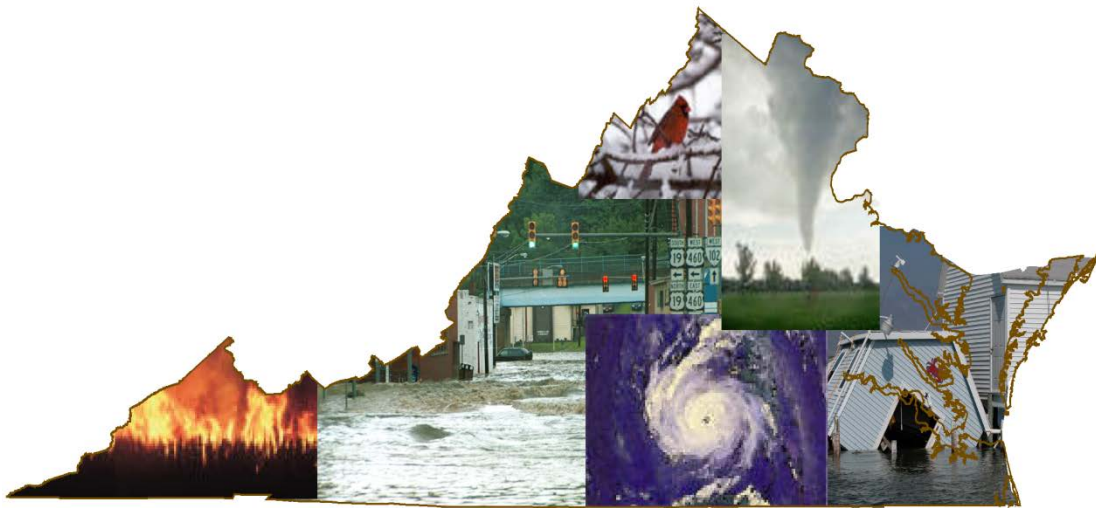


# COMMONWEALTH OF VIRGINIA



## Hazard Mitigation Plan



### Chapter 5 Mitigation Strategy



### Disaster Mitigation Act of 2000

*§201.4(c)(ii): The State mitigation strategy shall include a] description of State goals to guide the selection of activities to mitigate and reduce potential losses.*

*§201.4(c)(3)(iii): An identification, evaluation, and prioritization of cost-effective, environmentally sound, and technically feasible mitigation actions and activities the State is considering and an explanation of how each activity contributes to the overall mitigation strategy. This section should be linked to local plans, where specific local actions and projects are identified.*

*§201.4(c)(3)(iii): The State mitigation strategy shall include an] identification of current and potential sources of Federal, State, local, or private funding to implement mitigation activities.*

*§201.4(d): Review and updates. Plan must be reviewed and revised to reflect changes in development, progress in statewide mitigation efforts, and changes in priorities and resubmitted for approval to the appropriate Regional Director every three years. The Regional review will be completed within 45 days after receipt from the State, whenever possible. We also encourage a State to review its plan in the post-disaster time frame to reflect changing priorities, but it is required.*

## 5.1 2013 Plan Update

Early on in the planning process the primary focus was to tie the Mitigation Strategy directly to the results of the HIRA (Chapter 3). The Mitigation Strategy is a critical part of the process, as it identifies and prioritizes proposed actions to reduce future risk to natural hazards. Section 3.16 of the HIRA identifies flooding as the most frequent and costly hazard in terms of loss of life and property in Virginia. There is no coincidence that the Mitigation Strategy is targeted at reducing impacts of flooding.

The Commonwealth of Virginia Hazard Mitigation Plan is structured with a traditional hierarchy that begins with a Mitigation Vision supported by four major goals. The four major goals are supported by categories, and the categories are supported by mitigation actions, each of which contribute to reducing risk in the Commonwealth and support the Mitigation Vision.

### **VISION:**

**It is the Commonwealth’s vision to promote resiliency and reduce the long term impacts of hazards on human, economic, and natural resources throughout the state.**





## 5.2 Virginia Mitigation Goals

During the planning process, the mitigation vision and goals received minor modifications that were reviewed and approved by the Virginia Hazard Mitigation Advisory Committee (VHMAC). The four goals are as follows:

### **Goal #1**

Identify and implement projects that will eliminate long-term risk, directly reduce impacts from hazards, and maintain continuity of critical societal functions.

### **Goal #2**

Incorporate mitigation concepts and objectives into existing and future policies, plans, regulations, and laws in the Commonwealth.

### **Goal #3**

Improve the quality of the data and analysis used in the hazard identification and risk assessment process in state, local, and university hazard mitigation plans.

### **Goal #4**

Through training, education, and outreach promote awareness of hazards, their risk, and potential mitigation actions in order to increase resiliency.

## 5.3 Virginia Mitigation Categories

To better streamline the planning process, the categories were reviewed and revised as a part of the 2013 update. The plan update utilized seven categories that were seen in many of the local hazard mitigation plans, and these categories were reviewed and approved by the VHMAC during the October 16, 2012 webinar. The categories were modified to be more specific to state level planning initiatives. The seven categories include a wide range of options to consider for mitigation actions. The categories include prevention of future risk; protection of the built environment; natural resource protection; hazard modification through construction; emergency services; public education and awareness; and risk analysis.





**1. Prevention of Future Risk**

Preventative activities are intended to keep hazard problems from getting worse, and are typically administered through government programs or regulatory actions that influence the way land is developed and buildings are built. They are particularly effective in reducing a community’s future vulnerability, especially in areas where development has not occurred or capital improvements have not been substantial. Examples of preventative activities include:

- Planning and Zoning
- Building Codes
- Open Space Preservation
- Floodplain Regulations
- Stormwater Management Regulations
- Drainage System Maintenance
- Capital Improvement Programming
- Setbacks for hazard areas
- Use of pervious surfaces

**2. Protection of the Built Environment**

Property protection measures involve the modification of existing buildings and infrastructure to help them better withstand the forces of hazard, or removal of the structures from hazardous locations:

- Acquisition and Demolition
- Acquisition and Relocation
- Structural Elevation
- Critical Facilities and Infrastructure Protection
- Retrofitting (i.e., windproofing, floodproofing, seismic design techniques, ignition resistant construction materials, etc.)
- Safe rooms, shutters, shatter-resistant glass
- Insurance
- Impervious surface modifications





**3. Natural Resource Protection**

Natural resource protection activities reduce the impact of natural hazards by preserving or restoring natural areas and their protective functions. Such areas include floodplains, wetlands, steep slopes, and sand dunes. Parks, recreation or conservation agencies and organizations often implement these protective measures. Examples include:

- Floodplain Protection
- Watershed Management
- Riparian Buffers
- Forest and Vegetation Management (e.g., fire resistant landscaping, fuel breaks, defensible space, etc.)
- Erosion and sediment control
- Wetland preservation and restoration
- Habitat preservation
- Slope stabilization

**4. Hazard Modification Through Construction**

Structural mitigation projects are intended to lessen the impact of a hazard by modifying the environmental natural progression of the hazard event through construction. They are designed by engineers and usually managed or maintained by public works staff:

- Reservoirs
- Dams/levees/dikes/floodwalls
- Diversions/detention/retention
- Channel modifications
- Storm Sewers
- Drainage Improvements
- Minor Localized Flood Reduction Project

**5. Emergency Services**

Although not typically considered a “mitigation” technique, emergency service measures do minimize the impact of a hazard event on people and property. These commonly are actions taken immediately prior to, during, or in response to a hazard event.





Examples include:

- Warning Systems
- Evacuation planning and management
- Emergency response training and exercises
- Continuity of operations planning
- Sandbagging for flood protection
- Elevating contents for flood protection
- Installing temporary shutters for wind protection
- Generator and Quick Connects

**6. Public Education and Awareness**

Public education and awareness activities are used to advise residents, elected officials, business owners, potential property buyers, and visitors about hazards, hazardous areas, and mitigation techniques they can use to protect themselves and their property. Examples of measures to educate and inform the public include:

- Outreach projects
- Speaker series/demonstration events
- Hazard map information
- Real estate disclosure
- Library materials
- School children educational programs
- Hazardous expositions

**7. Risk Analysis**

Whether it is writing a plan or implementing a bricks and mortar project, analyzing risk is the backbone for developing a project scope of work or mitigation actions. Examples of measures to analyze risk include:

- Hazard Identification and Risk Assessment
- Threat Hazard Identification and Risk Assessment
- Benefit Cost Analysis
- Probability
- Hazard History
- Dollar losses and impacts





After goals and objectives were established, the next step was to tie them to the results of the HIRA. Table 5.1 below shows the relationship between the hazards themselves, and the categories of mitigation.

Table 5.1 – Mitigation Options Matrix							
Mitigation Technique		Prevention of Future Risk	Protection of Built Environment	Natural Resource Protection	Hazard Modification Through Construction	Emergency Services	Public Education and Awareness
HIGH RISK HAZARDS	Flood	✓	✓	✓	✓	✓	✓
MEDIUM-HIGH RISK HAZARDS	Non-Rotational Wind	✓	✓	✓		✓	✓
	Severe Winter Weather	✓	✓			✓	✓
	Tornado	✓	✓			✓	✓
MEDIUM RISK HAZARDS	Wildfire	✓	✓	✓		✓	✓
	Drought	✓		✓		✓	✓
MEDIUM-LOW RISK HAZARDS	Earthquake	✓				✓	✓
	Landslide	✓		✓	✓	✓	✓
LOW RISK HAZARDS	Flooding Due to Dam Failure	✓	✓	✓	✓	✓	✓
	Karst	✓					✓

### 5.4 Strategy & Project Prioritization

During the November 7, 2012 VHM MAC meeting, the prioritization criteria was revised and discussed. The 2010 plan had nine criteria, and the 2013 plan had been narrowed down to seven. The VHM MAC also suggested the removal of numbers, as each criteria had equal weighting. Human Health and Safety was also voted to be move to the top of the prioritization list. Table 5.2 shows the prioritization criteria used for the 2013 update.





Table 5.2 Prioritization Criteria	
Criteria	Description
Human Health and Safety	Action protects human health, enhances public safety, protects vulnerable populations, or mitigates significant damage potential.
Continuity of Operations	Action protects the Commonwealth’s ability to maintain continuity of operations, communications, critical infrastructure, and emergency management functions during a disaster
Cost and Feasibility	Action is technically feasible and environmentally sound in terms of cost effectiveness, ability to be completed in a timely fashion, availability of expertise and technical support and ease of implementation
Loss Reduction and Economic Recovery	Action will reduce long term financial losses and promote rapid economic recovery
Benefits multiple agencies and organizations	Action benefits a number of groups, communities, or state agencies covering a large geographic area
Multi-Hazard Mitigation	Action mitigates damage to critical resources from more than one hazard
Focused Educational Efforts	Strategies for educational efforts will be carried out in a timely and relevant manner, messages are consistent, simple, and straightforward and in the appropriate media format, including alternative formats for people with special needs, and are directed toward people and property that are located within high hazard areas.

The ranking process for the 2013 update followed a similar method as the previous plan. Strategies were presented and broken out by hazard. Every committee member in attendance at the November 7, 2012 meeting had a ranking spreadsheet and voted. The committee members were instructed to vote based on the following score system:

- 0: Strategy met none of the criteria
- 1: Strategy met some of the criteria
- 2: Strategy met most of the criteria

The scores were then tallied and the range of scores is as follows:

- Low: 0 – 4
- Medium: 5 – 7
- High: 8 – 10







## 5.5 Mitigation Actions

This section identifies the status of mitigation actions identified in previous versions of this plan, as well as new strategies that were submitted under this revision. The action description includes the goal, category, status, priority ranking, cost estimate, expected timeline, hazard to be mitigated, and lead agency. The action also includes the new action number as well as the action number from the 2010 plan so that the viewer of this document will be able to determine what changes were made.

Mitigation actions are the blueprint to reducing long term risk to the Commonwealth. For this plan update, as reflected in Section 3.4, state owned and operated facilities located in the floodplain were contacted and provided mitigation targeting worksheets. Included in the worksheet was a link to a survey which included questions such as “Has your facility ever flooded?”, “Are there mitigation measures in place?”, “Would you consider any mitigation options to reduce flood risk?” The goal of this process is to obtain mitigation actions that directly reflect overall flood risk. Due to the timeline, this information did not warrant direct mitigation actions but any future project can be captured in action MH-23. Targeting worksheets can be found in Appendix L.

Each of the following mitigation actions contribute towards satisfying the mitigation goals, and therefore contribute to the overall Mitigation Vision. The mitigation actions are grouped by hazard with the following prefixes: Flood (FL), Multi-hazard (MH), Wildfire (WF), Landslide (L), Karst (K), Dam Failure (DF), Human-Caused (HC), and Canceled (CL).





Real Time Flood Warning System	
Mitigation Action FL-1	
2010 Mitigation Action S-2	
<p>Through collaborative efforts, identify opportunities to improve flood warning capabilities in areas of higher risk. As technology evolves, so should capabilities and methods to provide warning of imminent flood impacts.</p>	
BACKGROUND INFORMATION	
<b>Cost Benefit:</b>	The warning capabilities and potential to capture additional historical data on storm events is a direct benefit.
MITIGATION ACTION DETAILS	
<b>Hazard(s) Addressed:</b>	Flood
<b>Goal(s) Addressed:</b>	1,4
<b>Category(s) Addressed:</b>	5,6
<b>Priority (High, Medium, Low):</b>	High
<b>Estimated Cost:</b>	Not Determined
<b>Potential Funding Sources:</b>	Agency Funds
<b>Lead Agency/Responsible Department:</b>	NWS, VDEM, USGS, FEMA, local jurisdictions
<b>Implementation Schedule:</b>	As funding becomes available
<b>Current Status:</b>	<b>MODIFIED - ONGOING</b>
ADDITIONAL COMMENTS	
<p>USACE can, upon request through the Flood Plain Management Services (FPMS) Program, conduct Special Studies to include Flood Warning / Preparedness. Funding for FPMS studies are 100% Federal cost, however, study partners can provide additional funds to expand the study scope. USACE can also assist the States, local governments, and other non-Federal entities in the preparation of comprehensive plans for the development, utilization, and conservation of water and related land. Section 208 of the Water Resources Development Act of 1992 amended the WRDA of 1974 to include Native American Tribes as equivalent to a State. Funding for the PAS Program is cost-shared on a 50 percent federal-50 percent non-federal basis.</p>	





<b>Acquire and Install Additional Stream Gauges</b>	
<b>Mitigation Action FL-2</b>	
2010 Mitigation Action S-2.1	
Pursue funding to purchase and install additional stream gauges in areas of the state that currently do not have automated flood monitoring capabilities.	
<b>BACKGROUND INFORMATION</b>	
<b>Cost Benefit:</b>	The warning capabilities and potential to capture additional historical data on storm events is a direct benefit.
<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Goal(s) Addressed:</b>	1,4
<b>Category(s) Addressed:</b>	5,6
<b>Priority (High, Medium, Low):</b>	High
<b>Estimated Cost:</b>	Project and Specification Dependent
<b>Potential Funding Sources:</b>	HMGP 5% funds, Federal Funds
<b>Lead Agency/Responsible Department:</b>	VDEM, Local Governments, USGS, Silver Jackets
<b>Implementation Schedule:</b>	As Funding Becomes Available
<b>Current Status:</b>	<b>Ongoing</b>
<b>ADDITIONAL COMMENTS</b>	
In addition, USACE, authorized under Section 22 of the Water Resources Development Act of 1974 (Public Law 93-251), as amended, assisted by agency and local partners, is conducting a study on the Rappahannock River to identify potential locations for additional gauges. A similar study was conducted on the Chowan River Basin and resulted in the identification of six new stream gauges locations and recommended the upgrade of four rain gauges.	





Reduce Impact of Flooding on Virginia Tech Campus	
<b>Mitigation Action FL-3</b>	
2010 Mitigation Action S-3	
<p>Coordinate with adjacent locality to evaluate and improve upstream storm water management practices. Evaluate and expand size of underground stream diversion piping system to improve storm water capacity and reduce surface flows. Project would reduce flooding risks for repetitive loss buildings located on a 100-year floodplain and additional structures located on a 500-year floodplain. This project supports the university’s sheltering initiative.</p>	
BACKGROUND INFORMATION	
<b>Cost Benefit:</b>	The warning capabilities and potential to capture additional historical data on storm events is a direct benefit.
MITIGATION ACTION DETAILS	
<b>Hazard(s) Addressed:</b>	Flood
<b>Goal(s) Addressed:</b>	1
<b>Category(s) Addressed:</b>	2,3,5,6
<b>Priority (High, Medium, Low):</b>	High
<b>Estimated Cost:</b>	Undetermined
<b>Potential Funding Sources:</b>	HMGP, FEMA Public Assistance
<b>Lead Agency/Responsible Department:</b>	Virginia Tech
<b>Implementation Schedule:</b>	As funding becomes available
<b>Current Status:</b>	<b>NOT STARTED</b>
ADDITIONAL COMMENTS	
<p>VDEM and VT are discussing potential for HMGP application.</p>	





<b>TIDEWATCH Program</b>	
<b>Mitigation Action FL-4</b>	
2010 Mitigation Action S-4	
<p>TIDEWATCH presently collects water level observations at Jamestown (James River N. Ferry Pier) and Hampton/Poquoson (Back River) using VIMS-owned microwave radar sensors with GOES radio transmission to a server at VIMS at half-hour intervals. Six-minute water levels referenced to NOAA tidal datums (HAT,MHHW,MSL,MLLW,LAT) are displayed along with data from six active NOAA stations in lower Chesapeake Bay at <a href="http://www.vims.edu/tidewatch">www.vims.edu/tidewatch</a>. Processed data stored in VIMS data base archives are also referenced to NGVD29 and NAVD88. A 24-hour operational forecast component for TIDEWATCH is presently under development with funding provided by NOAA/NWS. Funds are needed to maintain operation and add one new station to TIDEWATCH.</p>	
<b>BACKGROUND INFORMATION</b>	
<b>Cost Benefit:</b>	The warning capabilities and potential to capture additional historical data on storm events is a direct benefit.
<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Goal(s) Addressed:</b>	1,3,4
<b>Category(s) Addressed:</b>	5,6,7
<b>Priority (High, Medium, Low):</b>	High
<b>Estimated Cost:</b>	Undetermined
<b>Potential Funding Sources:</b>	Agency Funds, HMGP 5%
<b>Lead Agency/Responsible Department:</b>	VIMS
<b>Implementation Schedule:</b>	As funding becomes available
<b>Current Status:</b>	<b>ONGOING</b>
<b>ADDITIONAL COMMENTS</b>	
<p>Funding is needed to install additional tide gauges.</p>	





<b>Acquisition and Demolition of Flood Prone Properties</b>	
<b>Mitigation Action FL-5</b>	
2010 Mitigation Action S-18	
<p>Assist localities, state agencies, PDCs, and eligible PNP's to identify vulnerable structures and apply for funding to implement acquisition and demolition projects. Acquisition and demolition projects completely remove the structure from the floodplain, reducing any future damages. The property is then deed restricted to be open space in perpetuity. This insures that no structure can be built on the parcel of land that could sustain future damages and possible insurance claims against the NFIP. Repetitive Loss and Severe Repetitive Loss properties are targeted for this project type.</p>	
<b>BACKGROUND INFORMATION</b>	
<b>Cost Benefit:</b>	The acquisition and demolition of flood prone properties are typically cost effective, depending on the first floor elevation, history of flooding and fair market value of the structure.
<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Goal(s) Addressed:</b>	1
<b>Category(s) Addressed:</b>	2,3
<b>Priority (High, Medium, Low):</b>	High
<b>Estimated Cost:</b>	Dependant on Value of Property
<b>Potential Funding Sources:</b>	HMA Programs
<b>Lead Agency/Responsible Department:</b>	VDEM
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>New Action - Ongoing</b>
<b>ADDITIONAL COMMENTS</b>	
<p>VDEM and local communities across the Commonwealth have successfully acquired and demolished over 400 flood prone properties. This project type is completely voluntary, and requires written voluntary participation agreements from property owners. Individual property owners cannot apply directly to FEMA, they are required to work through their community or other eligible entity as a sponsor.</p>	





<b>Acquisition and Relocation of Flood Prone Properties</b>	
<b>Mitigation Action FL-6</b>	
2010 Mitigation Action S-18	
<p>Assist localities, state agencies, PDCs, and eligible PNP's to identify vulnerable structures and apply for funding to implement acquisition and relocation projects. Acquisition and relocation projects completely remove the structure from the floodplain, reducing future damages. The parcel of land is acquired, and the structure is physically moved to another parcel located outside of the floodplain. The remaining parcel of land in the floodplain is deed restricted to be open space in perpetuity. This insures that no structure can be built on the parcel of land that could sustain future damages and possible insurance claims against the NFIP. Repetitive Loss and Severe Repetitive Loss properties are targeted for this project type.</p>	
<b>BACKGROUND INFORMATION</b>	
<b>Cost Benefit:</b>	Cost effectiveness is project dependent; however multiple properties can be included together for an aggregate benefit cost ratio.
<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Goal(s) Addressed:</b>	1
<b>Category(s) Addressed:</b>	2,3
<b>Priority (High, Medium, Low):</b>	High
<b>Estimated Cost:</b>	Project Dependent
<b>Potential Funding Sources:</b>	HMA Funds, USACE
<b>Lead Agency/Responsible Department:</b>	VDEM
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>New Action - Ongoing</b>
<b>ADDITIONAL COMMENTS</b>	
<p>Acquisition and Relocation projects were very successful in reducing risk in the Central Shenandoah Valley, particularly Glasgow after Hurricane Fran in 1996. This project type is completely voluntary, and requires written voluntary participation agreements from property owners. Individual property owners cannot apply directly to FEMA, they are required to work through their community or other eligible entity as a sponsor.</p>	





<b>Floodproofing of Public, Commercial, and Historical Buildings</b>	
<b>Mitigation Action FL-7</b>	
2010 Mitigation Action S-18	
<p>Assist localities, state agencies, PDCs, and eligible PNP’s to identify vulnerable structures and apply for funding to implement floodproofing projects. Floodproofing is a more viable option for businesses, public buildings, and historical buildings. Floodproofing typically involves keeping the water from entering the structure, either by direct access or through seepage. This is usually accomplished by installing permanent and/or removable barriers at openings such as doors or full pane windows. It may be necessary to also apply a sealant around the structure to prevent water from seeping in. Repetitive Loss and Severe Repetitive Loss properties are targeted for this project type.</p>	
<b>BACKGROUND INFORMATION</b>	
<b>Cost Benefit:</b>	Floodproofing may be less costly than acquisition or elevation, and if feasible provides protection to up to a 100 year event in most cases.
<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Goal(s) Addressed:</b>	1
<b>Category(s) Addressed:</b>	2,3
<b>Priority (High, Medium, Low):</b>	High
<b>Estimated Cost:</b>	Project Dependent
<b>Potential Funding Sources:</b>	HMA Funds, USACE
<b>Lead Agency/Responsible Department:</b>	VDEM
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>New Action - Ongoing</b>
<b>ADDITIONAL COMMENTS</b>	
<p>Floodproofing projects have been implemented for businesses in the cities of Salem and Staunton. Another project is currently being considered in Norfolk, VA. This project type is completely voluntary, and requires written voluntary participation agreements from property owners. Individual property owners cannot apply directly to FEMA, they are required to work through their community or other eligible entity as a sponsor.</p>	







Mitigation Reconstruction of Severe Repetitive Loss Properties	
Mitigation Action FL-8	
2010 Mitigation Action S-30	
<p>Assist localities and PDCS to identify severe repetitive loss (SRL) properties and apply for funding to implement mitigation reconstruction projects. Mitigation reconstruction result in the demolition of the existing structure, and the construction of a code-compliant and hazard resistant structure on an elevated foundation system. Eligible costs are limited to \$150,000 federal share per property. Only properties identified by the National Flood Insurance Program as SRL are eligible for mitigation reconstruction through the SRL grant program.</p>	
BACKGROUND INFORMATION	
<b>Cost Benefit:</b>	Cost effectiveness is project dependent; however multiple properties can be included together for an aggregate benefit cost ratio.
MITIGATION ACTION DETAILS	
<b>Hazard(s) Addressed:</b>	Flood
<b>Goal(s) Addressed:</b>	1
<b>Category(s) Addressed:</b>	2,3
<b>Priority (High, Medium, Low):</b>	Medium
<b>Estimated Cost:</b>	Project Dependent
<b>Potential Funding Sources:</b>	SRL Funds
<b>Lead Agency/Responsible Department:</b>	VDEM
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>Ongoing</b>
ADDITIONAL COMMENTS	
<p>VDEM recently assisted the Town of Chincoteague and Northumberland County in applying for the first mitigation reconstruction projects in the state through the SRL program. The property in Chincoteague has been completed. This project type is completely voluntary, and requires written voluntary participation agreements from property owners. Individual property owners cannot apply directly to FEMA, they are required to work through their community or other eligible entity as a sponsor.</p>	





Minor Localized Flood Reduction Projects	
<b>Mitigation Action FL-9</b>	
2010 Mitigation Action S-18	
Assist localities and PDCS to identify vulnerable structures and infrastructure and apply for funding to implement minor localized flood reduction projects. These projects are designed to lessen the frequency or severity of flooding and decrease predicted flood damages, such as the installation or modification of culverts and stormwater management activities such as creating retention and detention basins.	
<b>BACKGROUND INFORMATION</b>	
<b>Cost Benefit:</b>	Cost benefit is project dependent. If proposed solution protects structures, roads, and utilities it is more likely to be cost effective.
<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Goal(s) Addressed:</b>	1
<b>Category(s) Addressed:</b>	2,3,4
<b>Priority (High, Medium, Low):</b>	High
<b>Estimated Cost:</b>	Project Dependent
<b>Potential Funding Sources:</b>	HMA Funds
<b>Lead Agency/Responsible Department:</b>	VDEM
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>New Action - Ongoing</b>
<b>ADDITIONAL COMMENTS</b>	
VDEM has assisted Hanover County, Henry County, and the Town of Abingdon apply for and implement drainage improvement projects to reduce flooding.	





Elevation of Flood Prone Properties	
<b>Mitigation Action FL-10</b>	
2010 Mitigation Action S-18	
<p>Assist localities, state agencies, PDCs, and eligible PNP’s to identifying vulnerable properties and apply for funding to implement elevation projects. Elevations involve the physical raising of a structure to base flood elevation (BFE) or higher if required in local floodplain ordinances. Structure elevation may be achieved through a variety of methods, including elevating on continuous foundation walls; elevating on open foundations, such as piles, piers, posts, or columns; and elevating on fill. Foundations will require designs to properly address all loads and be appropriately connected to the floor structure above, and utilities are required to be properly elevated as well. Repetitive Loss and Severe Repetitive Loss properties are targeted for this project type.</p>	
<b>BACKGROUND INFORMATION</b>	
<b>Cost Benefit:</b>	Cost effectiveness is project dependent; however multiple properties can be included together for an aggregate benefit cost ratio.
<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Goal(s) Addressed:</b>	1
<b>Category(s) Addressed:</b>	2,3
<b>Priority (High, Medium, Low):</b>	High
<b>Estimated Cost:</b>	Project Dependent
<b>Potential Funding Sources:</b>	HMA Funds, USACE
<b>Lead Agency/Responsible Department:</b>	VDEM
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>New Action - Ongoing</b>
<b>ADDITIONAL COMMENTS</b>	
<p>VDEM and local communities across the Commonwealth have successfully elevated over 270 flood prone properties. This project type is completely voluntary, and requires written voluntary participation agreements from property owners. Individual property owners cannot apply directly to FEMA, they are required to work through their community or other eligible entity as a sponsor.</p>	





Integrate Mitigation Of Repetitive Loss Structures into Local Hazard Mitigation Plans	
<b>Mitigation Action FL-11</b>	
2010 Mitigation Actions P-1 & P-2	
Integrate repetitive loss list and severe repetitive loss list structural targeting into local, regional and state mitigation planning and grant implementation property targeting.	
<b>BACKGROUND INFORMATION</b>	
<b>Cost Benefit:</b>	Not Determined
<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Goal(s) Addressed:</b>	2
<b>Category(s) Addressed:</b>	1,5,6
<b>Priority (High, Medium, Low):</b>	High
<b>Estimated Cost:</b>	Not Determined
<b>Potential Funding Sources:</b>	HMA Funds
<b>Lead Agency/Responsible Department:</b>	VDEM
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>Modified - Ongoing</b>
<b>ADDITIONAL COMMENTS</b>	
Each local hazard mitigation plan is required by VDEM to identify the types and numbers of repetitive loss properties for each jurisdiction.	





<b>Identification of Repetitive Loss Properties with Non-Specific Addresses</b>	
<b>Mitigation Action FL-12</b>	
2010 Mitigation Action P-1.1	
<p>During the process of identifying repetitive loss properties that were mitigated using Federal HMA funds it was discovered that over 550 of the more than 6,000 addresses provided by the NFIP Repetitive Loss list were very vague and descriptive rather than specific. This vagueness creates flawed data for comparison of HMA funded structural mitigation activities.</p>	
<b>BACKGROUND INFORMATION</b>	
<b>Cost Benefit:</b>	Will provide better targeting for reducing repetitive loss.
<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Goal(s) Addressed:</b>	2,3,4
<b>Category(s) Addressed:</b>	1,6,7
<b>Priority (High, Medium, Low):</b>	High
<b>Estimated Cost:</b>	Not determined
<b>Potential Funding Sources:</b>	Hazard Mitigation Assistance Funds, FEMA Technical Assistance
<b>Lead Agency/Responsible Department:</b>	VDEM, FEMA, Local Governments, USACE
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>Modified - Ongoing</b>
<b>ADDITIONAL COMMENTS</b>	
<p>An initial report of mitigation repetitive loss properties was submitted to FEMA in June of 2011, which included mitigation properties and AW501 forms for 52 properties. As more projects are completed and closed, additional AW501 forms will be provide to FEMA to remove the property from the list. Since this process is already established, quarterly reports to FEMA should not be needed as the properties will be removed from the list as they are mitigated. Through FEMA technical assistance, VDEM and FEMA have identified the locations of over 200 inaccurate addresses as a result of a technical assistance request after Hurricane Irene (DR 4024). In addition, VDEM has required local hazard mitigation plans to include a repetitive loss strategy to identify addresses that are inaccurate in the repetitive loss list. The repetitive loss strategy requirement in local hazard mitigation plans also addresses verification of location of properties.</p>	





<b>Identification of Repetitive Loss Properties that Have been Mitigated by Means other than HMA Funds</b>	
<b>Mitigation Action FL-13</b>	
2010 Mitigation Action P-1.2 & H-11	
<p>During the discussion of identifying repetitive loss properties that were mitigated using Federal HMA funds VDEM was questioned by FEMA Region III as to what properties on the Repetitive Loss list had been mitigated by other than HMA funding. It was suggested that the Commonwealth cross-reference the properties that had received Increased Cost of Compliance (ICC) funding to provide this information to the NFIP. The issue associated with this is three-fold: first, the descriptive address issue as discussed in <b>FL-12</b> directly affects the complete documentation of mitigated properties; second, the Commonwealth is not willing to either make the assumption that all ICC funds were appropriately used in accordance to all federal guidelines when the Commonwealth is not associated with the mitigation activity; third, it presumes that the localities have readily accessible and accurate documentation associated with all aspects of the usage of the ICC funds by the property owner. Further, there is no local-to-State reporting mechanism currently in place to identify these properties. .</p>	
<b>BACKGROUND INFORMATION</b>	
<b>Cost Benefit:</b>	Not Determined
<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Goal(s) Addressed:</b>	2,3,4
<b>Category(s) Addressed:</b>	1,6,7
<b>Priority (High, Medium, Low):</b>	Medium
<b>Estimated Cost:</b>	Not Determined
<b>Potential Funding Sources:</b>	Agency Funds
<b>Lead Agency/Responsible Department:</b>	VDEM, FEMA, Local Governments
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>Modified - Ongoing</b>
<b>ADDITIONAL COMMENTS</b>	
<p>Each local hazard mitigation plan that comes through VDEM for approval must have a mitigation strategy to address repetitive loss properties, including properties that have been mitigation by means other than HMA funds. This strategy will ensure that future repetitive loss lists will be reviewed by the local communities to determine if mitigated and if so by what means? Due to 7 presidential disaster declarations over the past three years, an annual and quarterly report on non-HMA mitigation properties has not been developed.</p>	





Real Time Flood Inundation Program	
Mitigation Action FL-14	
2010 Mitigation Action H-4	
Determine usefulness of existing data being calculated through stream, rain, and water quality gages and develop a method to improve and coordinate data sources into a real time flood mapping system.	
BACKGROUND INFORMATION	
<b>Cost Benefit:</b>	Not Determined
MITIGATION ACTION DETAILS	
<b>Hazard(s) Addressed:</b>	Flood
<b>Goal(s) Addressed:</b>	3
<b>Category(s) Addressed:</b>	5,6,7
<b>Priority (High, Medium, Low):</b>	High
<b>Estimated Cost:</b>	Not Determined
<b>Potential Funding Sources:</b>	Federal Funds
<b>Lead Agency/Responsible Department:</b>	FEMA, USGS, VDEM, NWS, USACE, Silver Jackets
<b>Implementation Schedule:</b>	As Funding Becomes Available
<b>Current Status:</b>	<b>Modified- Not Started</b>
ADDITIONAL COMMENTS	
This is very dependent on funding, but is still a relevant and viable project.	
The Silver Jackets Team has developed a draft scope of work to create inundation mapping for the Blackwater River in the vicinity of the City of Franklin. The scope of work will be submitted in FY13 for consideration. Project will be contingent on project selection and availability of funds.	





Incorporate Updated Flood Frequency Data into Updated DFIRMs	
Mitigation Action FL-15	
2010 Mitigation Action H-5	
Work with FEMA and USGS to establish a process for incorporating updated flood frequency data into updated DFIRMs as a part of the Risk Map efforts. USGS flood frequency data is typically updated on a 15 year basis.	
BACKGROUND INFORMATION	
<b>Cost Benefit:</b>	Not Determined
MITIGATION ACTION DETAILS	
<b>Hazard(s) Addressed:</b>	Flood
<b>Goal(s) Addressed:</b>	3
<b>Category(s) Addressed:</b>	1,6,7
<b>Priority (High, Medium, Low):</b>	High
<b>Estimated Cost:</b>	Not Determined
<b>Potential Funding Sources:</b>	Federal Funds
<b>Lead Agency/Responsible Department:</b>	FEMA, DCR
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>Modified - Ongoing</b>
ADDITIONAL COMMENTS	
Flood frequency data was not included in the majority of DFIRMs across the state, but is being included in FEMA's RiskMap products that will becoming available in draft form beginning Spring 2013.	







<b>Hazard Evaluation of Critical and State-Owned Facilities in Coastal Areas</b>	
<b>Mitigation Action FL-16</b>	
2010 Mitigation Action H-18	
<p>Flooding is Virginia’s most significant hazard. Coastal Virginia is experiencing increased risk due to sea-level rise (up to 2.3 feet over the past 100 years). State-owned and critical facilities adjacent to shorelines or in low-lying areas may be at greater risk today than they were at the time of construction. A detailed evaluation of ground stability and susceptibility to modern storm tides (storm surge plus highest astronomical tides) will identify facilities in need of mitigation or relocation. Project to be conducted in partnership with Virginia Institute of Marine Science, Shoreline Studies Program.</p>	
<b>BACKGROUND INFORMATION</b>	
<b>Cost Benefit:</b>	Not Determined
<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Goal(s) Addressed:</b>	3,4
<b>Category(s) Addressed:</b>	1,6,7
<b>Priority (High, Medium, Low):</b>	Medium
<b>Estimated Cost:</b>	\$360,000
<b>Potential Funding Sources:</b>	Not Determined, possibly 5% HMGP
<b>Lead Agency/Responsible Department:</b>	DMME
<b>Implementation Schedule:</b>	Short Term
<b>Current Status:</b>	<b>Not Started</b>
<b>ADDITIONAL COMMENTS</b>	
<p>DMME continues to seek funding to support this project.</p>	





<b>Encourage NFIP Participation</b>	
<b>Mitigation Action FL-17</b>	
2010 Mitigation Action O-8	
Develop and implement an education program for PDCs, localities, private non-profits, and citizens regarding the NFIP program and flood insurance generally.	
<b>BACKGROUND INFORMATION</b>	
<b>Cost Benefit:</b>	Increased participation in NFIP will provide flood insurance to more people in the Commonwealth.
<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Goal(s) Addressed:</b>	2,4
<b>Category(s) Addressed:</b>	6,7
<b>Priority (High, Medium, Low):</b>	Medium
<b>Estimated Cost:</b>	Not Determined
<b>Potential Funding Sources:</b>	FEMA CAP-SSSE
<b>Lead Agency/Responsible Department:</b>	DCR
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>Ongoing</b>
<b>ADDITIONAL COMMENTS</b>	
Workshops and course are offered to communities, non-profits (such as VFMA, APA, Silver Jackets, etc), and professional organizations (building officials, surveyors, zoning officials, etc.) to explain the NFIP program and flood insurance.	





<b>Promote and Implement Virginia Silver Jackets Program</b>	
<b>Mitigation Action FL-18</b>	
New Action	
Continue to participate in the Silver Jackets Program across the state. The mission of Silver Jackets is to function as a catalyst in the identification and resolution of flood hazards to support the reduction of flood risk within the Commonwealth to include such items as flood observation and warning systems, planning, flood hazard mapping, flood hazard mitigation, dams, as well as flood response and recovery activities.	
<b>BACKGROUND INFORMATION</b>	
<b>Cost Benefit:</b>	Not Determined
<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Goal(s) Addressed:</b>	1,2,3,4
<b>Category(s) Addressed:</b>	1,2,3,4,5,6,7
<b>Priority (High, Medium, Low):</b>	High
<b>Estimated Cost:</b>	Not Determined
<b>Potential Funding Sources:</b>	USACE
<b>Lead Agency/Responsible Department:</b>	DCR, VDEM, DEQ, USACE, USGS, NOAA, FEMA, NRCS
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>Ongoing</b>
<b>ADDITIONAL COMMENTS</b>	
The Virginia Silver Jackets team brings individuals from different agencies together to facilitate collaboration, share information, and leverage resources to identify and implement solutions to reduce flood hazards. In addition to the Army Corps of Engineers, the Virginia Team currently includes staff from VDEM, DEQ, Virginia DCR, NRCS, FEMA, NWS and USGS.. The Virginia Silver Jackets team brings individuals from different agencies and fields of expertise together to facilitate communication, share information, and provide 'one-stop' for local and state governments to obtain information and identify solutions to reduce flood hazards. The Virginia Silver Jackets Team first met on June 23, 2010, and officially signed a Charter on December 22, 2010.	





FEMA Risk Map Program	
Mitigation Action FL-19	
New Action	
Support FEMA in its outreach and education efforts when rolling out the Risk Map Program.	
BACKGROUND INFORMATION	
<b>Cost Benefit:</b>	Not Determined
MITIGATION ACTION DETAILS	
<b>Hazard(s) Addressed:</b>	Flood
<b>Goal(s) Addressed:</b>	2,3,4
<b>Category(s) Addressed:</b>	1,2,6,7
<b>Priority (High, Medium, Low):</b>	High
<b>Estimated Cost:</b>	Not Determined
<b>Potential Funding Sources:</b>	FEMA
<b>Lead Agency/Responsible Department:</b>	DCR, VDEM, FEMA
<b>Implementation Schedule:</b>	2-3 Years
<b>Current Status:</b>	<b>Ongoing</b>
ADDITIONAL COMMENTS	
FEMA’s Risk Map Program has 5 goals, which include addressing gaps in flood hazard data, outreach and education, hazard mitigation planning, enhanced digital platform, and alignment and synergies.	





Support Virginia Flood Risk Information System	
Mitigation Action FL-20	
New Action	
As new data on flood risk and buildings located in the floodplain become available, ensure that it is shared so that it can be incorporated into the Virginia Flood Risk Information System.	
BACKGROUND INFORMATION	
<b>Cost Benefit:</b>	Not Determined
MITIGATION ACTION DETAILS	
<b>Hazard(s) Addressed:</b>	Flood
<b>Goal(s) Addressed:</b>	1,2,3,4
<b>Category(s) Addressed:</b>	1,6,7
<b>Priority (High, Medium, Low):</b>	High
<b>Estimated Cost:</b>	Not Determined
<b>Potential Funding Sources:</b>	FEMA, USACE, FEMA, VDEM
<b>Lead Agency/Responsible Department:</b>	DCR
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>Ongoing</b>
ADDITIONAL COMMENTS	
<p>The implementation of the Virginia FRIS site will provide the following benefits:</p> <ul style="list-style-type: none"> <li>• Current flood hazard data and risk information, including available dam inundation zones, will be available to the public through an interactive website.</li> <li>• Anyone with internet access will be able to search by address, county or political area, and view the flood hazards at the site.</li> <li>• Users will be able to print a custom flood hazard map that contains the same information as a DFIRM, but allows the user to select the area that is shown within the map.</li> <li>• The site will be a source of maps and data for jurisdictional hazard mitigation plans.</li> </ul>	





<b>Encourage Participation in the Community Rating System</b>	
<b>Mitigation Action FL-21</b>	
New Action	
Encourage participation in the Community Rating System (CRS), which implements higher standards for floodplain management. Participation in the CRS program can reduce NFIP flood insurance premiums for each policy holder in a community.	
<b>BACKGROUND INFORMATION</b>	
<b>Cost Benefit:</b>	Not Determined
<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Goal(s) Addressed:</b>	4
<b>Category(s) Addressed:</b>	6
<b>Priority (High, Medium, Low):</b>	Medium
<b>Estimated Cost:</b>	Not Determined
<b>Potential Funding Sources:</b>	CAP-SSSE, Agency Funds
<b>Lead Agency/Responsible Department:</b>	DCR
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>Ongoing</b>
<b>ADDITIONAL COMMENTS</b>	
As of May 2012, there are 21 CRS communities in Virginia with savings on NFIP insurance premiums ranging from 5% to 25%. With the signing of the Biggert-Waters Flood Insurance Reform Act, the CRS program becomes more important as higher CRS ratings can help offset the increase in flood insurance premiums.	





<b>Develop Flood Mitigation Workshop for Businesses</b>	
<b>Mitigation Action FL-22</b>	
New Action	
<p>Keeping businesses open after an event is crucial to the economy and a community’s recovery process. By taking steps today, risk can be reduced for the future and install resiliency and continuity for a business. VDEM will develop a pilot mitigation workshop tailored towards businesses, and how they can take steps to reduce or eliminate their risk to losses. The goal is to work with local Chamber of Commerce, Planning District Commissions, FEMA, Virginia Silver Jackets, and the Department of Conservation and Recreation to develop a pilot workshop.</p>	
<b>BACKGROUND INFORMATION</b>	
<b>Cost Benefit:</b>	Not Determined
<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Goal(s) Addressed:</b>	4
<b>Category(s) Addressed:</b>	6
<b>Priority (High, Medium, Low):</b>	High
<b>Estimated Cost:</b>	Not Determined
<b>Potential Funding Sources:</b>	HMGP, Agency Funds, USACE
<b>Lead Agency/Responsible Department:</b>	VDEM
<b>Implementation Schedule:</b>	2 Years
<b>Current Status:</b>	<b>New Action</b>
<b>ADDITIONAL COMMENTS</b>	
<p>USACE National Nonstructural Flood Proofing Committee is available to assist with flood proofing mitigation workshop.</p>	





Continue to Encourage Communities to Increase Design Flood Elevation in Local Floodplain Ordinances	
<b>Mitigation Action FL-23</b>	
New Action	
Encourage local officials to consider increasing the level of protection required for new construction and substantial improvements in the local floodplain ordinance.	
BACKGROUND INFORMATION	
<b>Cost Benefit:</b>	By increasing the level of protection for new construction and improvements, you are reducing the potential for future loss from flooding.
MITIGATION ACTION DETAILS	
<b>Hazard(s) Addressed:</b>	Flood
<b>Goal(s) Addressed:</b>	1,2
<b>Category(s) Addressed:</b>	1,5,6,7
<b>Priority (High, Medium, Low):</b>	High
<b>Estimated Cost:</b>	Undetermined
<b>Potential Funding Sources:</b>	Community Funds, CAP-SSSE
<b>Lead Agency/Responsible Department:</b>	DCR
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>NEW-Ongoing</b>
ADDITIONAL COMMENTS	
Out of the 282 communities participating in the NFIP, 107 of them have at least a 1 foot freeboard requirement or higher. Included in that total, 4 communities have a 2 foot freeboard requirement, and 4 communities have a 3 foot freeboard requirement.	







Post Disaster Technical Assistance and Targeting	
Mitigation Action FL-24	
New Action	
Work with federal partners to provide technical assistance to local communities impacted by natural events to develop mitigation actions for targeted buildings or critical infrastructure.	
BACKGROUND INFORMATION	
<b>Cost Benefit:</b>	Not Determined
MITIGATION ACTION DETAILS	
<b>Hazard(s) Addressed:</b>	Flood
<b>Goal(s) Addressed:</b>	1
<b>Category(s) Addressed:</b>	2,3,6
<b>Priority (High, Medium, Low):</b>	High
<b>Estimated Cost:</b>	Dependent on Scope of Assistance
<b>Potential Funding Sources:</b>	FEMA HMTAP, HMGP
<b>Lead Agency/Responsible Department:</b>	VDEM, FEMA
<b>Implementation Schedule:</b>	As funding becomes available
<b>Current Status:</b>	<b>New Action - Ongoing</b>
ADDITIONAL COMMENTS	
Following Disaster 4072(June 2012 Derecho) FEMA and VDEM piloted a project to attempt to train local officials how to obtain first floor elevations for targeted repetitive loss properties in the Coastal A Zone.	





<b>Incorporate More Detailed Building Descriptive Into VAPS Reporting Requirements</b>	
<b>Mitigation Action FL-25</b>	
New Action	
The Department of Treasury’s VAPS database contains building specific information for all state owned and operated facilities. In order to improve the analysis of risk to these facilities, more detailed building information would be needed. The action involves working with the Department of Treasury’s Risk Management Division to update the fields in the VAPS reporting database.	
<b>BACKGROUND INFORMATION</b>	
<b>Cost Benefit:</b>	This will improve the ability to target at risk state facilities.
<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Goal(s) Addressed:</b>	1,4
<b>Category(s) Addressed:</b>	2,4,6,7
<b>Priority (High, Medium, Low):</b>	High
<b>Estimated Cost:</b>	Not Determined
<b>Potential Funding Sources:</b>	Agency Funds
<b>Lead Agency/Responsible Department:</b>	VDEM, VTS DRM
<b>Implementation Schedule:</b>	2-3 Years
<b>Current Status:</b>	<b>New Action</b>
<b>ADDITIONAL COMMENTS</b>	
By requiring building managers to include additional information on the buildings themselves, then more analysis can be done on future HIRAs.	





<b>Encourage Local Government Sponsorship of Grant Projects to Mitigate Repetitive Loss Properties</b>	
<b>Mitigation Action FL-26</b>	
2010 Mitigation Action O-6	
Target repetitive loss property communities with direct mailings, workshops, web-based guidance and project applications and technical support to maximize use of FEMA grant programs to mitigate targeted repetitive loss and severe repetitive loss list properties. Maximize outreach through technical workshops.	
<b>BACKGROUND INFORMATION</b>	
<b>Cost Benefit:</b>	Not Determined
<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Goal(s) Addressed:</b>	4
<b>Category(s) Addressed:</b>	6
<b>Priority (High, Medium, Low):</b>	Medium
<b>Estimated Cost:</b>	Not Determined
<b>Potential Funding Sources:</b>	Agency Funds
<b>Lead Agency/Responsible Department:</b>	VDEM
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>Ongoing</b>
<b>ADDITIONAL COMMENTS</b>	
VDEM mitigation staff has assisted local communities in developing Hazard Mitigation Assistance funds to mitigated repetitive loss and severe repetitive loss properties. Currently there are approximately \$20 million in open FEMA HMA projects in the Commonwealth.	





<h2 style="margin: 0;">Replace Cottages Southeast Virginia Training Center</h2>	
<h3 style="margin: 0;">Mitigation Action MH-1</h3>	
<p style="margin: 0;">2010 Mitigation Action S-12</p>	
<p>Replace existing cottages and program center with new buildings that meet code.</p>	
<h3 style="margin: 0;">BACKGROUND INFORMATION</h3>	
<p><b>Cost Benefit:</b></p>	<p>Not Determined</p>
<h3 style="margin: 0;">MITIGATION ACTION DETAILS</h3>	
<p><b>Hazard(s) Addressed:</b></p>	<p>All</p>
<p><b>Goal(s) Addressed:</b></p>	<p>1</p>
<p><b>Category(s) Addressed:</b></p>	<p>1,2</p>
<p><b>Priority (High, Medium, Low):</b></p>	<p>Low</p>
<p><b>Estimated Cost:</b></p>	<p>\$20,293,550</p>
<p><b>Potential Funding Sources:</b></p>	<p>Virginia Public Building Authority Bonds</p>
<p><b>Lead Agency/Responsible Department:</b></p>	<p>DBHD</p>
<p><b>Implementation Schedule:</b></p>	<p>As Funding Becomes Available</p>
<p><b>Current Status:</b></p>	<p><b>Completed</b></p>
<h3 style="margin: 0;">ADDITIONAL COMMENTS</h3>	
<p>Cottages have been completed and Occupancy Permits granted. Three have been occupied. Moves are being scheduled for the remainder. The program center is not scheduled for replacement at this time. Once complete, 119 persons will be living in new, code compliant buildings. Once completed, 21 non-code compliant cottages will be vacated and demolished.</p>	





Structural Retrofit of Existing Buildings	
Mitigation Action MH-2	
2010 Mitigation Action S-18	
<p>Assist localities, state agencies, PDCs, and eligible PNP’s to identify vulnerable structures and apply for and implement structural retrofit projects. Modifications to the structural elements of a building to reduce or eliminate the risk of future damage and to protect inhabitants. The structural elements of a building that are essential to protect in order to prevent damage include foundations, load-bearing walls, beams, columns, building envelope, structural floors and roofs, and the connections between these elements.</p>	
BACKGROUND INFORMATION	
<b>Cost Benefit:</b>	Due to the relative low probability of strong earthquakes and extreme winds in or around Virginia, the ability to demonstrate cost effectiveness for these projects is low.
MITIGATION ACTION DETAILS	
<b>Hazard(s) Addressed:</b>	Earthquake, Wind, Flood, Winter Weather
<b>Goal(s) Addressed:</b>	1
<b>Category(s) Addressed:</b>	2
<b>Priority (High, Medium, Low):</b>	Low
<b>Estimated Cost:</b>	Project Dependent
<b>Potential Funding Sources:</b>	HMA Funds
<b>Lead Agency/Responsible Department:</b>	VDEM
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>Ongoing</b>
ADDITIONAL COMMENTS	
<p>While the statewide building code addresses many of the structural requirements, older structures may not be built to current codes and require retrofits to protect against natural hazards.</p> <p>The City of Virginia Beach successfully implemented a project to retrofit fire stations with hurricane shutters to protect against wind damage. VDEM will continue to work with communities and state agencies to identify structures that may need to be retrofitted.</p>	





Non Structural Retrofit of Existing Buildings	
Mitigation Action MH-3	
2010 Mitigation Action S-18	
<p>Assist localities, state agencies, PDCs, and eligible PNP’s to identify vulnerable structures and apply for funding to implement non-structural retrofit projects. These projects involve modifications to the non-structural elements of a building or facility to reduce or eliminate the risk of future damage and to protect inhabitants. Non-structural retrofits may include bracing of building contents to prevent earthquake damage or the elevation of heating and ventilation systems.</p>	
BACKGROUND INFORMATION	
<b>Cost Benefit:</b>	<p>Depending on the cost, non-structural retrofits may be a more appropriate option due to the low probability of strong earthquakes.</p> <p>Depending on current elevation, elevating utilities above BFE may also be cost effective.</p>
MITIGATION ACTION DETAILS	
<b>Hazard(s) Addressed:</b>	Earthquake, Flood
<b>Goal(s) Addressed:</b>	1
<b>Category(s) Addressed:</b>	2
<b>Priority (High, Medium, Low):</b>	Low
<b>Estimated Cost:</b>	Project Dependent
<b>Potential Funding Sources:</b>	HMA Funds
<b>Lead Agency/Responsible Department:</b>	VDEM
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>New Action – Ongoing</b>
ADDITIONAL COMMENTS	
<p>Historically there have been some projects funded to raise utility systems above BFE. With regards to earthquake strapping, materials were provided to residents of the impacted areas of the Mineral Earthquake on steps to take to secure contents to prevent future damage. Outreach and education on non residential retrofitting will continue.</p>	





<b>Infrastructure Retrofit</b>	
<b>Mitigation Action MH-4</b>	
2010 Mitigation Action S-18	
Assist localities, state agencies, PDCs, and eligible PNP’s to identify vulnerable structures and apply for funding to implement infrastructure retrofit projects. Measures to reduce risk to existing utility systems, roads, and bridges.	
<b>BACKGROUND INFORMATION</b>	
<b>Cost Benefit:</b>	Loss of function of a utility system can produce high benefits, but these projects are all dependent on the overall cost of mitigation.
<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood, Wind, Earthquake
<b>Goal(s) Addressed:</b>	1
<b>Category(s) Addressed:</b>	2
<b>Priority (High, Medium, Low):</b>	High
<b>Estimated Cost:</b>	Project Dependent
<b>Potential Funding Sources:</b>	HMGP, PDM
<b>Lead Agency/Responsible Department:</b>	VDEM
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>New Action – Ongoing</b>
<b>ADDITIONAL COMMENTS</b>	
Many communities across the Commonwealth have applied for and received funds to mitigation infrastructure, such as generator quick connects for sewer pumping stations and shelters.	





<b>Soil Stabilization</b>	
<b>Mitigation Action MH-5</b>	
2010 Mitigation Action S-18	
<p>Assist localities, state agencies, PDCs, and eligible PNP’s to identify vulnerable structures and apply for funding to implement soil stabilization projects. These are projects to reduce risk to structures or infrastructure from erosion and landslides, including installing geo-textiles, stabilizing sod, installing vegetative buffer strips, preserving mature vegetation, decreasing slope angles, and stabilizing with rip rap and other means of slope anchoring.</p>	
<b>BACKGROUND INFORMATION</b>	
<b>Cost Benefit:</b>	There is potential to provide protection to multiple structures and utilities, which is a direct benefit.
<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood (Erosion), Landslide
<b>Goal(s) Addressed:</b>	1
<b>Category(s) Addressed:</b>	2,3,4
<b>Priority (High, Medium, Low):</b>	Low
<b>Estimated Cost:</b>	Project Dependent
<b>Potential Funding Sources:</b>	HMGP, PDM
<b>Lead Agency/Responsible Department:</b>	VDEM
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>New Action – Ongoing</b>
<b>ADDITIONAL COMMENTS</b>	
<p>Soil stabilization projects require a lot of pre-engineering to identify the problem, probability of occurrence, and proposed solution. A history of erosion or slope reduction, and rate of erosion must also be quantified.</p> <p>While VDEM has not been directly involved in any soil stabilization projects in the Commonwealth, mitigation staff continues to work with communities to identify potential projects.</p>	







<b>Post-Disaster Code Enforcement</b>	
<b>Mitigation Action MH-6</b>	
2010 Mitigation Action S-18	
<p>In limited circumstances, FEMA may fund post-disaster code enforcement projects. These projects would only be eligible under HMGP. Extraordinary needs associated with enforcing local building codes during post-disaster reconstruction may include the performance of building department functions such as building inspections, and performance of substantial damage determinations under the NFIP.</p>	
<b>BACKGROUND INFORMATION</b>	
<b>Cost Benefit:</b>	Ensuring that when re-building, that codes are being enforced to reduce future risk is extremely important in community recovery. It would be much cheaper to re-build correctly then have to retrofit later.
<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	All
<b>Goal(s) Addressed:</b>	1,2
<b>Category(s) Addressed:</b>	1
<b>Priority (High, Medium, Low):</b>	Medium
<b>Estimated Cost:</b>	Dependent on Event
<b>Potential Funding Sources:</b>	HMGP
<b>Lead Agency/Responsible Department:</b>	VDEM
<b>Implementation Schedule:</b>	Not Started
<b>Current Status:</b>	<b>New Action – Not Started</b>
<b>ADDITIONAL COMMENTS</b>	
<p>This project type would be dependent on a major disaster declaration in which there was extraordinary widespread damage which required post-disaster code enforcement.</p>	





<b>HMGP 5% Initiative Projects</b>	
<b>Mitigation Action MH-7</b>	
2010 Mitigation Action S-18	
<p>Assist localities, state agencies, PDCs, and eligible PNP's to identify needs and apply for funding to implement 5% initiative projects. These projects provide an opportunity to fund mitigation actions that are consistent with the goals and objectives of the State and local mitigation plans and meet all HMGP program requirements, but for which it may be difficult to conduct a standard BCA to prove cost effectiveness. Activities may include:</p> <ul style="list-style-type: none"> <li>The use, evaluation, and application of new, unproven mitigation techniques, technologies, methods, procedures, or products; Equipment and systems for the purpose of warning citizens of impending hazards; Purchase of permanently installed generators or related equipment, such as generator hook-ups; Hazard identification or mapping and related equipment for the implementation of mitigation activities; Geographic Information System (GIS) software, hardware, and data acquisition whose primary aim is mitigation; Public awareness or education campaigns about mitigation; and Evaluation of model building codes in support of future adoption and/or implementation.</li> </ul>	
<b>BACKGROUND INFORMATION</b>	
<b>Cost Benefit:</b>	Cost effectiveness for these project types are typically cannot be determined.
<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	All
<b>Goal(s) Addressed:</b>	1,2,3,4
<b>Category(s) Addressed:</b>	1,5,6,7
<b>Priority (High, Medium, Low):</b>	Medium
<b>Estimated Cost:</b>	Project Dependent
<b>Potential Funding Sources:</b>	HMGP
<b>Lead Agency/Responsible Department:</b>	VDEM, local project sponsors
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>Ongoing</b>
<b>ADDITIONAL COMMENTS</b>	
5% of total HMGP funding, per federal declaration, can be used to fund these projects.	





<b>Emergency Power for Vulnerable University Facilities</b>	
<b>Mitigation Action MH-8</b>	
2010 Mitigation Actions S-20 & S-29	
Evaluate and install emergency power generators sufficient to maintain critical business and research functions within vulnerable buildings.	
<b>BACKGROUND INFORMATION</b>	
<b>Cost Benefit:</b>	Not Determined
<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	All
<b>Goal(s) Addressed:</b>	1
<b>Category(s) Addressed:</b>	5
<b>Priority (High, Medium, Low):</b>	Medium
<b>Estimated Cost:</b>	Not Determined
<b>Potential Funding Sources:</b>	University Funds, HMGP
<b>Lead Agency/Responsible Department:</b>	Virginia Tech, University of Virginia, University of Virginia
<b>Implementation Schedule:</b>	As Funding Becomes Available
<b>Current Status:</b>	<b>In Progress</b>
<b>ADDITIONAL COMMENTS</b>	
<p><i>Virginia Tech</i> Generator switching gear installed in four buildings. Buildings are designated as shelter areas per the Virginia state shelter plan. Further infrastructure improvements are still required.</p> <p><i>University of Virginia</i> Assessment has been done with documented service needs of those buildings presently with generators. Assessment in progress of those buildings which do NOT have generators and would require them in order to maintain life safety.</p>	





<b>Utility Replacement at University of Virginia's College at Wise</b>	
<b>Mitigation Action MH-9</b>	
2010 Mitigation Action S-22	
Replace overhead power lines with underground.	
<b>BACKGROUND INFORMATION</b>	
<b>Cost Benefit:</b>	Not Determined
<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	All
<b>Goal(s) Addressed:</b>	1
<b>Category(s) Addressed:</b>	1,2,5
<b>Priority (High, Medium, Low):</b>	
<b>Estimated Cost:</b>	\$238,090
<b>Potential Funding Sources:</b>	Capital Projects, E&G and Auxiliary
<b>Lead Agency/Responsible Department:</b>	University of Virginia's College at Wise
<b>Implementation Schedule:</b>	As Funding Becomes Available
<b>Current Status:</b>	<b>In Progress</b>
<b>ADDITIONAL COMMENTS</b>	
The current status includes the placing the main electrical feed into campus via underground replacing the existing overhead line. This work is beginning this week, with a project cost of \$238,090. This is the most critical component in the overall campus replacement project. This project will affect the entire campus and reduces the potential for ice to bring down power lines.	





<b>Electrical Wiring for Future Emergency Generator Hook-Up</b>	
<b>Mitigation Action MH-10</b>	
2010 Mitigation Action S-23	
<p>Provide necessary electrical hook-up, wiring, and switches to allow readily accessible connections to emergency generators at State owned National Guard armories throughout the Commonwealth. National Guard facilities are often used by both the Guard and Localities during natural disasters such as hurricanes and major storms as command posts and places of temporary refuge. Loss of power to the building hampers emergency aid efforts and also affects the safety and well being of any occupant (military or civilian) during and after a storm event. Installation of electrical hook-up, wiring, and transfer switches to accommodate connection to an emergency generator will assure that these buildings can continue to be utilized during an emergency event.</p>	
<b>BACKGROUND INFORMATION</b>	
<b>Cost Benefit:</b>	Not Determined
<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	All
<b>Goal(s) Addressed:</b>	1
<b>Category(s) Addressed:</b>	5
<b>Priority (High, Medium, Low):</b>	Medium
<b>Estimated Cost:</b>	\$1.5 Million
<b>Potential Funding Sources:</b>	HMGP, Agency Funds
<b>Lead Agency/Responsible Department:</b>	DMA
<b>Implementation Schedule:</b>	As Funding Becomes Available
<b>Current Status:</b>	<b>Modified - In Progress</b>
<b>ADDITIONAL COMMENTS</b>	
<p>Virginia Facilities Management is currently tracking 47 Readiness Centers and 14 Field Maintenance Shops (FMS). At this time 12 Readiness Centers have operational Emergency Generators; another 4 have generators on site but have not been installed. Studies are underway for an additional 17 Readiness Centers to have generators installed in the future.</p>	





Installation of Emergency Power Systems	
<b>Mitigation Action MH-11</b>	
2010 Mitigation Actions S-24 – S-28	
Install generator to provide electrical power to 5 regional animal health laboratory facilities.	
BACKGROUND INFORMATION	
<b>Cost Benefit:</b>	Not Determined
MITIGATION ACTION DETAILS	
<b>Hazard(s) Addressed:</b>	All
<b>Goal(s) Addressed:</b>	1
<b>Category(s) Addressed:</b>	5
<b>Priority (High, Medium, Low):</b>	Low
<b>Estimated Cost:</b>	\$832,000
<b>Potential Funding Sources:</b>	Capital Budget Request
<b>Lead Agency/Responsible Department:</b>	VDACS
<b>Implementation Schedule:</b>	As Funding Becomes Available
<b>Current Status:</b>	<b>Not Started</b>
ADDITIONAL COMMENTS	
Project is dependent on funding.	





Encourage the Integration of Hazard Identification and Risk Assessment Data into Other State Plans/Programs.	
<b>Mitigation Action MH-12</b>	
2010 Mitigation Action P-3	
Incorporate the results of this State Hazard Mitigation Plan into state, local, and university COOPs, EOPs, hazard mitigation plans, etc., as needed.	
BACKGROUND INFORMATION	
<b>Cost Benefit:</b>	Not Determined
MITIGATION ACTION DETAILS	
<b>Hazard(s) Addressed:</b>	All
<b>Goal(s) Addressed:</b>	3
<b>Category(s) Addressed:</b>	1,7
<b>Priority (High, Medium, Low):</b>	High
<b>Estimated Cost:</b>	Agency Funds
<b>Potential Funding Sources:</b>	Agency Funds
<b>Lead Agency/Responsible Department:</b>	VDEM
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>Ongoing</b>
ADDITIONAL COMMENTS	
The results of the HIRA are incorporated into the Commonwealth of Virginia Emergency Operations Plan (COVEOP). In addition, the HIRA provides supporting historical reference for the FEMA required THIRA. Also, the HIRA process has incorporated private infrastructure elements such as statewide pipelines that will be used as an outreach and education tool. The state HIRA is also incorporated into each local and university hazard mitigation plan.	





Encourage Sharing of HIRA Data Between Local Plans and State Plan	
<b>Mitigation Action MH-13</b>	
2010 Mitigation Action P-4	
<p>Work with local planning district commissions to encourage the methodology used in the state HIRA to be utilized in plan updates. This allows for a consistent way to share data between local plans and state plans with regard to integration. Data can be shared from local plans up to the state, and vice versa to make the process a more fluid and living planning effort.</p>	
BACKGROUND INFORMATION	
<b>Cost Benefit:</b>	Not Determined
MITIGATION ACTION DETAILS	
<b>Hazard(s) Addressed:</b>	All
<b>Goal(s) Addressed:</b>	2,3
<b>Category(s) Addressed:</b>	1,5,7
<b>Priority (High, Medium, Low):</b>	Medium
<b>Estimated Cost:</b>	Not Determined
<b>Potential Funding Sources:</b>	Agency Funds
<b>Lead Agency/Responsible Department:</b>	VDEM
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>Modified - Ongoing</b>
ADDITIONAL COMMENTS	
<p>The action has been modified, and several local hazard mitigation plans have modeled the 2010 HIRA for their plan updates.</p>	







Promote DRU Plans to Public and Private Universities	
<b>Mitigation Action MH-14</b>	
2010 Mitigation Actions P-6 and P-7	
<p>Promote DRU plans to public universities that do not currently have DRU plans. Also provide outreach to existing DRU plans about updating their plans. If eligible applicants apply on their behalf, private universities can also participate on the DRU process.</p>	
BACKGROUND INFORMATION	
<b>Cost Benefit:</b>	Not Determined
MITIGATION ACTION DETAILS	
<b>Hazard(s) Addressed:</b>	All
<b>Goal(s) Addressed:</b>	2
<b>Category(s) Addressed:</b>	1,7
<b>Priority (High, Medium, Low):</b>	Medium
<b>Estimated Cost:</b>	Not Determined
<b>Potential Funding Sources:</b>	HMA Funds
<b>Lead Agency/Responsible Department:</b>	VDEM
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>Ongoing</b>
ADDITIONAL COMMENTS	
<p>Since the 2010 plan, William and Mary University as well as Southwest Virginia Community College have received funding to develop DRU plans.</p>	





State Agency Continuity of Operations Planning	
Mitigation Action MH-17	
2010 Mitigation Action P-9	
As per Governor’s Executive Order, all state agencies are required to develop a Continuity of Operations Plan (COOP) and update the plan annually.	
BACKGROUND INFORMATION	
<b>Cost Benefit:</b>	Not Determined
MITIGATION ACTION DETAILS	
<b>Hazard(s) Addressed:</b>	All
<b>Goal(s) Addressed:</b>	2
<b>Category(s) Addressed:</b>	1,5,7
<b>Priority (High, Medium, Low):</b>	Low
<b>Estimated Cost:</b>	Not Determined
<b>Potential Funding Sources:</b>	Not Determined
<b>Lead Agency/Responsible Department:</b>	All State Agencies
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>Completed</b>
ADDITIONAL COMMENTS	
All Executive Branch Agencies in the Commonwealth have COOP plans.	





<h2 style="margin: 0;">Continuity of Government Planning</h2>	
<h3 style="margin: 0;">Mitigation Action MH-18</h3>	
2010 Mitigation Action P-10	
Develop and establish Commonwealth Essential Functions (CEFs). Work with state agencies to identify agency Mission Essential Functions (MEFs) that directly support CEFs, and in the development of Continuity Plans to ensure essential services are available to citizens during a disaster or disruption of services.	
<h3 style="margin: 0;">BACKGROUND INFORMATION</h3>	
<b>Cost Benefit:</b>	Not Determined
<h3 style="margin: 0;">MITIGATION ACTION DETAILS</h3>	
<b>Hazard(s) Addressed:</b>	All
<b>Goal(s) Addressed:</b>	2
<b>Category(s) Addressed:</b>	1,5,7
<b>Priority (High, Medium, Low):</b>	High
<b>Estimated Cost:</b>	Not Determined
<b>Potential Funding Sources:</b>	Agency Funds
<b>Lead Agency/Responsible Department:</b>	All State Agencies
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>Modified - Ongoing</b>
<h3 style="margin: 0;">ADDITIONAL COMMENTS</h3>	





Gain Support to Incorporate Hazard Mitigation Planning into Local Comprehensive Plans	
<b>Mitigation Action MH-19</b>	
2010 Mitigation Action P-11	
Work with Governor’s office, state Secretary’s and General Assembly to incorporate the hazard mitigation planning process into the local comprehensive planning process, thus working to solidify these principles and methods into planning at the local level.	
BACKGROUND INFORMATION	
<b>Cost Benefit:</b>	Not Determined
MITIGATION ACTION DETAILS	
<b>Hazard(s) Addressed:</b>	All
<b>Goal(s) Addressed:</b>	2
<b>Category(s) Addressed:</b>	1,6
<b>Priority (High, Medium, Low):</b>	High
<b>Estimated Cost:</b>	Not Determined
<b>Potential Funding Sources:</b>	Not Determined
<b>Lead Agency/Responsible Department:</b>	Virginia Department of Emergency Management
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>Ongoing</b>
ADDITIONAL COMMENTS	
Recommendations have been provided by VDEM for legislative review and consideration over the last three legislative sessions. This remains an ongoing strategy.	





Operational Security Review of Sensitive Data	
Mitigation Action MH-20	
2010 Mitigation Action H-1	
<p>As state planning documents reach final draft stages, an operational security review will be performed. Any information that is deemed to be sensitive will be identified and options explored such as removal of the material deemed sensitive from the public version of the document or establishment of an un-edited version in a secure manner.</p>	
BACKGROUND INFORMATION	
<b>Cost Benefit:</b>	Not Determined
MITIGATION ACTION DETAILS	
<b>Hazard(s) Addressed:</b>	All
<b>Goal(s) Addressed:</b>	3
<b>Category(s) Addressed:</b>	1,5,7
<b>Priority (High, Medium, Low):</b>	Medium
<b>Estimated Cost:</b>	Not Determined
<b>Potential Funding Sources:</b>	Agency Funds
<b>Lead Agency/Responsible Department:</b>	VDEM
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>Ongoing</b>
ADDITIONAL COMMENTS	
<p>Several internal SOP's have been developed for operation security review and handling requests for secure versions of plans that are not available for public viewing.</p>	





<b>Continued Natural Hazard Information Collection and Sharing</b>	
<b>Mitigation Action MH-21</b>	
2010 Mitigation Action H-3	
<p>As events occur in the Commonwealth, develop an ongoing method to collect, organized, and analyze data as needed. Hold bi-annual meetings/conference calls to discuss improvements in data collection. Compile all data in a GIS format, when appropriate, for future revisions of the plan and distribution to other state agencies, universities, and local governments.</p>	
<b>BACKGROUND INFORMATION</b>	
<b>Cost Benefit:</b>	Not Determined
<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	All
<b>Goal(s) Addressed:</b>	3
<b>Category(s) Addressed:</b>	1,5,6
<b>Priority (High, Medium, Low):</b>	High
<b>Estimated Cost:</b>	Not Determined
<b>Potential Funding Sources:</b>	Agency Funds, HMA Funds
<b>Lead Agency/Responsible Department:</b>	VDEM, DMME, DCR, DOF, VT CGIT, State Climatology Office, FEMA, USGS, NWS, USACE
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>Ongoing</b>
<b>ADDITIONAL COMMENTS</b>	
<p>As large events occur across the Commonwealth, data is collected among appropriate agencies. Every three years this data is updated and incorporated into the state HIRA.</p>	





<b>Incorporate Hazard Mitigation into Data Collection Processes for State Facilities and Assets</b>	
<b>Mitigation Action MH-22</b>	
2010 Mitigation Action H-6	
Identify state agencies that collect data specific to state owned and operated facilities and assets and identify ways to incorporate information needed for mitigation in their data collection process. This prevents duplication of efforts involved in creating a “centralized database” when collection and maintenance of data is already taking place. When updates for the state plan are needed, simple data acquisition can take place rather than the creation and maintenance of a separate database.	
<b>BACKGROUND INFORMATION</b>	
<b>Cost Benefit:</b>	Not Determined
<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	All
<b>Goal(s) Addressed:</b>	3
<b>Category(s) Addressed:</b>	1,5,7
<b>Priority (High, Medium, Low):</b>	High
<b>Estimated Cost:</b>	Not Determined
<b>Potential Funding Sources:</b>	Not Determined
<b>Lead Agency/Responsible Department:</b>	VDEM, DGS, DTRM, Other Agencies
<b>Implementation Schedule:</b>	Long Term
<b>Current Status:</b>	<b>Modified - Ongoing</b>
<b>ADDITIONAL COMMENTS</b>	
No progress has been made on the original action, in large part because of limited staff, and the information would not be cost-effective to create at the statewide level for local assets. Thus, the project has been reviewed and modified.	





<b>Promote More Mitigation Strategies from State Agencies</b>	
<b>Mitigation Action MH-23</b>	
2010 Mitigation Action O-1	
<p>As a result of the revised HIRA, the state facility analysis was improved due to improved data. VDEM will work with DGS to provide outreach to those state agencies and promote awareness to those facility managers of the natural hazards they may be vulnerable to. The goal is to promote more strategies that involve the mitigation of state facilities.</p>	
<b>BACKGROUND INFORMATION</b>	
<b>Cost Benefit:</b>	Not Determined
<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	All
<b>Goal(s) Addressed:</b>	4
<b>Category(s) Addressed:</b>	1,2,3,4,5,6,7
<b>Priority (High, Medium, Low):</b>	High
<b>Estimated Cost:</b>	Not Determined
<b>Potential Funding Sources:</b>	HMGP, PDM, FMA
<b>Lead Agency/Responsible Department:</b>	VDEM
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>Ongoing</b>
<b>ADDITIONAL COMMENTS</b>	
<p>For the 2013 update of this plan, individual risk based reports were distributed to state agencies that had facilities in high hazard areas. The reports include a variety of mitigation options in which the state agency can select to reduce risk to the facility. This is an ongoing process.</p>	







<b>Hazard Mitigation Planning Toolkit</b>	
<b>Mitigation Action MH-24</b>	
2010 Mitigation Action O-3	
Update and improve on the hazard mitigation toolkit which includes various FEMA and VDEM planning and project documents, and a mechanism for reporting annually on the status of local and state mitigation strategies.	
<b>BACKGROUND INFORMATION</b>	
<b>Cost Benefit:</b>	Not Determined
<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	All
<b>Goal(s) Addressed:</b>	4
<b>Category(s) Addressed:</b>	6
<b>Priority (High, Medium, Low):</b>	High
<b>Estimated Cost:</b>	Not Determined
<b>Potential Funding Sources:</b>	Agency Funds
<b>Lead Agency/Responsible Department:</b>	VDEM
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>Modified - Ongoing</b>
<b>ADDITIONAL COMMENTS</b>	
The toolkit is available on the VDEM Website, <a href="http://www.vaemergency.gov/content/mitigation-toolkit">http://www.vaemergency.gov/content/mitigation-toolkit</a>	





State Hazard Mitigation Website Maintenance	
Mitigation Action MH-25	
2010 Mitigation Action O-4	
<p>Maintain and develop a website or sub-site from VDEM to provide current information and data about the state and local hazard mitigation process. This site should include information related to local efforts, state efforts, links to hazard assessment data and methods and state and FEMA guidance on the mitigation planning process generally. Also included should be best practices for structural mitigation projects.</p>	
BACKGROUND INFORMATION	
<b>Cost Benefit:</b>	Not Determined
MITIGATION ACTION DETAILS	
<b>Hazard(s) Addressed:</b>	All
<b>Goal(s) Addressed:</b>	4
<b>Category(s) Addressed:</b>	6
<b>Priority (High, Medium, Low):</b>	High
<b>Estimated Cost:</b>	Not Determined
<b>Potential Funding Sources:</b>	Not Determined
<b>Lead Agency/Responsible Department:</b>	VDEM
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>Modified - Ongoing</b>
ADDITIONAL COMMENTS	
<p>Discussions are occurring regarding updating information specific to recovery and mitigation on website.</p>	





Local Training on Hazard Mitigation Planning Process	
Mitigation Action MH-26	
2010 Mitigation Action O-5	
Provide local training on Hazard Mitigation Planning Process (G393), and work towards improving this course in the future. Provide technical assistance to planning district commissions as they update local hazard mitigation plans.	
BACKGROUND INFORMATION	
<b>Cost Benefit:</b>	Not Determined
MITIGATION ACTION DETAILS	
<b>Hazard(s) Addressed:</b>	All
<b>Goal(s) Addressed:</b>	4
<b>Category(s) Addressed:</b>	6
<b>Priority (High, Medium, Low):</b>	High
<b>Estimated Cost:</b>	Not Determined
<b>Potential Funding Sources:</b>	Agency Funds
<b>Lead Agency/Responsible Department:</b>	VDEM
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>Modified - Ongoing</b>
ADDITIONAL COMMENTS	
Course G393 is typically administered 2 times a year. VDEM mitigation staff regularly attends mitigation planning meetings and provide technical assistance.	





<b>Train VDEM Divisions in Mitigation Project Development</b>	
<b>Mitigation Action MH-27</b>	
2010 Mitigation Action O-7	
Train and work with other VDEM programs/divisions to identify and describe potential mitigation projects related to their particular programs.	
<b>BACKGROUND INFORMATION</b>	
<b>Cost Benefit:</b>	Not Determined
<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	All
<b>Goal(s) Addressed:</b>	4
<b>Category(s) Addressed:</b>	6
<b>Priority (High, Medium, Low):</b>	Medium
<b>Estimated Cost:</b>	Not Determined
<b>Potential Funding Sources:</b>	Agency Funds
<b>Lead Agency/Responsible Department:</b>	VDEM
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>Not Started</b>
<b>ADDITIONAL COMMENTS</b>	
First training will take place in February 2013. Due to recent disaster declarations, internal training had to be postponed.	





<b>Mitigation Best Practices Development</b>	
<b>Mitigation Action MH-28</b>	
2010 Mitigation Action O-12	
Develop a simple method to identify and record the ongoing mitigation success stories from across the Commonwealth. Identify the critical information/data needed to show the full benefits of these actions over time.	
<b>BACKGROUND INFORMATION</b>	
<b>Cost Benefit:</b>	Not Determined
<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	All
<b>Goal(s) Addressed:</b>	4
<b>Category(s) Addressed:</b>	6
<b>Priority (High, Medium, Low):</b>	Medium
<b>Estimated Cost:</b>	Not Determined
<b>Potential Funding Sources:</b>	Agency Funds
<b>Lead Agency/Responsible Department:</b>	VDEM
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>Ongoing</b>
<b>ADDITIONAL COMMENTS</b>	
As projects come to completion, VDEM is constantly looking for best practices. Loss avoidance studies are excellent ways to demonstrate that mitigation works, and that the upfront investment saves money long term.	





Building Emergency Evacuation Program	
Mitigation Action MH-29	
2010 Mitigation Action O-13	
<p>Develop and distribute internet and compact disk based evacuation plans for all facilities managed by the Department of General Services serving approximately 5 million sq. ft. Based on the general structure, the procedures for each building would be customized to meet actual requirements using video and digital picture technology. Evacuation plans would be web-based and each agency in a facility would receive a CD/DVD version for group training sessions.</p>	
BACKGROUND INFORMATION	
<b>Cost Benefit:</b>	Not Determined
MITIGATION ACTION DETAILS	
<b>Hazard(s) Addressed:</b>	All
<b>Goal(s) Addressed:</b>	2
<b>Category(s) Addressed:</b>	5
<b>Priority (High, Medium, Low):</b>	Low
<b>Estimated Cost:</b>	Not Determined
<b>Potential Funding Sources:</b>	Not Started
<b>Lead Agency/Responsible Department:</b>	DGS
<b>Implementation Schedule:</b>	As funding becomes available
<b>Current Status:</b>	<b>Not Started</b>
ADDITIONAL COMMENTS	
<p>Implementation is dependent on funding.</p>	





<b>Use State Facility HIRA to Attempt to Reduce Insurance Premiums for State Owned Facilities</b>	
<b>Mitigation Action MH-30</b>	
2010 Mitigation Action O-14	
Other states have taken advantage of state facility risk assessments to reduce insurance rates for the state. It is VDEM’s strategy to coordinate with the Department of Treasury to determine how the state can lower insurance on state facilities as a result of facilities with low risk in the revised HIRA	
<b>BACKGROUND INFORMATION</b>	
<b>Cost Benefit:</b>	Not Determined
<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	All
<b>Goal(s) Addressed:</b>	2
<b>Category(s) Addressed:</b>	6
<b>Priority (High, Medium, Low):</b>	Low
<b>Estimated Cost:</b>	Not Determined
<b>Potential Funding Sources:</b>	Agency Funds
<b>Lead Agency/Responsible Department:</b>	VDEM, DTRM
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>Ongoing</b>
<b>ADDITIONAL COMMENTS</b>	
Initial discussions are taking place between VDEM and DTRM.	





<b>Assessment of Inundation Hazards Related to Mining-Related Impoundments</b>	
<b>Mitigation Action MH-31</b>	
2010 Mitigation Action H-14	
<p>Emergency Management (VDEM), DMME will identify and implement methods to map potential inundation hazard areas of mining-related dams and impoundments using GIS-based applications. Potential hazard areas identified by this assessment will be integrated with other dam hazards databases, as needed, and made available to the public and locality land use planning authorities for emergency planning purposes.</p>	
<b>BACKGROUND INFORMATION</b>	
<b>Cost Benefit:</b>	Not Determined
<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Dam Failure, Flood
<b>Goal(s) Addressed:</b>	3
<b>Category(s) Addressed:</b>	6,7
<b>Priority (High, Medium, Low):</b>	Low
<b>Estimated Cost:</b>	\$250,000
<b>Potential Funding Sources:</b>	Not Determined
<b>Lead Agency/Responsible Department:</b>	DMME
<b>Implementation Schedule:</b>	Short Term
<b>Current Status:</b>	<b>Not Started</b>
<b>ADDITIONAL COMMENTS</b>	
<p>DMME currently lacks the staff to undertake this project. The agency continues to seek sources of external funding to carry out this work.</p>	







Enhanced Statewide Public Education Program	
Mitigation Action MH-32	
2012 Mitigation Action O-11	
Increase the general public’s knowledge of disaster preparedness with emphasis on hurricane through an enhanced public education program – ReadyVirginia.gov.	
BACKGROUND INFORMATION	
<b>Cost Benefit:</b>	Not determined
MITIGATION ACTION DETAILS	
<b>Hazard(s) Addressed:</b>	Hurricane, Flood, Tornado, Earthquake, and Winter Weather
<b>Goal(s) Addressed:</b>	4
<b>Category(s) Addressed:</b>	6
<b>Priority (High, Medium, Low):</b>	Medium
<b>Estimated Cost:</b>	Project dependent
<b>Potential Funding Sources:</b>	Agency Funds, HMGP
<b>Lead Agency/Responsible Department:</b>	VDEM
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>Ongoing</b>
ADDITIONAL COMMENTS	
In 2012 over 800,000 Virginian’s participated in the 2012 Statewide Tornado Drill. Also, over 900,000 participated in the Great Southeast Shakeout in 2012.	





<b>Encourage Analysis of Pipelines and other Critical Infrastructure in Local Hazard Mitigation Plans</b>	
<b>Mitigation Action MH-33</b>	
New Mitigation Action	
<p>VDEM staff in conjunction with Pipelines and Informed Planning Alliance (PIPA) will encourage the integration of energy pipelines and other critical infrastructure into local and state HIRA's. When critical infrastructure is impacted as a result of a natural hazard, it greatly impacts the community's ability to respond and recover from a disaster. Identifying potential vulnerabilities and putting forth actions to mitigate them will be critical in reducing long term risk. PIPA promotes risk-informed land use and development near transmission energy pipelines.</p>	
<b>BACKGROUND INFORMATION</b>	
<b>Cost Benefit:</b>	Not determined
<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	All
<b>Goal(s) Addressed:</b>	1,2
<b>Category(s) Addressed:</b>	1,3,5,6,7
<b>Priority (High, Medium, Low):</b>	Low
<b>Estimated Cost:</b>	Not determined
<b>Potential Funding Sources:</b>	US Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA) Technical Assistance Grants (TAG)
<b>Lead Agency/Responsible Department:</b>	VDEM
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>New Action</b>
<b>ADDITIONAL COMMENTS</b>	





<b>Official Recognition of the Virginia Hazard Mitigation Advisory Committee</b>	
<b>Mitigation Action MH-34</b>	
New Mitigation Action	
Work through the Secretary of Public Safety’s Office to obtain official recognition of the Virginia Hazard Mitigation Advisory Committee.	
<b>BACKGROUND INFORMATION</b>	
<b>Cost Benefit:</b>	Not determined
<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	All
<b>Goal(s) Addressed:</b>	2
<b>Category(s) Addressed:</b>	5,6
<b>Priority (High, Medium, Low):</b>	High
<b>Estimated Cost:</b>	Not determined
<b>Potential Funding Sources:</b>	Agency Funds
<b>Lead Agency/Responsible Department:</b>	VDEM
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>New Action</b>
<b>ADDITIONAL COMMENTS</b>	





Continue Holding Annual HMA Grant Workshops	
<b>Mitigation Action MH-35</b>	
2010 Mitigation Action O-2	
<p>Continue holding annual HMA grant workshops in concurrence with the annual HMA application period. These workshops focus on the 5 HMA grant programs and how to build a strong application. The location of these workshops is determined by each VDEM region. If there are HMGP funds available, HMA workshops will be worked into HMGP briefings through webinar.</p>	
BACKGROUND INFORMATION	
<b>Cost Benefit:</b>	Not Determined
MITIGATION ACTION DETAILS	
<b>Hazard(s) Addressed:</b>	All
<b>Goal(s) Addressed:</b>	4
<b>Category(s) Addressed:</b>	6
<b>Priority (High, Medium, Low):</b>	High
<b>Estimated Cost:</b>	\$1,000 per workshop
<b>Potential Funding Sources:</b>	Agency Funds
<b>Lead Agency/Responsible Department:</b>	VDEM
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>Modified - Ongoing</b>
ADDITIONAL COMMENTS	
<p>VDEM continues to hold annual HMA workshops. For 2012, with 4 open disaster declarations the focus was on HMGP applicant's briefings.</p>	





Encourage Analysis of Emergency Preparedness for Pipeline Emergencies in State and Local Hazard Mitigation Plans	
<b>Mitigation Action MH-36</b>	
New Action	
<p>Recent pipeline incidents have highlighted the need for communities to be adequately prepared for pipeline emergencies. An investigation of several incidents revealed that the local emergency responders were not adequately prepared to respond to the pipeline emergency. VDEM staff in conjunction with US Department of Transportation Pipeline and Hazardous Material Safety Administration (PHMSA) will review Virginia's emergency preparedness to respond to energy pipeline failures at the state level. Local HIRA's are encouraged to review their local capability to respond to energy pipeline emergencies. Identifying potential vulnerabilities and putting forth actions to prepare an effective response to them will be critical in reducing long term risk.</p>	
BACKGROUND INFORMATION	
<b>Cost Benefit:</b>	Not Determined
MITIGATION ACTION DETAILS	
<b>Hazard(s) Addressed:</b>	All
<b>Goal(s) Addressed:</b>	1,2
<b>Category(s) Addressed:</b>	1,3,5,6,7
<b>Priority (High, Medium, Low):</b>	Low
<b>Estimated Cost:</b>	Not Determined
<b>Potential Funding Sources:</b>	US Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA) Technical Assistance Grants (TAG)
<b>Lead Agency/Responsible Department:</b>	VDEM
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>New Action</b>
ADDITIONAL COMMENTS	





<b>Wildfire Mitigation</b>	
<b>Mitigation Action W-1</b>	
2010 Mitigation Action S-18	
<p>Assist localities, state agencies, PDCs, and eligible PNP’s to identify vulnerable structures and apply for funding to implement wildfire mitigation projects. These are projects to mitigate the risk to at-risk structures and associated loss of life from the threat of future wildfire through:</p> <ul style="list-style-type: none"> <li>• Defensible Space for Wildfire</li> <li>• Application of Ignition-resistant Construction</li> <li>• Hazardous Fuels Reduction</li> </ul>	
<b>BACKGROUND INFORMATION</b>	
<b>Cost Benefit:</b>	Wildfire mitigation projects generally have proven to be cost effective, due to the relatively low cost to implement.
<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Wildfire
<b>Goal(s) Addressed:</b>	1
<b>Category(s) Addressed:</b>	2
<b>Priority (High, Medium, Low):</b>	Medium
<b>Estimated Cost:</b>	Project Dependent
<b>Potential Funding Sources:</b>	HMGP, PDM
<b>Lead Agency/Responsible Department:</b>	VDEM and DOF
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>New Action - Ongoing</b>
<b>ADDITIONAL COMMENTS</b>	
<p>VDEM and DOF are working closely together to identify a community for a pilot project for wildfire mitigation funding. The idea is that if one community can be used as an example in Virginia, then other communities will take notice and interest.</p> <p>This project type is completely voluntary, and requires written voluntary participation agreements from property owners. Individual property owners cannot apply directly to FEMA, they are required to work through their community or other eligible entity as a sponsor.</p>	





<h2 style="margin: 0;">Training for Virginia’s Fire Service</h2>	
<h3 style="margin: 0;">Mitigation Action W-2</h3>	
2010 Mitigation Action O-9	
To continue ongoing fire and emergency services to over 800 fire and EMS departments across the Commonwealth. VDFP is the only accredited entity for training Virginia’s Fire Service.	
<h3 style="margin: 0;">BACKGROUND INFORMATION</h3>	
<b>Cost Benefit:</b>	Not Determined
<h3 style="margin: 0;">MITIGATION ACTION DETAILS</h3>	
<b>Hazard(s) Addressed:</b>	Wildfire
<b>Goal(s) Addressed:</b>	4
<b>Category(s) Addressed:</b>	5,6
<b>Priority (High, Medium, Low):</b>	Low
<b>Estimated Cost:</b>	\$2.1 Million
<b>Potential Funding Sources:</b>	Fire Programs Fund
<b>Lead Agency/Responsible Department:</b>	VDFP
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>Ongoing</b>
<h3 style="margin: 0;">ADDITIONAL COMMENTS</h3>	
The Department of Fire Programs (VDFP) continues to provide Pro Board accredited training to Virginia’s fire services community. In doing so, the Agency continues to strengthen the preparedness of Virginia’s localities in the event of a man-made or natural disaster.	





<b>Landslide Hazard Mapping Program</b>	
<b>Mitigation Action L-1</b>	
2010 Mitigation Action H-12	
<p>Landslide hazard maps are needed in Virginia to identify high risk areas for emergency and land use planning purposes. Provide GIS-based maps that identify areas at higher risk for damage from landslides, including debris flows, suitable for emergency and land use planning purposes. Mapping will target areas with a high susceptibility to landslides. Work will be prioritized by locality based on overall VDEM landslide hazard ranking.</p>	
<b>BACKGROUND INFORMATION</b>	
<b>Cost Benefit:</b>	Not Determined
<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Landslide
<b>Goal(s) Addressed:</b>	3
<b>Category(s) Addressed:</b>	6,7
<b>Priority (High, Medium, Low):</b>	Medium
<b>Estimated Cost:</b>	\$16 Million
<b>Potential Funding Sources:</b>	Not Determined, HMGP 5%
<b>Lead Agency/Responsible Department:</b>	DMME
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>Ongoing</b>
<b>ADDITIONAL COMMENTS</b>	
<p>Pilot project for landslide mapping underway in Page County. This project was funded through HMGP 5% initiative funds for DR 1874.</p>	







## Delineation of Watersheds & Recharge Areas for Karst Aquifers in VA and Compilation of GIS-based Comprehensive Karst Hydrology for Virginia

### Mitigation Action K-1

2010 Mitigation Action H-9

The VA DCR Karst Program is engaged in a project to delineate watersheds and define recharge areas for karst aquifers in VA. A GIS-based VA Karst Hydrology Atlas is being completed detailing karst groundwater dye tracing investigations. The current Karst Program dye tracing work is to produce data to provide a hydrologic basis for defining conservation site boundaries for VA’s significant caves. Given significant resources, it would be desirable to perform hydrologic investigations including extensive groundwater dye tracing throughout VA’s karst areas. If it was available, knowledge of underground flow paths would be invaluable information for planning and for emergency services personnel in the event of a hazardous material event in VA’s karst lands.

### BACKGROUND INFORMATION

**Cost Benefit:**

Not Determined

### MITIGATION ACTION DETAILS

<b>Hazard(s) Addressed:</b>	Karst
<b>Goal(s) Addressed:</b>	3
<b>Category(s) Addressed:</b>	6,7
<b>Priority (High, Medium, Low):</b>	Low
<b>Estimated Cost:</b>	Not Determined
<b>Potential Funding Sources:</b>	Not Determined
<b>Lead Agency/Responsible Department:</b>	DCR Division of Natural Heritage
<b>Implementation Schedule:</b>	As Funding Becomes Available
<b>Current Status:</b>	<b>Ongoing</b>

### ADDITIONAL COMMENTS

This action item is still relevant and a viable option, but is highly dependent on funding to implement.





<b>Karst Hazard Mapping Program</b>	
<b>Mitigation Action K-2</b>	
2010 Mitigation Action H-10	
<p>Assessments conducted by DMME of known karst and sinkhole locations are currently available only in a non-digital format and at scales that are inadequate for site-specific decision making. There is a substantial need to complete the geologic mapping, digital conversion, and quality assurance of this data. Working in cooperation with the DCR Natural Heritage Karst Program, DMME will complete the digital conversion of currently available karst and sinkhole location maps to digital products using GIS-based mapping applications. Derivative maps will also be produced that delineate the relative susceptibility to karst development and related hazards of mapped carbonate bedrock formations in the Valley and Ridge physiographic province.</p>	
<b>BACKGROUND INFORMATION</b>	
<b>Cost Benefit:</b>	Not Determined
<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Karst
<b>Goal(s) Addressed:</b>	3
<b>Category(s) Addressed:</b>	6,7
<b>Priority (High, Medium, Low):</b>	Low
<b>Estimated Cost:</b>	\$650,000
<b>Potential Funding Sources:</b>	Not Determined, possibly HMGP 5% Initiative
<b>Lead Agency/Responsible Department:</b>	DMME, and DCR
<b>Implementation Schedule:</b>	As Funding Becomes Available
<b>Current Status:</b>	<b>In Progress</b>
<b>ADDITIONAL COMMENTS</b>	
<p>The existing DMME sinkhole dataset has been converted to GIS format and QA/QC has been completed. A project plan and funding are still needed to develop karst susceptibility and related hazards maps.</p>	





GIS Fault Mapping of Central Virginia Seismic Zone	
Mitigation Action E-1	
New Action	
<p>This project will use historical data, published reports, terrain analysis and new mapping to identify faults that cause earthquakes in the west half of the Central Virginia Seismic Zone. Communities and infrastructure at risk of future damage will be identified. Results will be provided in GIS format to affected communities. Results will also be incorporated into future State and local HIRAs.</p>	
BACKGROUND INFORMATION	
<b>Cost Benefit:</b>	Not Determined
MITIGATION ACTION DETAILS	
<b>Hazard(s) Addressed:</b>	Earthquake
<b>Goal(s) Addressed:</b>	3
<b>Category(s) Addressed:</b>	6,7
<b>Priority (High, Medium, Low):</b>	High
<b>Estimated Cost:</b>	\$300,000
<b>Potential Funding Sources:</b>	Not Determined, possibly HMGP 5% Initiative
<b>Lead Agency/Responsible Department:</b>	DMME
<b>Implementation Schedule:</b>	As Funding Becomes Available
<b>Current Status:</b>	<b>New Action</b>
ADDITIONAL COMMENTS	





<b>Comprehensive Dam Information Database Development</b>	
<b>Mitigation Action DF-1</b>	
2010 Mitigation Action H-7	
Identify and convene committee to identify, coordinate and collect relevant data for use in a single comprehensive database of ALL dams located in or affecting the Commonwealth of Virginia.	
<b>BACKGROUND INFORMATION</b>	
<b>Cost Benefit:</b>	Not Determined
<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood, Dam Failure
<b>Goal(s) Addressed:</b>	3,4
<b>Category(s) Addressed:</b>	6,7
<b>Priority (High, Medium, Low):</b>	Low
<b>Estimated Cost:</b>	Not Determined
<b>Potential Funding Sources:</b>	Agency Funds
<b>Lead Agency/Responsible Department:</b>	DCR, USACE
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>Ongoing</b>
<b>ADDITIONAL COMMENTS</b>	
USACE maintains the National Inventory of Dams, and DCR Division of Dam Safety and Floodplain Management provide data from Virginia.	





<h2 style="margin: 0;">Dam Inundation Areas Mapping and Risk Assessment</h2>	
<h3 style="margin: 0;">Mitigation Action DF-2</h3>	
2010 Mitigation Action H-8	
Identify and implement a method to map and assess the hazards of dam inundation areas in the Commonwealth of Virginia. Will require protection of sensitive data as completed	
<h3 style="margin: 0;">BACKGROUND INFORMATION</h3>	
<b>Cost Benefit:</b>	Not Determined
<h3 style="margin: 0;">MITIGATION ACTION DETAILS</h3>	
<b>Hazard(s) Addressed:</b>	Flood, Dam Failure
<b>Goal(s) Addressed:</b>	3,4
<b>Category(s) Addressed:</b>	6,7
<b>Priority (High, Medium, Low):</b>	Medium
<b>Estimated Cost:</b>	Not Determined
<b>Potential Funding Sources:</b>	Dam Owners
<b>Lead Agency/Responsible Department:</b>	DCR
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>Ongoing</b>
<h3 style="margin: 0;">ADDITIONAL COMMENTS</h3>	
Regulated dam owners are now required to perform downstream dam inundation modeling. Since this is based on individual dam owners, this is an ongoing process.	





<b>Install Fire Alarm and Sprinkler Systems at DBHDS Facilities</b>	
<b>Mitigation Action HC-7</b>	
2010 Mitigation Actions S-13, S-14, S-15	
Install automatic fire sprinkler and fire alarm systems throughout these buildings.	
<b>BACKGROUND INFORMATION</b>	
<b>Cost Benefit:</b>	246 patients and staff are protected by this action.
<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Human Caused
<b>Goal(s) Addressed:</b>	1
<b>Category(s) Addressed:</b>	2
<b>Priority (High, Medium, Low):</b>	Low
<b>Estimated Cost:</b>	\$127,150,000
<b>Potential Funding Sources:</b>	Virginia Public Building Authority Bonds and local leveraging
<b>Lead Agency/Responsible Department:</b>	DBHDS
<b>Implementation Schedule:</b>	2 years
<b>Current Status:</b>	<b>In Progress</b>
<b>ADDITIONAL COMMENTS</b>	
<p><b><u>Western State Hospital</u></b> - A project for the replacement of Western State Hospital is approximately 65% complete. Project completion and occupancy is scheduled for September/October, 2013.</p> <p><b><u>Central Virginia Training Center</u></b> - This project involves the installation of fire alarm and sprinkler systems in approximately 10 buildings. The fire alarm system has been replaced facility-wide. Emergency generators have been installed in 5 buildings. Renovations have been accomplished in one building to relocate patients from a non-code compliant building. Sprinkler systems are being installed as a part of total building renovations, and have been completed in three buildings. Design is underway for the total renovation of a fourth building.</p> <p><b><u>Northern Virginia Training Center</u></b> - 5 Buildings were mitigated, protecting 135 facility residents and staff. Awaiting legislative funding on two remaining buildings.</p>	





<h2 style="margin: 0;">Improve Fire Safety in University Buildings</h2>	
<h3 style="margin: 0;">Mitigation Action HC-8</h3>	
2010 Mitigation Actions S-7, S-16, S-17	
Evaluate existing buildings with unenclosed multi-story stairwells to determine if enclosure of the stairwells and/or sprinkling would assure an adequate level of fire safety; once study is completed, implement retrofits on prioritized basis.	
<h3 style="margin: 0;">BACKGROUND INFORMATION</h3>	
<b>Cost Benefit:</b>	Not Determined
<h3 style="margin: 0;">MITIGATION ACTION DETAILS</h3>	
<b>Hazard(s) Addressed:</b>	Human Caused
<b>Goal(s) Addressed:</b>	1
<b>Category(s) Addressed:</b>	2
<b>Priority (High, Medium, Low):</b>	Low
<b>Estimated Cost:</b>	Not Determined and Building Specific
<b>Potential Funding Sources:</b>	Not Determined
<b>Lead Agency/Responsible Department:</b>	State Universities
<b>Implementation Schedule:</b>	As Funding Becomes Available
<b>Current Status:</b>	<b>Modified - Ongoing</b>
<h3 style="margin: 0;">ADDITIONAL COMMENTS</h3>	
<p><i>Virginia Tech</i> - There are still many campus buildings that have unenclosed stairways and need sprinkler systems. One building has had a fire alarm system installed in 2012. Four buildings have had fire alarm systems upgraded or expanded and 2 other buildings that had fire alarm systems that needed upgrade are in the process of capital renovation that includes installation of code compliant fire alarm systems. 28 campus buildings still have no fire alarm systems.</p> <p>VHMAC recommended combining the three actions into a general university wide action item.</p>	





Virginia Mine Mapping System	
Mitigation Action HC-10	
2010 Mitigation Action H-13	
<p>The Virginia Mine Mapping System is a database catalogue and geographic information system that serves as a highly effective tool for visualizing and analyzing underground mine workings that are keyed to specific coal beds in a spatially geo-referenced framework. Using the high spatial resolution of stratigraphic information contained in 30,000 mine maps and over 6,000 geophysical well logs from the Southwest Virginia Coalfields, DMME will digitize and integrate this information to improve the elevation control on the underground mine extents. These improvements will enable the database to serve as a tool for reducing the risks associated with living or working near abandoned underground coal mines.</p>	
BACKGROUND INFORMATION	
<b>Cost Benefit:</b>	Not Determined
MITIGATION ACTION DETAILS	
<b>Hazard(s) Addressed:</b>	Human-Caused, Karst
<b>Goal(s) Addressed:</b>	3
<b>Category(s) Addressed:</b>	6,7
<b>Priority (High, Medium, Low):</b>	Low
<b>Estimated Cost:</b>	\$600,000
<b>Potential Funding Sources:</b>	Not determined
<b>Lead Agency/Responsible Department:</b>	DMME
<b>Implementation Schedule:</b>	As Funding Becomes Available
<b>Current Status:</b>	<b>In Progress</b>
ADDITIONAL COMMENTS	
<p>DMME continues to scan and geo-reference coal mine maps as they become available. Through a National Coal Resource grant, DMME is also adding to the database of coal thicknesses and elevations in southwest Virginia. DMME has also scanned several hundred geophysical logs through the National Geologic and Geophysical Data Preservation grant program. Placement of these layers into an accurate three-dimensional model is still needed. The agency is actively seeking funding to continue this project.</p>	







<b>Statewide Inventory of Abandoned Mines and Quarries</b>	
<b>Mitigation Action HC-11</b>	
2010 Mitigation Action H-16	
<p>Abandoned mines and quarries in many parts of Virginia have not been accurately located or assessed for hazard potential. A thorough inventory is needed to prioritize reclamation activities aimed at mitigating risks to citizens. Complete a statewide inventory of abandoned mining sites and provide location and hazard information to emergency planners and responders and other interested parties in a GIS-based information delivery system.</p>	
<b>BACKGROUND INFORMATION</b>	
<b>Cost Benefit:</b>	Not Determined
<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Human Caused
<b>Goal(s) Addressed:</b>	3
<b>Category(s) Addressed:</b>	6,7
<b>Priority (High, Medium, Low):</b>	Low
<b>Estimated Cost:</b>	\$975,000
<b>Potential Funding Sources:</b>	Not Determined
<b>Lead Agency/Responsible Department:</b>	DMME
<b>Implementation Schedule:</b>	As Funding Becomes Available
<b>Current Status:</b>	<b>In Progress</b>
<b>ADDITIONAL COMMENTS</b>	
<p>DMME has recorded a partial inventory of abandoned mines in the Commonwealth, but the inventory is not complete. Not all abandoned mines have been thoroughly cataloged, and some of the locations of mines in the existing inventory are of questionable accuracy, as they were located before the agency began using GPS technology. Not all sites have been assessed for their risk to public safety. This work continues with one grant-funded staff person, but the work will take decades at this rate and with this level of resources. The agency continues to seek sources of external funding to complete this work.</p>	





<b>Newsletter to Virginia Food Industry on Food Security</b>	
<b>Mitigation Action HC-12</b>	
Mitigation Action O-10	
The Food Safety and Security Program, Office of Dairy and Foods, will continue to distribute a bi-annual newsletter to Virginia’s food industry. The newsletter addresses issues that should be helpful for the food industry to develop protocols for providing protection of food supply against terrorists	
<b>BACKGROUND INFORMATION</b>	
<b>Cost Benefit:</b>	Not Determined
<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Human-Caused
<b>Goal(s) Addressed:</b>	4
<b>Category(s) Addressed:</b>	6
<b>Priority (High, Medium, Low):</b>	Low
<b>Estimated Cost:</b>	Not Determined
<b>Potential Funding Sources:</b>	Agency Funds
<b>Lead Agency/Responsible Department:</b>	VDACS
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>Not Started</b>
<b>ADDITIONAL COMMENTS</b>	
The newsletter is currently inactive and is not being sent out to the industry. The position responsible for creating and disseminating the newsletter is vacant and there is no one to produce and distribute the newsletter. We plan to resume creating and disseminating the newsletter to the industry if and/or when we are allowed to fill the position.	





<b>Relocation of VDOF – Big Stone Gap Office</b>	
<b>Mitigation Action CL-1</b>	
2010 Mitigation Action S-9	
Relocate the VDOF county office facility in Big Stone Gap, VA. To avoid the problems of recurring flood damage.	
<b>BACKGROUND INFORMATION</b>	
<b>Cost Benefit:</b>	Not Determined
<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Goal(s) Addressed:</b>	1
<b>Category(s) Addressed:</b>	2
<b>Priority (High, Medium, Low):</b>	Medium
<b>Estimated Cost:</b>	Not Determined
<b>Potential Funding Sources:</b>	HMA Funds
<b>Lead Agency/Responsible Department:</b>	VDOF
<b>Implementation Schedule:</b>	As Funding Becomes Available
<b>Current Status:</b>	<b>Canceled</b>
<b>ADDITIONAL COMMENTS</b>	
VDOF has decided that this project is no longer a priority.	





<b>PDC Regional Hazard Mitigation Plan Implementation and Maintenance</b>	
<b>Mitigation Action CL-2</b>	
2010 Mitigation Action P-5	
<p>Planning District Commissions are responsible for developing and maintaining regional hazard mitigation plans. Funds are needed for implementation and maintenance of the regional plans on an annual, ongoing basis to ensure ongoing collaboration and cooperation at the regional level; there is currently no set aside funding available.</p>	
<b>BACKGROUND INFORMATION</b>	
<b>Cost Benefit:</b>	Not Determined
<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	All
<b>Goal(s) Addressed:</b>	2
<b>Category(s) Addressed:</b>	1,2,3,4,5,6,7
<b>Priority (High, Medium, Low):</b>	Low
<b>Estimated Cost:</b>	\$30,000
<b>Potential Funding Sources:</b>	Not Determined
<b>Lead Agency/Responsible Department:</b>	VAPDC
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>Canceled</b>
<b>ADDITIONAL COMMENTS</b>	
<p>Since there is no known funding source available for annual updates, this action item has been removed from the plan. VDEM will continue to provide technical assistance to PDCs and assist with applying for grants for FEMA required 5 year updates.</p>	





<b>Identify a Number of Specific Facilities that can be Designated as “All Hazard” Reception Shelter Centers</b>	
<b>Mitigation Action CL-3</b>	
2010 Mitigation Action P-8	
Identifying a number of specific facilities that can be designated as “all hazard” reception shelter centers throughout the Commonwealth near major traveled routes where citizens can seek shelter and/or get information on the nearest shelter facility. An MOU will be developed between the local jurisdiction and VDEM.	
<b>BACKGROUND INFORMATION</b>	
<b>Cost Benefit:</b>	Not Determined
<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	All
<b>Goal(s) Addressed:</b>	2
<b>Category(s) Addressed:</b>	5,6
<b>Priority (High, Medium, Low):</b>	High
<b>Estimated Cost:</b>	Not Determined
<b>Potential Funding Sources:</b>	Not Determined
<b>Lead Agency/Responsible Department:</b>	Not Determined
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>Canceled</b>
<b>ADDITIONAL COMMENTS</b>	
This action item was developed back in 2004, and after discussions with VDEM and VDSS it was determine that this project should be removed from the plan. The language involved in the action is not identifiable by either VDEM or VDSS.	





Comprehensive State Facility Inventory Database:	
Mitigation Action CL-4	
2010 Mitigation Action H-2	
<p>Enhance and consolidate the existing state facility databases into a single database. Issues to address would be types of facilities to include and the data to collect on each to meet the needs of the respective parties to this effort. Develop and implement the database, including implementation of strategies to have state agencies be responsible for maintaining their own data.</p>	
BACKGROUND INFORMATION	
<b>Cost Benefit:</b>	Not Determined
MITIGATION ACTION DETAILS	
<b>Hazard(s) Addressed:</b>	All
<b>Goal(s) Addressed:</b>	3
<b>Category(s) Addressed:</b>	1
<b>Priority (High, Medium, Low):</b>	Low
<b>Estimated Cost:</b>	Not Determined
<b>Potential Funding Sources:</b>	Agency Funds
<b>Lead Agency/Responsible Department:</b>	
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>Canceled</b>
ADDITIONAL COMMENTS	
<p>It has been determined to be more appropriate to merge this action item, into item MH-23.</p>	





Updated Repetitive Loss List to Account for Mitigated Properties	
Mitigation Action CL-5	
2010 Mitigation Action H-11	
As properties are mitigated in the Commonwealth, make sure that AW501 forms are submitted to FEMA so that the properties are removed from the repetitive loss and severe repetitive loss lists.	
BACKGROUND INFORMATION	
<b>Cost Benefit:</b>	Not Determined
MITIGATION ACTION DETAILS	
<b>Hazard(s) Addressed:</b>	Flood
<b>Goal(s) Addressed:</b>	3
<b>Category(s) Addressed:</b>	7
<b>Priority (High, Medium, Low):</b>	Low
<b>Estimated Cost:</b>	Not Determined
<b>Potential Funding Sources:</b>	Agency Funds
<b>Lead Agency/Responsible Department:</b>	VDEM
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>Canceled– Merged with FL-16</b>
ADDITIONAL COMMENTS	
Submitting AW501 forms have become a standard process in HMA closeout SOPs.	





<b>Forestry Data</b>	
<b>Mitigation Action CL-6</b>	
2010 Mitigation Action H-17	
<p>DOF has historical damages of timber and structures due to wildfire in the same dataset. VDEM will work with DOF to obtain a dataset that has timber damage and structural damage separated out for the next revision of the HIRA. This information will also be helpful in conducting Benefit Cost Analysis for wildfire mitigation projects in the Commonwealth.</p>	
<b>BACKGROUND INFORMATION</b>	
<b>Cost Benefit:</b>	Not Determined
<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Wildfire
<b>Goal(s) Addressed:</b>	3
<b>Category(s) Addressed:</b>	7
<b>Priority (High, Medium, Low):</b>	Low
<b>Estimated Cost:</b>	Not Determined
<b>Potential Funding Sources:</b>	Not Determined
<b>Lead Agency/Responsible Department:</b>	VDEM, DOF
<b>Implementation Schedule:</b>	Ongoing
<b>Current Status:</b>	<b>Canceled</b>
<b>ADDITIONAL COMMENTS</b>	
<p>It was determined that the data that VDOF was providing was adequate for the state HIRA.</p>	

