities that chose to participate. This Rockland County Multi-Jurisdictional Natural Hazard Mitigation Plan represents the collective efforts of the county and all 24 participating jurisdictions, the general public, and other stakeholders.” (Services R. F., 2010). The sections below describing the Plan processes include quotes from the study

The study was organized as follows:

Figure 1.4 – Planning Committee Organizational Structure



The advantage of this organization was that local expertise and knowledge was compiled by the local jurisdictions into the various Jurisdiction Assessment Teams (JAT); representatives of the JAT teams comprised the Core Planning Group, who in turn interfaced with the Rockland County Office of Fire and Emergency Services and the URS team. Thus the organization was streamlined and organized for optimal progress with functional specialization.

The Planning Committee exercised due diligence to involve the public with the plan and provide updates about the plan to all who sought information about the work in progress. There were various mechanisms provided to do so:

- Rockland County Multi-Jurisdictional Mitigation Planning web site
- Plan facts project fact sheet
- Multiple open public meetings throughout the process
- Regular public radio announcements
- Other outreach activities to community groups about the evolving, in-progress by RFES and CPG members'

Additional outreach to schools and businesses was achieved via presentations to and with Orange and Rockland Utilities, the Cornell Cooperation Education Office, Board of Cooperative Education Services, and the Rockland Business Association.

### ***Key Dates and Core Planning Group Meetings***

- November 20, 2008-- Project Kickoff and explaining methodology
- April 21, 2009 – Core Planning Group progress meeting. Discussed plan development progress and work effort in progress. Hazard identification, hazard profile steps and the risk assessment portion of the plan were reviewed
- June 4, 2009 – Risk assessment question and answer session. Draft presented: hazard identification, hazard profiles, asset identification, vulnerability assessment, range of mitigation actions
- June 18, 2009 – Mitigation strategy working session. At this working session, attendees conducted an evaluation and prioritization of hazard mitigation actions and developed an implementation strategy for selected mitigation actions
- Various work efforts continued through 2009 and into 2010, resulting in the final plan presented in October 2010

### ***Scope of the Study***

- *Atmospheric hazards*, including: extreme temperatures, extreme wind, hurricanes and tropical
- Storms, nor'easters, tornadoes, and winter storms;
- *Hydrologic hazards*, including: flooding, drought, storm surges and dam failures
- *Geologic hazards*, including: earthquakes and landslides
- *Other hazards*, including: wildfires'

It is important to note that this document gets annual revisions and revalidations, so that it is not a dusty piece of "shelf ware". This is a very important factor because the County is rapidly changing, is compact and has a lot of parkland which means that populated areas are pretty dense, and this highly interdependent with 'solutions' in one part of the community resulting in

*problems* in another sector... New construction in one location may mean introduction of drainage complications in another adjacent area.

### ***Participants***

Twenty-four Rockland County municipalities participated in the study. Attendance for every meeting was taken, and the results/action plans/responsible parties for action items at each meeting were carefully scribed.

### ***Inputs to the Hazard Mitigation Plan***

The local jurisdictions took into account a significant inventory of localized information in developing their jurisdictions' mitigation Capability Assessments. The jurisdictions looked at 'relevant plans, codes, and ordinances currently in place such as building codes, zoning ordinances, subdivision ordinances, special purpose ordinances, site plan review requirements, growth management ordinances, comprehensive plans, capital improvements plans, economic development plans, emergency response plans, post-disaster recovery plans, post-disaster recovery ordinances, and real estate disclosure ordinances.' The consultants considered FEMA's multi-hazard risk assessment methodologies; US Geological Survey landslide and soil sampling data; FEMA's NFIP flood plain metrics; GIS mapping studies; US Park Systems documentation; New York State Historic Preservation reports; US Army Corps of Engineers dam inventory/assessment; earthquake data; prior all-hazards reports compiled by RFES; demographic data and the Rockland County Plan for the 21<sup>st</sup> Century River to Ridge.

### ***Hazard Identification***

*A consultant (URS Consulting, of Wayne NJ) was used to identify natural hazards in each of the twenty-four municipalities. Each of the municipalities was then tasked to concur or modify the natural hazards identified for each municipality based on the consultant's research into historical records and their understanding of natural hazards.*

The municipalities were asked to complete the '*Land Uses and Development Trends Questionnaire*' and submit same to the Consultant. This questionnaire 'asked jurisdictions to: (1) describe development trends occurring within their jurisdiction, such as the predominant types of development occurring, location, expected intensity, and pace by land use; and (2) describe any regulations/ordinances/codes their jurisdiction enforces to protect new development from the effects of natural hazards.'

Municipalities were then tasked to complete and submit the ‘*Capability Assessment Questionnaire*’ to the Consultant. This questionnaire asked respondents to examine their jurisdiction’s abilities to implement and manage a comprehensive mitigation strategy, which includes a range of mitigation actions. The questionnaires requested information pertaining to existing plans, policies, and regulations that contribute to or hinder the ability to implement hazard mitigation actions. They also requested information pertaining to the legal and regulatory capability, technical and administrative capacity, and fiscal capability of each jurisdiction’.

Participating jurisdictions also ‘*provided feedback regarding problem areas in need of mitigation and possible mitigation alternatives.*’

Following Chart summarized the identified hazards:

**Table 3a.1  
Summary of Profiled Hazards by Jurisdiction**

Jurisdiction	Extreme Temperatures	Extreme Wind	Hurricane / Tropical Storm	Nor'easter	Tornado	Winter Storm	Dam Failure <sup>a</sup>	Drought	Flood	Storm Surge	Earthquake	Landslide	Wildfire
Rockland, County of	■	■	■	■	■	■	■	■	■	■	■	■	■
Airmont	■	■	■	■	■	■		■	■		■		■
Chestnut Ridge	■	■	■	■	■	■		■	■		■		■
Clarkstown	■	■	■	■	■	■	■	■	■	■	■		■
Grand View-on-Hudson	■	■	■	■	■	■		■	■	■	■		■
Haverstraw (Town)	■	■	■	■	■	■	■	■	■	■	■	■	■
Haverstraw (Village)	■	■	■	■	■	■	■	■	■	■	■	■	■
Hillburn	■	■	■	■	■	■	■	■	■		■		■
Kaser	■	■	■	■	■	■		■	■		■		■
Montebello	■	■	■	■	■	■		■	■		■		■
New Hempstead	■	■	■	■	■	■		■	■		■		■
New Square	■	■	■	■	■	■		■			■		■
Nyack	■	■	■	■	■	■		■	■	■	■		■
Orangetown	■	■	■	■	■	■	■	■	■	■	■		■
Piermont	■	■	■	■	■	■		■	■	■	■		■
Pomona	■	■	■	■	■	■		■	■		■	■	■
Ramapo	■	■	■	■	■	■	■	■	■		■	■	■
Sloatsburg	■	■	■	■	■	■	■	■	■		■		■
South Nyack	■	■	■	■	■	■		■	■	■	■	■	■
Spring Valley	■	■	■	■	■	■		■	■		■		■
Stony Point	■	■	■	■	■	■	■	■	■	■	■	■	■
Suffern	■	■	■	■	■	■		■	■		■		■
Upper Nyack	■	■	■	■	■	■		■	■	■	■	■	■
Wesley Hills	■	■	■	■	■	■		■	■		■		■
West Haverstraw	■	■	■	■	■	■	■	■	■	■	■	■	■

<sup>a</sup>Based on available dam failure inundation mapping only

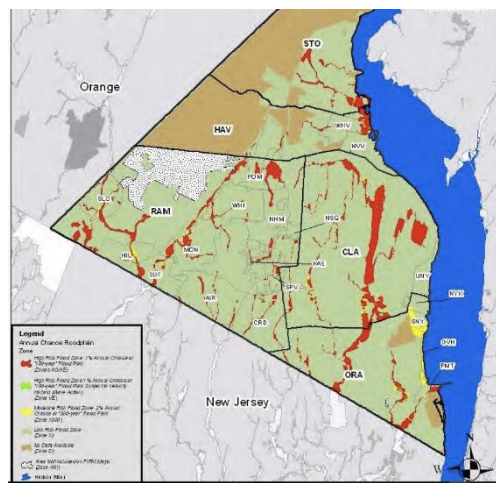


## Risk Assessment

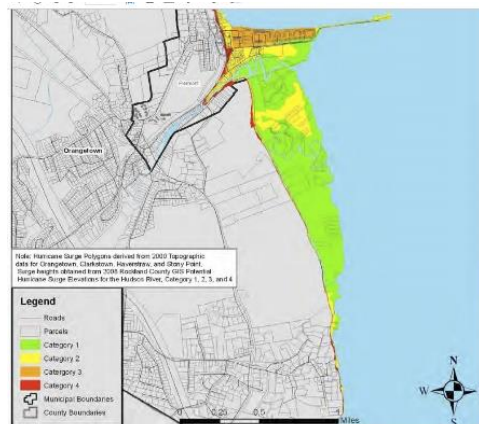
URS concluded that inland flooding was the biggest natural hazard. Dams were built in the post war period without consideration for future residential development, and thus these developments are now at risk as they exist in flood plains. While dam failure is a low probability, inland flooding due to excessive rainfall is always a threat and can cause these developments to have to be evacuated.

The NFIP conducts period flood plain mapping and these maps are superimposed against GIS data of residential development. This yields a disturbing 12% of Rockland's land area is in heavy to moderate flood risk zones.

### Rockland County Flood Hazard Areas



Other risks involving flooding are presented by storm surges, and the predicated areas of flooding in the below graphic (and several others in the report) map exactly to damage later experienced during Superstorm Sandy:



Source: Rockland County Department of Planning, Municipal Boundaries for Rockland County, NY, 2002; Hudson River, 2007; County Regulated Streams, 2008; Parcels 2008; ESRI, US Counties, 2005; US Census Borough, Census Roads, 2001.

URS also called out wildfires as a risk. With 1/3 of the land in Rockland dedicated to parklands and forested areas, and with increased residential building into previously undeveloped areas, the forest/built interface in wildfire hazard zones is certain to increase over time with an increase in risk to the public. URS concluded however the historic firefighting successes and historic experience reduced the overall level of concern for this hazard.

Taking stock of our risk calculation, let us review: **Rough calculation of risk = hazard X likelihood of occurrence X consequence of occurrence.** On behalf of Rockland County, URS has helped identify the hazards, and has determined by various means and methods the relative frequencies and likelihood of occurrence of the hazards, principally inland flooding, river/storm surges, and wildfires. What remains now to be done is for URS, in consultation with the jurisdiction partners and community and private sector participants, to determine what the consequences would be if these hazards materialize into risks and losses. In order to determine that, URS uses the following measures to define 'consequence'.

- *Damage to improved property*
- *Emergency facilities*
- *Critical infrastructure and utilities*
- *Other key facilities*
- *Historic and cultural resources*
- *Impacts to Population*

The URS consultants report offers the following prophetic comment regarding flooding along the Hudson: *"While it is likely that an increased number of assets could be susceptible to flooding, it is assumed that new structures will be built to codes that will offer a certain degree of protection from the most frequent events."* In the event of Sandy, it was these very same riverside communities which were badly damaged and in fact, much damage was sustained by both the older and the new structures. In the wake of Sandy, new construction (or those structures damaged in excess of 50% of their value) are required to be built 2 feet above the flood level as defined by NFIP.

URS had limited success in 'quantifying' the risk of most of the identified natural hazards, and to their credit, did *not* fabricate artificial risk assessments. The immutable fact is that risk assessment can be arbitrary and a policy decision has to be made as to whether or not to be agreeable to quantifying the essentially unquantifiable.

## URS Risk Assessment: Estimated Damages in Hazard Areas

### SECTION 3c - RISK ASSESSMENT: ESTIMATED DAMAGES IN HAZARD AREAS

U: Currently Unquantifiable but assumed negligible on an annual basis      U\*: Currently Unquantifiable but potentially significant on an annual basis

Jurisdiction	Total Value of Improvements	Extreme Temperatures	Extreme Wind	Winter Storms	Flood	Dam Failure	Storm Surge	Drought	Tornado	Landslide	Wildfires	Severe Weather Events	
Airmont	\$1,019,981,033	U	U	U*	\$7,504	\$6,357	U	\$0	\$4,520	U	U	U	U*
Chestnut Ridge	\$1,022,965,302	U	U	U*	\$7,526	\$5,490	U	\$0	\$8,764	U	U	U	U*
Clarkstown	\$11,975,516,228	U	U	U*	\$88,107	\$186,855	U	U	\$27,932	U	U	U	U*
Grand-View-on-Hudson	\$73,560,909	U	U	U*	\$541	\$1,381	U	U*	\$0	U	U	U	U*
Haverstraw (Town)	\$1,190,586,098	U	U	U*	\$8,759	\$18,814	U	U*	\$2,826	U	U	U	U*
Haverstraw (Village)	\$11,534,327,925	U	U	U*	\$84,861	\$273,402	U	U*	\$637	U	U	U	U*
Hillburn	\$67,206,306	U	U	U*	\$494	\$1,788	U	\$0	\$0	U	U	U	U*
Kaser	\$178,828,051	U	U	U*	\$1,316	\$3,664	U	\$0	\$0	U	U	U	U*
Montebello	\$893,054,028	U	U	U*	\$6,570	\$12,488	U	\$0	\$1,560	U	U	U	U*
New Hempstead	\$548,006,957	U	U	U*	\$4,032	\$3,504	U	\$0	\$1,604	U	U	U	U*
New Square	\$347,906,378	U	U	U*	\$2,560	\$132	U	\$0	\$160	U	U	U	U*
Nyack	\$877,010,136	U	U	U*	\$6,452	\$7,889	U	U*	\$52	U	U	U	U*
Orangetown	\$6,202,226,077	U	U	U*	\$45,632	\$38,082	U	U	\$7,450	U	U	U	U*
Piermont	\$193,128,141	U	U	U*	\$1,421	\$2,923	U	U*	\$350	U	U	U	U*
Pomona	\$1,987,772,201	U	U	U*	\$14,625	\$4,541	U	\$0	\$0	U	U	U	U*
Ramapo	\$3,348,049,523	U	U	U*	\$24,633	\$24,631	U	\$0	\$8,142	U	U	U	U*
Sloatsburg	\$281,597,316	U	U	U*	\$2,072	\$4,175	U	\$0	\$944	U	U	U	U*
South Nyack	\$366,695,433	U	U	U*	\$2,698	\$2,232	U	U*	\$204	U	U	U	U*
Spring Valley	\$2,671,443,844	U	U	U*	\$19,655	\$39,124	U	\$0	\$422	U	U	U	U*
Stony Point	\$1,889,175,927	U	U	U*	\$13,899	\$62,844	U	U*	\$10,454	U	U	U	U*
Suffern	\$1,237,078,193	U	U	U*	\$9,102	\$20,635	U	\$0	\$131	U	U	U	U*
Upper Nyack	\$375,811,891	U	U	U*	\$2,765	\$1,802	U	U*	\$3,657	U	U	U	U*
Wesley Hills	\$719,544,527	U	U	U*	\$5,294	\$3,469	U	\$0	\$0	U	U	U	U*
West Haverstraw	\$5,543,890,025	U	U	U*	\$40,788	\$9,003	U	U	\$190	U	U	U	U*
<i>County Total:</i>	<i>\$34,545,362,446</i>	<i>U</i>	<i>U</i>	<i>U*</i>	<i>\$401,306</i>	<i>\$735,224</i>	<i>U</i>	<i>U*</i>	<i>\$80,000</i>	<i>U</i>	<i>U</i>	<i>U</i>	<i>U*</i>

### Hazard Prioritization

A wide variety of mitigations were developed by the Jurisdiction Assessment Teams against these natural hazards. The general categories listed below were each accompanied by a variety of specific mitigation actions to reduce the frequency and/or severity of future occurrences:

- Promote disaster resistant development
- Build and support local capacity to enable the public to prepare for, respond to, and recover from disasters
- Reduce the possibility of damage and losses due to drought
- Reduce the possibility of damage and losses due to flooding caused by floods, hurricanes, and nor'easters
- Reduce the possibility of damage and losses due to earthquakes
- Reduce the possibility of damage and losses due to landslides
- Reduce the possibility of damage and losses due to storm surges
- Reduce the possibility of damage and losses due to dam failures
- Reduce the possibility of damage and losses due to wildfires
- Reduce the possibility of damage and losses due to winter storms
- Reduce the possibility of damage and losses due to extreme temperatures
- Reduce the possibility of damage and losses due to tornadoes and high winds caused by windstorms, hurricanes and nor'easters
- Reduce the possibility of damages to emergency facilities from flooding, wind damage and wildfire damage

The next phase in the prioritization involved the Core Planning Group members analyzing the full range of possible actions identified above (there were multiple actions per bullet item). This involved a three-step process for deciding upon particular mitigation actions:

1. External mapping of actions above against hazards identified in each jurisdiction
2. Core Planning Group Members developed a most 'valuable mitigation action list' by assessing the action items in the light of risk assessment and unique local considerations. This eliminated many action items, although an assessment was made of each in turn
3. ***For the subset of preferred action items, Core Planning Group Members conducted a detailed analysis and prioritization using FEMA's Social, Technical, Administrative, Political, Legal, Economic, and Environmental (STAPLEE) approach.*** (386-5, 2007) The Method B: Relative Rating approach, assigning relative scores to the actions based on qualitative factors was used. The rating of costs and benefits as 'High, Medium, and Low' clearly emphasizes the Benefit-Cost Review (p.10).

(Example of a Prioritization Sheet included in Appendix Eleven. Example of a Implementation Strategy Worksheet included in Appendix Twelve)

### ***Mitigation Plans/Preparations***

Each jurisdiction developed an implementation strategy for their preferred action items which they selected and prioritized. The implementation strategies were different for each jurisdiction. 'The implementation strategy developed by each participant was based on each participant's qualitative analysis of social, technical, administrative, political, legal, economic, and environmental benefits and costs associated with each selected action.' After the jurisdiction develops their implementation strategy, it is incumbent on the jurisdiction (to be FEMA compliant,) to energetically engage with the community with high priority public outreach to civic groups, via their website, TV spots, radio, to businesses, flyers, newspapers, newsletters and by whatever other means to get the message out as to the implementation strategy developed.

***Summary Hazard Risk Management Observation:*** To sum up this process, the consulting firm URS determined (based on regional history and FEMA sources among others) what the natural hazard risks were in each Rockland County geography. The various Jurisdiction Assessment Teams then all reviewed/concurred/added additional vulnerabilities (and their comments) to the URS findings. There was some fancy methodology around risk assessment of those hazards, but the risk was essentially unquantifiable in any real sense. The communities then all went off, huddled and prioritized their individual improvements using FEMA's STAPLEE methodology. Human judgment tweaked the results; the benefit/cost was qualitative in nature (necessarily). The last step was to pull together a jurisdiction-specific mitigation plan. And then...generally

speaking... the communities hoped that grant funding would be provided at some point in the future to put into effect the infrastructure improvement/risk mitigations for these natural hazards.

This general process of hazard identification, followed by risk assessment/calculation, mitigation development, mitigation prioritization, and implementation of the identified and high priority improvements is also used to mitigate man-made hazards by the Rockland County Fire and Emergency Services team. There are some special considerations around terrorism, which will be reviewed at the end of the following section, SWOT for RFES.

## SWOT for Rockland Fire & Emergency Services

**Strengths** RFES has a *committed, dedicated 100% volunteer fire fighting team* which also provides hazmat containment and clearing and underwater search/rescue, technical rescue and search/rescue operations. The team has access to an extensive training roadmap and conducts comprehensive fire extinguishment drills, as well as numerous HazMat situation drills conducted at the regional center of fire training excellence co-located at the Pomona Fire Training Center (FTC). (Center F. T., 2916) ‘Over the years, we have educated thousands of firefighters from all over the tristate area in the areas of fire prevention, protection and suppression’. (Services R. F., RFES, 2016) <sup>5</sup> RFES offers National Fire Academy Outreach courses, New York State Office of Fire Prevention and Control Fire Service Outreach courses, and over 300 Rockland County Fire Training Courses. The FTC also conducts industrial and institutional fire safety training as a fee-based services. Rockland and surrounding communities benefit from RFES’s tightly-integrated hazard identification /mitigation / preparedness and response capability. RFES conducts multiple quarterly table top training and full-field exercises for the primary hazards of inland flooding, hazard material release, and Indian Point nuclear accidents.

The various *disaster management training sessions include multiple Emergency Operations Center exercises*. The EOC in the Fire Training Center is linked to other regional EOC’s in neighboring counties (even in a different state, New Jersey). The EOC is exceptionally well equipped with multiple, reconfigurable flat panel monitors; highly function-oriented organization featuring a breakout room for private leadership consultations and ‘time outs’; state-of-the-art GIS capability; comprehensive representation from all emergency management disciplines and stakeholders; a control room for social media monitoring and management, and a pantry enabling extended operations. A few additional words are warranted about the social media monitoring. One of the key objectives is to stay aware of any building rumors and to manage them down as soon as they are identified. Monitoring Facebook and Twitter (principally) is the means by which Rockland County emergency executive management can be apprised of ‘the rumor mill’. While under normal circumstances it would be impossible (and inadvisable) to shut down social media, it is important for leadership to be aware of the trending comments and feedback from first observers. Another important function is that social media can help identify dynamic situations on the ground. RFES’s dedicated social media monitoring room is centered on these objectives. <sup>6</sup>

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<sup>5</sup> Fire Training: [http://rocklandgov.com/files/7913/6819/3475/ROCKLAND\\_COUNTY\\_COURSES\\_BY\\_COURSE.pdf](http://rocklandgov.com/files/7913/6819/3475/ROCKLAND_COUNTY_COURSES_BY_COURSE.pdf)

<sup>6</sup> A partial listing of Emergency Operations Center participating organizations is listed in Appendix Eight

RFES is part of a regional Emergency Planning Zone within a ten-mile radius around the Indian Point nuclear energy plant located on the Hudson River at Buchanan, NY. The plant is operated by Entergy, which collaborates with local surrounding community Emergency and Fire Services public safety groups and the Westchester, Rockland, Orange and Putnam County governments. Extensive planning and multiple yearly drills are conducted, and Entergy is part of the emergency response team in the event of a nuclear plant incident. Engineers from Entergy would be dispatched to the Hawthorne NY EOC (across the Hudson River in neighboring Westchester County) and would be involved with EOC to EOC video situation management. (Entergy, 1998-2015)<sup>7</sup> RFES reviews in depth the Indian Point Emergency Planning Guide with community groups to review procedures, recommendations and to answer the questions which Rocklanders will have about the Indian Point nuclear power plant and how to respond in the event of any plant operational anomalies. (Publication, 2015-2016)<sup>8</sup> (It should be noted that Rockland Fire and Emergency Service, in response to situational mismanagement during the Three Mile Island nuclear reactor meltdown in 1979, had already established a comprehensive communications and response plan - well in advance of the Nuclear Regulatory Commission mandate which followed 9/11).

*RFES makes significant use of GIS* in collaboration with other Rockland County agencies. GIS is relied upon in RFES's disaster response planning to assess ingress/egress points and potential bottlenecks. GIS is also used in conjunction with land use planning authorities to help configure the residential and services infrastructure of the *future* Rockland County. RFES input into the recovery planning discipline of emergency management makes extensive use of GIS for the purposes related to storm water management, environmental reviews, easements, zoning, land use planning, and predictive assessments. These factors are of particular importance to Rockland County given that the primary natural hazard risk in Rockland is inland flooding. Hurricane Irene dropped 11" of rain in several hours, creating massive inland flooding. Superstorm Sandy also created inland flooding, but the tidal and river surges along the Hudson River were the principle threat during Sandy; many businesses and homes (especially those near the banks of the Hudson River) were badly flooded and were unable to sustain operations due to losses incurred during Sandy. GIS is also used to spatially search the Special Needs Registry's database<sup>9</sup>. The system then generates a report of the special needs individuals found within the user-specified location on the map. GIS plays a central role in Hazmat accident/spill management. In the event an accident occurs, users can quickly identify the area affected by the spill or contamination. Inputting wind speed and direction will allow the user to plot/visualize the projected progress of airborne contaminants.

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<sup>7</sup> See Appendix One for Emergency Planning Zone GIS map

<sup>8</sup> See Appendix Two for front cover of the Rockland County Indian Point Emergency Guide

<sup>9</sup> See Appendix Three for the cover page of the Special Needs Registry

For hazmat spill assessment and management, state-of-the-art sampling technology is used to immediately identify chemical substances for effective mitigation in the event of a hazmat or toxic spill.

*Extensive training with technology and inter-departmental collaboration pays off:* In March 2015, Haverstraw Volunteer Fire Department (VFD) was dispatched to a propane/potential chemical spill and discovered a very large propane tank leaking. Haverstraw requested assistance from the West Haverstraw VFD to secure nearby roadways to isolate the area. The hazmat team came onsite and the RFES Assistant Director consulted with both Chiefs in the Command Post. The decision was made to insert an Entry team with flash protection suits to recon the leak and assist developing the NIMS-compliant Incident Action Plan (IAP). Then the Entry team utilized a newly-acquired camera system to provide the Chiefs and Assistant Director in the command post visuals; and the team employed three Honeywell MultiRAE wireless gas/chemical detectors to feed real-time data to the Science Lab for substance/gas identification. (MultiRAE, 2015) After two hours the leak from the broken regulator was contained and the property returned to the owners. (Services R. R., 2015)

*A full-scale multi-agency field training exercise* was conducted in Orangeburg (Safety Train, 2011) in July 2015 which provided valuable training and preparedness enhancement. (CSX, 2014) (Vosizneias, 2015). The exercise involved a simulated crash between a freight train carrying crude oil and a vehicle in the Rockland town of Orangeburg. CSX rail lines run through many communities and along the western bank of the Hudson River, so training of this kind is crucial in Rockland County. Dozens of volunteers (including 40 crash “victims”, with onsite triage and some requiring ‘medical evacuation’) and over 35 agencies (including some from neighboring Bergen County, New Jersey) participated. Agencies included New York State Department of Environmental Conservation, New York State Division of Homeland Security and Emergency Services, New York State Department of Environmental Conservation, Rockland County Sheriff’s Office, Rockland County Department of Health, Rockland County Community Emergency Response Team, Rockland County Helicopter Emergency Lift Program, Rockland County HazMat, Rockland County Local Emergency Planning Committee (LEPC), CSX Transportation, United Water and Orange and Rockland Utilities. Also participating were numerous ambulance corps and several police and fire departments. The CSX Safety Train was used for the exercise. RFES’s Post Incident Review of the exercise was very positive. (For a discussion of the LEPC, please see Appendix 10)

This field exercise was conducted in compliance with the Superfund Amendment and Reauthorization Act of 1986 (SARA, 2016). The exercise implemented the HazMat Emergency Response Plan which was inaugurated in 1988 and is revised yearly. There are approximately



100 hazardous chemical sites that fall under the reporting requirements in Rockland. Per SARA requirements, RFES maintains the HazMat ERP as well as maintaining a capability to respond to community requests for information about chemicals and chemical spills in the County. The ERP includes “emergency notification procedures; methods for determining the occurrence of a chemical spill and the probable affected area and population; identification of emergency facilities and the persons responsible for them; evacuation plans, training requirements for emergency response personnel; and standard operating procedures for response personnel” (SARA, 2016).

*RFES leverages computer-based disaster simulation training.* These software modules have the objective of training participants to pre-visualize scenarios, and upon repetition of the exercises to develop an automatic, structured situation response. The simulations are dynamic so that the trainee learns pattern-matching skills and practices design-making and situational awareness in a changing environment. (The idea is that with these modules, whatever solution worked last time, probably *won't* work this time...so for consistently positive outcomes, the learner has to establish situational awareness and then quickly develop effective responses.) The simulation software is called ADMS (Advance Disaster Management Systems) and the instructors and trainers convene at the Rockland County Fire Training Center (RCFTC). The staff and RFES continually review and improve existing scenarios, and develop new ones. ADMS is part of an overall computer simulator suite of applications for all Emergency First Responders at the RCFTC. The other modules include Fire Studio, FlameSim, Driver Simulator, MILO and the Bullex Fire Attack Simulator. (Systems, 2016)

RFES has an *engaging community outreach program*, consistent with and compliant with the Whole Community Concept. (FEMA, Whole Community, 2015). RFES conducts a committed community outreach campaign ensuring communications with all sectors of the Rockland community. These include Kiwanis; Parent Teacher Associations; religious communities; cultural associations; outreach to the senior communities; Scouting groups; K-12; local private colleges/universities including Rockland Community College; private sector and local trade associations. RFES also is currently preparing for its National Voluntary Organizations Active in Disasters (NVOAD) initial Executive Committee Kickoff (steering/planning meeting) to be held during the month of April 2016, with the objective to build relationships/roles/responsibilities. (Coppola, 2014). Following is a partial and representative list of NVOAD participants which includes both twenty-five non-profit and several retail organizations: Catholic Charities; Jewish Family Services; Red Cross; PC Richards (electronics and appliances); Home Depot; Raymour and Flanigan (furniture); Big Brothers/Big Sisters; Headstart; People to People (Rockland County food pantry); Community Awareness Network For A Drug-Free Life (CANDLE); Rockland County Office for the Aging and the Rockland Independent Living Center (among many others; a number of others are expected even though these organizations are not yet formally added to

the Steering Committee). RFES’s community education program is an important contributor to public safety in Rockland, addressing many issues of great concern and value to the community these include:

Baby sitters	Early warning devices	Home Exit Drills	Mobile and home fire safety	Fire safety for Elderly	Fire safety, handicapped	Juvenile fire starters	Fire extinguisher training
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RFES also has an *active Community Emergency Response Team* organization, training local civilians for service in disasters. CERT is engaged with local public safety drills and exercises to form relationships and connections so that, in the event of a county disaster, CERT can engage quickly and seamlessly into public safety disaster operations -- in a helpful, safe, and appropriate capacity, for which the individuals have been trained and are expected to perform on behalf of the public and the emergency response organization involved. RFES also reaches out to community groups to advocate for personal emergency preparedness on a family and neighborhood level, in accordance with the objective of improving self-sufficiency in the event of emergencies. (FEMA, how you can plan and prepare to protect your family, property, and community from natural and manmade disasters., 2016)

The possible need for self-sufficiency until disaster relief arrives is on the agenda for meetings with senior communities and meetings with those who have special access and functional needs. To meet this challenge, *RFES extends special outreach under the auspices of the Rockland County Office for the Aging and the Rockland Independent Living Center* to ensure that these groups and their members are equipped with information for disaster pre-planning and evacuation/sheltering and other general preparedness procedures. (County Government, 2016) (Center R. I., 2016) RFES maintains a database of those who may need specialized assistance (with periodic review of aging seniors with facility staff members) and makes the commitment to be topside on behalf of these communities <sup>10</sup> in the event of an emergency or disaster.

**Weaknesses** Rockland County is growing by leaps and bounds. Rockland is an increasingly diverse bedroom community with a large commuter population which travels to/from Manhattan each day and to local businesses here and in neighboring counties such as Westchester NY and Bergen County, NJ. This creates a need for increasing emergency services capacities to protect the expanding population. Building inspection staffing must be examined to ensure it is commensurate with the radically increasing housing growth (in particular, of light construction which is inherently more vulnerable to rapid fire spread). *It is crucial for Rockland’s leadership to ensure that funding for the increasing workload and complexity of RFES*

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<sup>10</sup> See Appendix 3 for Ready Rockland – Guide for Seniors and People with Access and Functional Needs

*is provided* in order to allow RFES to keep pace with the increasing complexities involved with the ever-expanding and increasingly diverse Rockland County population census.

**Opportunities** Advanced technologies would have a ready and important role to play in Rockland County. One which comes to mind is unmanned aerial vehicles which can play a role in situational assessment and awareness for public safety teams responding to fires, emergencies and both weather-related disasters and man-made disasters. Mobile video analytics might be combined with UAV's and command vehicle computers to assist with complex situation management. <sup>11</sup> *The successful situation outcomes achieved by RFES leveraging advanced technologies positions the team for rapid and effective introduction and production use of more of these technologies.* An example is the successful production use of the real-time MultiRAE gas detection meters, detailed above.

**Threats** While distinctly and definitely not a 'threat', one of the challenges of this growing Rockland County community involves a *growing undocumented immigrant population*; growing and vibrant communities which have at times limited English language reading and writing skills among some of the population. In addition, these communities are not accustomed to working with government officials and representatives in their countries of origin and that carries forward; and are in fact at times *distrustful* of '*federales*' and even public safety workers.

Another category of threat is the *rapid proliferation of lightweight residential construction of potentially variable construction quality*. A challenge for Rockland County and many others is rigorous persistent and unannounced code inspection/enforcement of these residences. These residential housing units might be nominally code 'compliant', but shortcuts in materials and shoddy construction shortcuts might be discovered with unsealed, incomplete ceiling to floor connections, unsealed poke-throughs, open wiring chases, substandard materials, and the like. These shortcuts can be deadly, causing fast-moving fires and can be a dangerous threat to the occupants. Another problem faced by RFES is undocumented and unauthorized interior space modifications in stairwells, ceilings, attics – these changes are made to the structures to accommodate multiple families in single family dwellings. This is a particular problem in certain ethnic and religious communities, and the challenge is to inform and advise these groups of the dangers imposed by these modification, with the hope of achieving sustained corrective behavior and practice in these communities. These dangerous residential modifications combine to endanger not only the occupants, but also the firefighters who respond to fires in these residences and who are then faced with complicated and thus dangerous interior space navigation during a fire.

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<sup>11</sup> Please see Appendix Four for an advanced technology concept chart for firefighting using video analytics and UAV formerly presented to Professor McCrie's class on Security Operations Management

Another threat in the community are *corporate mergers and consolidations* which have decreased the corporate census in Rockland County in certain sectors. This has resulted in the closing of some major pharmaceutical concerns and service sector industries. The impact to RFES is that there are fewer corporate partnerships available and/or scaling back of support, and decommitting of funding and expected/anticipated participation in disaster response training and responsibilities.

### ***Considerations Regarding Terrorism in Rockland County***

*Another threat category for Rockland County and RFES is domestic and foreign-national terrorism.* The last terrorist attack in Rockland County was the Brinks robbery conducted by the Black Liberation Army (FBI, Joanne Chesimard First Woman Added to Most Wanted List, 2013) and several former members of the Weather Underground (FBI, Weather Underground (Weathermen), 1976). The year of this incident, which resulted in the death of two Rockland County police officers and a Brinks security guard, was October 20, 1981.

Terrorism does not have a high profile with the RFES, in part because it hasn't happened *here* for so long in *this* county. When terrorism shows up as a concern during RFES team planning, the risk might yield to human judgment and be dialed down a bit; and for that matter FEMA's STAPLEE prioritization methodology is ill-suited to terrorism preparation. Terrorism is also in important ways more in the domain of the FBI/Fusion Center/State Police; and in the 'coverage zone' of local law enforcement. And we all lived through the period of intense focus on counter-terrorism in the wake of 9/11 – and all resources and focus moved there -- to the detriment of our collective capability in severe weather resilience and survivability. With the resulting travesty of Katrina. Thus there is an impulse to want to *not* overreact and overinvest scarce county resources to the threat of terrorism, in particular because Rockland County has been safe from it for so long. *Subjectively* speaking, we feel that we do not want to overreact to the threat of terrorism - because we don't want another Katrina-like situation to occur where we are caught unprepared for dangerous weather. And *objectively* speaking, we don't want to invest already-overburdened staff, time or funding money unduly in counter-terrorism because the last time anything like that happened here was thirty-five years ago, in 1981.

But it is important to keep in mind that there are inherent biases which are human nature. Availability bias is one factor: events that are more easily recalled are seen as more probable. A problem that occurred in 2015 or 2012 will "seem" more probable than one which occurred in 1991. (Groner, 2015). There is another bias known as the 'normalization of risk'. Two examples which John Jay College of Criminal Justice's Professor Emeritus Dr. Norman Groner uses are the space shuttles Challenger and Columbia. Engineers warned about the O-ring failure risk in the

cold weather the day of the launch; but Challenger had launched successfully *before*, and so was launched again on that fateful day with disastrous consequences. Similarly, 'normalization of risk' occurred *again* with the Columbia shuttle when foam struck the wing upon launch. This had happened already any number of other times *before* with no consequences. But stress on the tiles was an unconsidered factor, and again we as a nation soon faced another space shuttle disaster. "Delay of Effects" bias is another subjective contributor; the notion that nothing is imminent – which is why people smoke, and don't bother to change the batteries in their fire detectors. Finally, the last subjective bias at work is the 'confirmatory bias'. In this instance, the reviewer will read the newspaper or magazine which states a position with which he already agrees; hence 'confirmatory' bias. "The antidote to this bias is to search for and use *all* of the evidence available" (Groner, 2015).

The threat for Rockland County is that, like many other suburban bedroom communities, there exists in this county multiple soft targets. These include shopping malls with onsite movie theaters and restaurants, such as one of the country's largest: West Nyack Palisades Center (Center P. , 2015) and the new outdoor hybrid mall, The Shops At Nanuet (Simon, 1999-2016). The domestic terrorist threat executed in 1981 seems unlikely to be repeated against these malls. However the possibility always exists of an Aurora, Colorado-style mass-casualty event, or a Nairobi, Kenya Westgate Mall-style attack by either foreign national or domestic terrorists. (Reuters, 2013) There are also a number of colleges and universities in Rockland County, including Dominican College, Rockland Community College, St. Thomas Aquinas College, Nyack College, State University of New York Empire State College, and Iona College- all of which offer soft target opportunities for a domestic or foreign-national terrorist.

But what *could* RFES *itself* do to prevent a San Bernardino-style, a Paris-style or Westgate-style mall or Virginia Tech or God Forbid, a Newtown attack? Nothing within the established operational parameters which have served the people of Rockland County so well for so long. RFES is to be greatly commended for the Orangeburg full-field exercise conducted last year to prepare and train for positive response to hazmat/chemical spill; for the extensive firefighters and hazmat educational offerings at the Fire Training Center; and for the community outreach to a rapidly-expanding and intensifying diversity citizenry census, and for kicking off the NVOAD steering committee; and maintaining a database of community members at risk in the event of a natural or nuclear radiation disaster here in Rockland -- and most of all for all the valorous, skilled and successful results by the all-volunteer firefighters at work all over Rockland all these years. RFES is topside for its mission to envision, mitigate, prepare for, and respond to fires, natural and man-made disasters here in Rockland; and to maintain the emergency management infrastructure.

With that in mind, it is important for political leadership and public safety leaders to continue to think about the unthinkable. The fact that there has not been an attack in Rockland County since 1981 offers no certainty that one might not occur today, tomorrow or in the immediate future. The *public* never anticipated the Boston marathon attack. Fortunately however, the Commonwealth Fusion Center, Boston Police Department, and Boston public safety leaders did, and prepared extensively for the *possibility* of a mass casualty event. (Report, 2014) In that event, the thorough preparation – undertaken only on a *hunch* and knowledge that there was a *possibility* of a mass casualty event (but with no specific indications that there would be) - all came together to radically improve the outcome of that attack.

Our national intelligence infrastructure is keenly on guard for repetitions of Boston Marathon-style attacks. We have to bring it up a notch (and as a citizenry, if we see something, to say something) to prevent San Bernardino-style or Westgate Mall-style attacks. RFES must be funded and staffed adequately to be ready to plan and execute with its partner organizations the same kinds of effective preparations and responses as those provided by the Boston Police Department and Boston's emergency services teams; these teams did an exemplary job in both radically minimizing the casualties and quickly apprehending the perpetrators<sup>12</sup>. The relative risk here in Rockland increases commensurate with the welcoming and friendly atmosphere here, combined with the vibrant cultural and ethnic diversity we enjoy. Given the generically-increasing threat, it is incumbent upon Rockland County leadership to ensure that the public safety/law enforcement/FBI/private sector (i.e. mall owners) relationships and linkages are in place to 1) provide early detection of potential terrorist activities in Rockland and 2) have appropriate law enforcement and mass-casualty response capabilities for all contingencies. It is not known whether Rockland public safety and RFES has trained for a mass-casualty event. This potentially would be alarming to the citizens if a drill of that kind were conducted and publicized. In our open society and with a vigorous press (and legions of first informers and aspiring news reporters/photo journalists with smartphones) any such mass casualty drill would receive coverage. Perhaps it is best to conduct these drills in complete discretion and as internal-only (but rigorously intensive) tabletop exercises. That is a matter for our Rockland leadership to work through. But the benefits from such an effort are evident. In partnership with Fusion Center and local law enforcement efforts to keep us all safe, conducting mass-casualty drills on a regular basis either in full discretion or as a full-field exercise (or both) will help ensure that Rockland County's schools, malls, movie theatres and public spaces will continue to be secure for the future, continuing the legacy of well-being, enjoyment, and peaceful living Rocklanders have enjoyed for so many years.

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<sup>12</sup> Many victims arrived at Boston medical facilities with *no heartbeat*, but because the Emergency Rooms had been vacated, blood supplies were ready, and due to the fortuitous availability of ER doctors and staff who had personal experience with soldiers' IED injuries, there were only three fatalities at the attack.

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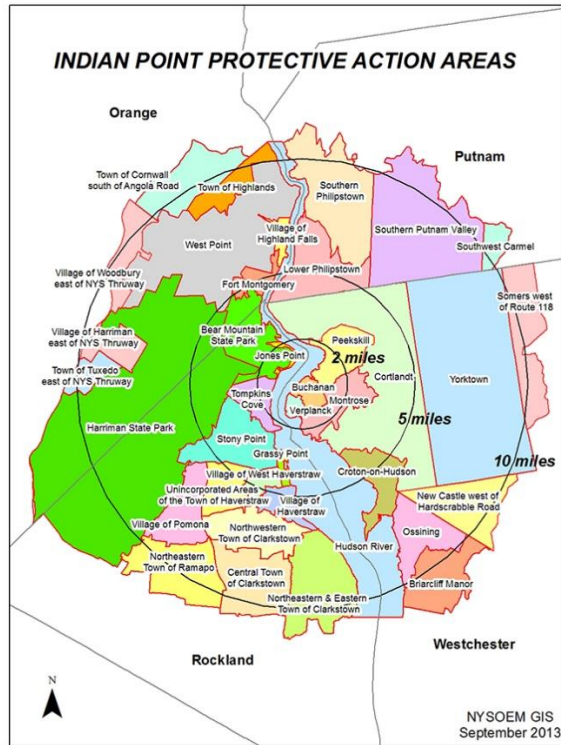
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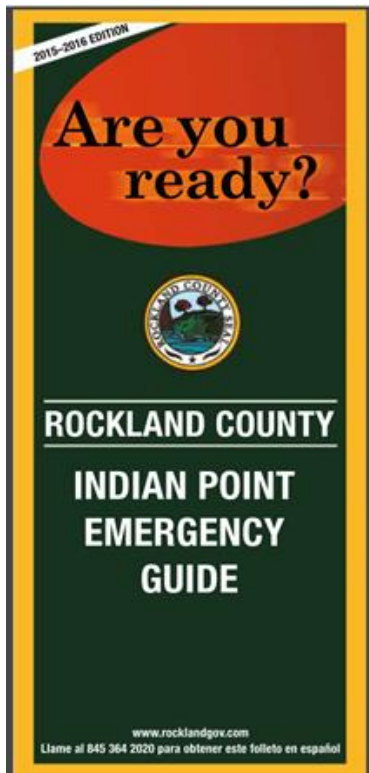
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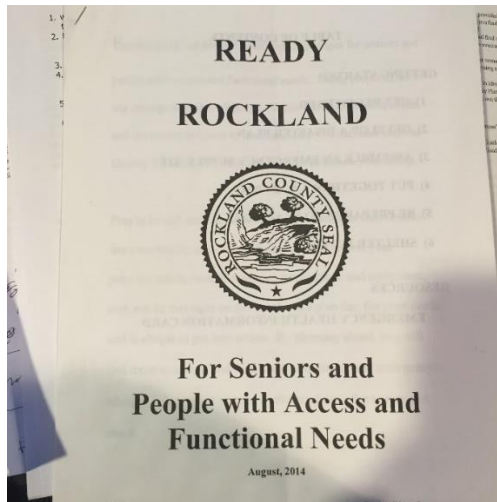
## Appendix One



## Appendix Two



## Appendix Three



## Appendix Four

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### Concept: Video Analytics for a Major Fire

Situational Awareness:  
 Overhead UAV → fire visuals  
 to Chief, who can plan attack  
 while enroute...

Secure Network (cloud)

UAV dispatched for topcover  
 (Possibly multiple UAV's)

**Video Analytics Functions:**  
*Documentation of ventilation /suppression tactics*  
*Radio transmission squelch reduction*  
*Simultaneous voice transmit separation*  
*Automated radio comms transcription*  
*Video: interior low light 'noise' reduction*  
*Software for video to "see-through" smoke*  
*Dynamic light correction (highlight/shadow)*  
*Create 3D grid with firefighters' locations (PASS)*  
*M/A 'Too High Temp'*  
*M/A 'Too Low Air in SCBA*  
*M/A heartrate/pulse ox (individual profile)*  
*(Above is important data for Post Incident Review*  
*Engineering analysis/fire dynamics recreation)*

Command/Control  
 Communications with  
 firehouse and Chief  
 proceeding to fire,  
**Video analytics**  
**Server on CCC**  
**truck**

Firefighter gear:  
 Helmet videocam  
 Radio, GPS and beacon  
 Temp: inside gear  
 Temp: outside gear  
 Heart rate, Blood Pulse oxygen  
 SCBA tank with transmit cap

Units on the scene

12/02/2015 PMT701 VIDEO ANALYTICS G LEHMAN PROF MCCRIE

*\* Please note that the below descriptions of RFES's ESF Responsibilities and Functions is the author's understanding only, and may not be completely accurate in every respect and may be variously flawed; these impressions were gained during the onsite interview and literature/website review, and the author accepts full responsibility for all errors which may arise for any number of reasons. \**

#### **Appendix Five**

*Emergency Support Function #4 Firefighting* responsibilities for RFES include but are not limited to:

- Fire prevention and suppression
- Emergency medical treatment
- Hazardous materials incident response and training
- Radiological monitoring and decontamination
- Assist with evacuation
- Search and rescue
- Temporary shelter for evacuees at each fire station
- Assist in initial warning and alerting
- Provide qualified representative to assist in the local EOC
- Requests assistance from supporting agencies when needed
- Arranges direct liaison with fire chiefs in the area
- Implements mutual aid

#### **Appendix Six**

*Emergency Support Function #10 Oil and Hazardous Materials* responsibilities for RFES include but are not limited to:

- Develop and maintain the Hazardous Materials Emergency Response Annex
- Develop procedures aimed at minimizing the impact of an unplanned release of a hazardous material to protect life and property
- Conduct training for personnel in hazardous materials response and mitigation
- Follow established procedures in responding to hazardous materials incidents
- Provide technical information
- Coordinate control/mitigation efforts with other local, state, and federal agencies
- Record expenses

*Emergency Support Function #14 Long-Term Community Recovery* responsibilities include but are not limited to:

- Convene interagency recovery expertise to provide strategic guidance to long-term recovery efforts
- Identify/address long-term recovery issues, including those fall between existing mandates of agencies
- Avoid duplication of assistance, coordinate program application processes and planning requirements to streamline assistance processes, and identify and coordinate resolution of policy and program issues.
- Identify programs and activities across the public, private, and nonprofit sectors that similarly support long-term recovery and promote coordination between them
- Identify appropriate Federal programs and agencies to support implementation of comprehensive long-term community planning and identify gaps in available resources

## Appendix Seven

*Emergency Support Function #5 involves Emergency Management. This ESF involves coordination responsibilities and communications, internal and external and multi-agency.* The Emergency Management ESF seeks to coordinate and facilitate collaboration between the different departments, agencies and groups which are involved with disaster and emergency situations. The National Incident Management System will provide the template for RFES emergency management actions. RFES will collaborate with the other teams responsible for other ESF's.

ESF #5 is primarily concerned with disaster/emergency *response*. Recovery is not a RFES primary focus area although outputs from #5 can inform recovery operations once the crisis is stabilized and transitioning to the recovery phase is in process.

One of the primary functions under ESF#5 is scribing events, documenting parties responsible, outcomes and timelines of events/responses to these situations. This type of information is crucial in the ESF#5-directed Post Incident Review. Budgeting is not a formal part of ESF#5 per se, however expense accounting/logging is an important ESF#5 function for RFES.

ESF#5 is significantly involved in the mitigation and preparation/planning disciplines of emergency management. In meeting this responsibility, RFES has developed an extensive inventory of classes, teaches nationally-recognized fire training and hazardous materials clean up and management education modules, and conducts multiple training exercises including tabletop exercises as well as all the way up to full-field asset exercises.

ESF#5 directs that the responsible department establishes, maintains, staffs and operates an Emergency Operations Center. The EOC at the FTC is extensively discussed above. The EOC is the focal point for all agencies and departments locally and in concert as appropriate with neighboring counties and with state-level officials and the NY Department of Homeland Security and Emergency Services in all-hazards disasters/emergencies.

RFES also (in compliance with ESF#5 responsibilities) will collaborate in assessment and recommendations regarding requirements and scoping of mass casualty treatments, mass sheltering requirements; and also will (as part of preparation) conduct community outreach as described above, which involves disaster distribution procedures and dissemination of important public safety information; as well as maintaining a database of persons at risk and vulnerable populations in Rockland County.

RFES serves as the emergency response community's information distribution focal point so that all departments and functions have a consistent source of verified information. This helps control the 'rumor mill' and helps keep efforts and focus where it needs to be. ESF#5 also encompasses the role of evacuation planning and implementation in an emergency.

As part of ESF#5, RFES maintains and operates the county's GIS capability, which is used across virtually all ESF functions as well as across each emergency management discipline.

**ESF#5 Operational Environment:** RFES will monitor events as they develop and engage resources commensurate with circumstances. If initially-involved assets or resources are insufficient, RFES will draw in more response resources. In serious situations requiring, RFES will dispatch a field observer to

the site with the mission of interfacing directly with the EOC which relieves the onsite personnel to concentrate on direct disaster response. RFES staff will apprise Director of Fire and Emergency Services of the status on prearranged timeframes to keep a constant and direct flow of situational awareness as up to date as practicable. RFES’s ESF#5 responsibilities also include establishing informational status updates at pre-arranged schedules at time intervals to be determined *in situ*. ESF#5 directs that RFES staff collects, analyzes, summarizes, prepares and distributes timely status updates for general distribution throughout the emergency response community. RFES is directed to maintain the EOC operational with completion of all duties until such time as the disaster is declared terminated.

**Appendix Eight**



**Emergency Operations Center**

located in basement of:

Rockland County Fire Training Center  
 35 Firemen's Memorial Drive  
 Pomona, NY 10970

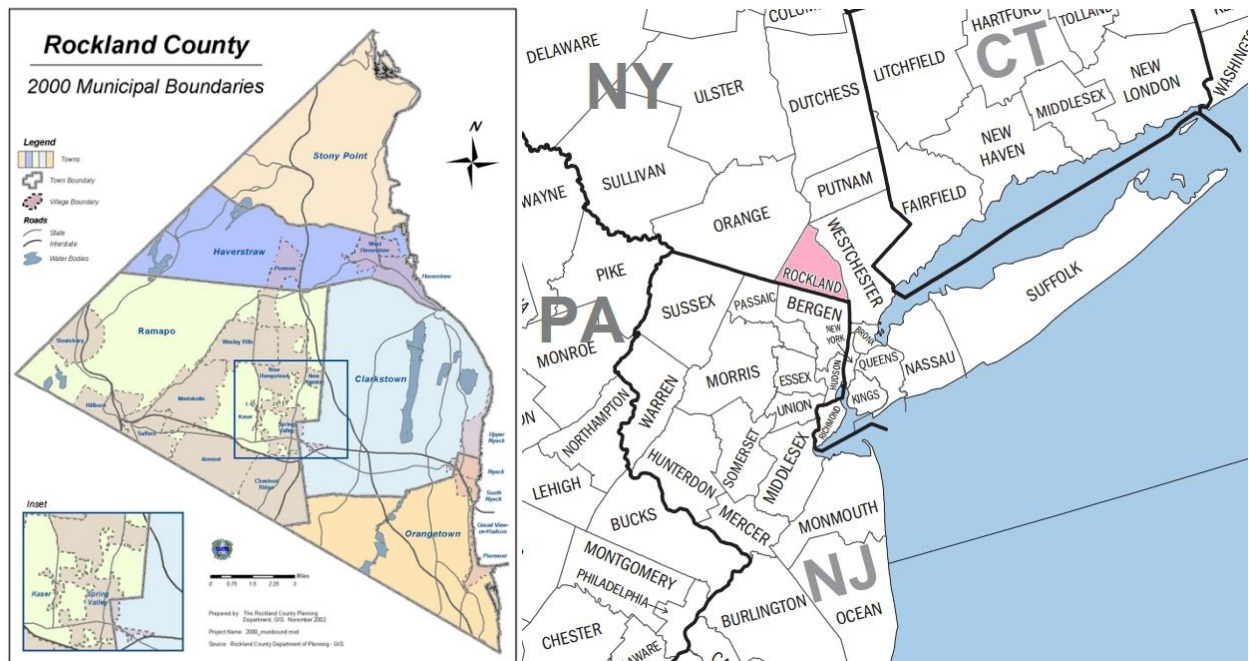


Partial List of collaborating agencies/departments (list will change with nature of disaster):

Public Information Center	Dept Environmental Conservation	Purchasing Department
Coast Guard	NYS Department of Health	FBI
Sheriff’s Office	Suez (Water Utility)	Rockland Parks Dept
Orange and Rockland Utility	Entergy (Indian Point Impact)	Rockland – Red Cross
Rockland Independent Living Center	NYS Div. Homeland Security / Emergency Management	Department of Mental Health
NY State Policy	Board of Cooperative Education Services, representing ALL K-12	Rockland Office of the Aging
NY Park Police	NYS Dept of Transportation	County Engineering

Emergency Medical Services	Rockland Highway Dept	County Executive Office
CSX Rail Transportation	Verizon Telecommunications	Nyack Water Company

## Appendix Nine



## Appendix Ten

The Rockland Local Emergency Planning Committee is the collaboration and relationship-building process between citizen, public sector and private sector. Citizens and the private sector are going to be the first informers for chemical and hazmat and are in best position to provide guidance for local government as to the risks of the hazmat and chemicals in their own neighborhoods and industrial areas. The LPEC includes the following participants, and more are eligible to become part of the Committee:

- State and local elected officials
- Emergency managers in RFES
- Fire Department representation and law enforcement
- Public health representatives
- Rockland County hospitals and emergency departments
- Environmental Protections Agency
- Red Cross
- Private sector representatives
- Local community groups and representatives


- Schools, Board of Cooperative Education Services
- Media and transportation companies, and others as indicated

### Appendix Eleven

PRIORITIZATION OF ACTIONS

Final Plan - October 2010

Base of Jurisdiction: Village of Haverstraw



Action	** = cost (unfavorable)							*0 = neutral or not applicable			** = benefit (favorable)			High, medium, or low		
	S	T	A	P	L	E	E	Can be implemented easily	Achieves multiple objectives	Can be implemented quickly	Overall Benefit	Overall Costs	Priority			
Review and update floodplain management ordinance.	+	+	+	+	+	+	+	+	+	+	High	Low	High			
Bank stabilization and dewatering of Micokeog Creek.	+	+	+	+	-	-	-	-	+	-	High	High	Low			
Shoring Protection armoring of bank of Bosteen Pond - end of Warren Avenue.	+	+	+	+	-	-	-	-	+	-	High	High	Low			
Hillside Drainage Improvement	+	+	+	+	+	+	+	+	+	+	High	Low	High			

Municipal STAPLEES - unchanged from July 2009

PA

-2-

This is an actual FEMA “STAPLEE” Prioritization sheet. Notice that the benefits of all four items is ‘high’. Haverstraw is a riverside community on the shores of the Hudson bounded by steep cliffs to the west and the river to the east... and as such, the action items of reviewing and updating the floodplain ordinances and implementing hillside drainage improvements received a high priority, perhaps in particular because the cost was low (and the cost of the other two was ‘high’). Hence, the benefit/cost was highest for the first and fourth items on this FEMA worksheet, and these two items beat the other two items (deemed high cost).



## Appendix Twelve

FEMA Plan - October 2010

Municipal Implementation Strategy - Unchanged from July 2008

### IMPLEMENTATION STRATEGY WORKSHEET

(Name of Jurisdiction) **TOWN OF HAVERSTRAW**



Before completing this form, your jurisdiction should already have considered the full range of possible mitigation actions set forth in the Risk Assessment Interim Deliverable, selected a subset of the actions that your jurisdiction would like to implement, AND filled out the "Prioritization Worksheet". Now, on this page, transfer from the "Prioritization Worksheet" each action and its priority rank, then fill in the remainder of the row.

PRIORITY	Mitigation Action	Please list the hazards that the action will address.	Please say whether the action will affect existing assets, future assets, or both?	What municipal department will take the lead on moving forward with the project?	What is the existing authority or local planning mechanism through which the action can be implemented?	What is the target date for project completion?	What is the estimated cost of the project? (order of magnitude dollars, or qualitative amount(s))	What funding source do you anticipate? (i.e., local staff time, local budget, grant funding, etc.)
V	Storm Surge Build Jetties Stabilize Shoreline	Shore Line Erosion	Both	Parks Dept.	N/A	less than 5 years	200K	Grant
N	Storm Surge Dredge Minecoongo Stream Stabilize Banks	Damage to Sewer Plant & flooding of road	Both	Highway Dept	N/A	Less than 5 Years	500K- 1Mil	Grant
N	Stabilize banks and prevent flooding along Minecoongo	Damage to Municipal and Private Property	Both	Highway Dept	N/A	More than 5 years	10 Mil	Grant
H	DPW Bridge & Access road	DPW, Golf Parks Depto	Both	Highway Dept	N/A	Less than 5 Years	400K	Grant
H	Drill well(s) and install Storage/Pump system	Drought Loss of Tees & Greens on Hunt Golf course	Both	Golf Dept	N/A	Less than 5 Years	300K	Grant

*\*\* Priority to be carried over from the STABLE worksheet*

*VRB/d@msg 6/18 ✓ LI*

This is an actual Haverstraw Implementation Strategy Worksheet. The workflow between the Priority Worksheets and this Implementation Strategy Worksheet are explained in detail in the FEMA workshop booklets, among them "Developing The Mitigation Plan" (FEMA Plan, 2003)