

**AN ORDINANCE PERTAINING TO THE ADOPTION OF THE COVE POINT
COMMUNITY FLOOD MITIGATION PLAN**

WHEREAS, pursuant to the authority in Title 3 of the *Land Use Article* of the Maryland Annotated Code, as amended, the Board of County Commissioners of Calvert County, Maryland (hereinafter the "Board") has general powers to promulgate and amend planning documents;

WHEREAS, by Ordinance 28-11, the Board of County Commissioners of Calvert County, Maryland adopted the Calvert County Flood Mitigation Plan, which called for the creation of the Cove Point Community Flood Mitigation Plan; and

WHEREAS, after study and evaluation, the Calvert County Department of Community Planning & Building recommended to the Planning Commission and the Board of County Commissioners a Draft Cove Point Community Flood Mitigation Plan;

WHEREAS, after due notice was published, the Planning Commission of Calvert County, Maryland (hereinafter, the "Planning Commission") conducted a public hearing on August 20, 2014, at which time the proposed plan was discussed, staff's recommendations were considered, and public comment was solicited;

WHEREAS, at the conclusion of said public hearing the Planning Commission voted to approve the adoption of the Cove Point Community Flood Mitigation Plan and conveyed its recommendation to the Board of County Commissioners by resolution;

WHEREAS, after due notice was published, the Board of County Commissioner of Calvert County, Maryland conducted a public hearing on September 23, 2014, at which time the proposed plan was discussed, staff's and the Planning Commission's recommendations were considered, and public comment was solicited; and

WHEREAS, after considering the testimony presented at the public hearing regarding the Draft Cove Point Community Flood Mitigation Plan and the recommendation of the Planning Commission, and in furtherance of the public health, safety and welfare, the Board of County Commissioners of Calvert County, Maryland determined it is in the best interest of the citizens of the County to adopt the Cove Point Community Flood Mitigation Plan as set forth in Exhibit A, attached hereto and made a part hereof.

NOW, THEREFORE, BE IT ORDAINED by the Board of County Commissioners of Calvert County, Maryland, the Cove Point Community Flood Mitigation Plan **BE**, and hereby **IS**, adopted as shown in attached Exhibit A hereto and made a part hereof.

BE IT FURTHER ORDAINED by the Board of County Commissioners of Calvert County, Maryland that, in the event any portion of this Plan is found to be unconstitutional, illegal, null or void, it is the intent of the Board of County Commissioners to sever only the invalid portion or provision, and that the remainder of the Plan shall be valid.

BE IT FURTHER ORDAINED by the Board of County Commissioners of Calvert County, Maryland that the foregoing recitals are adopted as if fully rewritten herein.

BE IT FURTHER ORDAINED by the Board of County Commissioners of Calvert County, Maryland that this plan shall be effective upon recordation.

DONE, this 23rd day of September 2014 by the Board of County Commissioners of Calvert County, Maryland.

Aye: 5
Nay: 0
Absent/Abstain: 0

ATTEST:

BOARD OF COUNTY
COMMISSIONERS OF CALVERT
COUNTY, MARYLAND

Maureen L. Frederick
Maureen L. Frederick, Clerk

Pat Nutter
Pat Nutter, President

Approved for legal
sufficiency by:

Steven R. Weems
Steven R. Weems, Vice-President

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Received for Record October 1 2014
at 11:12 o'clock A M. Same day
recorded in Liber KPS No. 45
File 496 COUNTY COMMISSIONERS
MINUTES AND RESOLUTION.

John P. Smith

BK 000456498

Attachment A

Cove Point Community Flood Mitigation Plan

September 23, 2014



NA12NOS4190169 from the Office of Ocean and Coastal Resource Management (OCRM), National Oceanic and Atmospheric Administration (NOAA), and through the Maryland Department of Natural Resources Chesapeake and Coastal Program. The statements, findings, conclusions and recommendations are those of the author and do not necessarily reflect the views of NOAA or the U.S. Department of Commerce.



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Acronyms

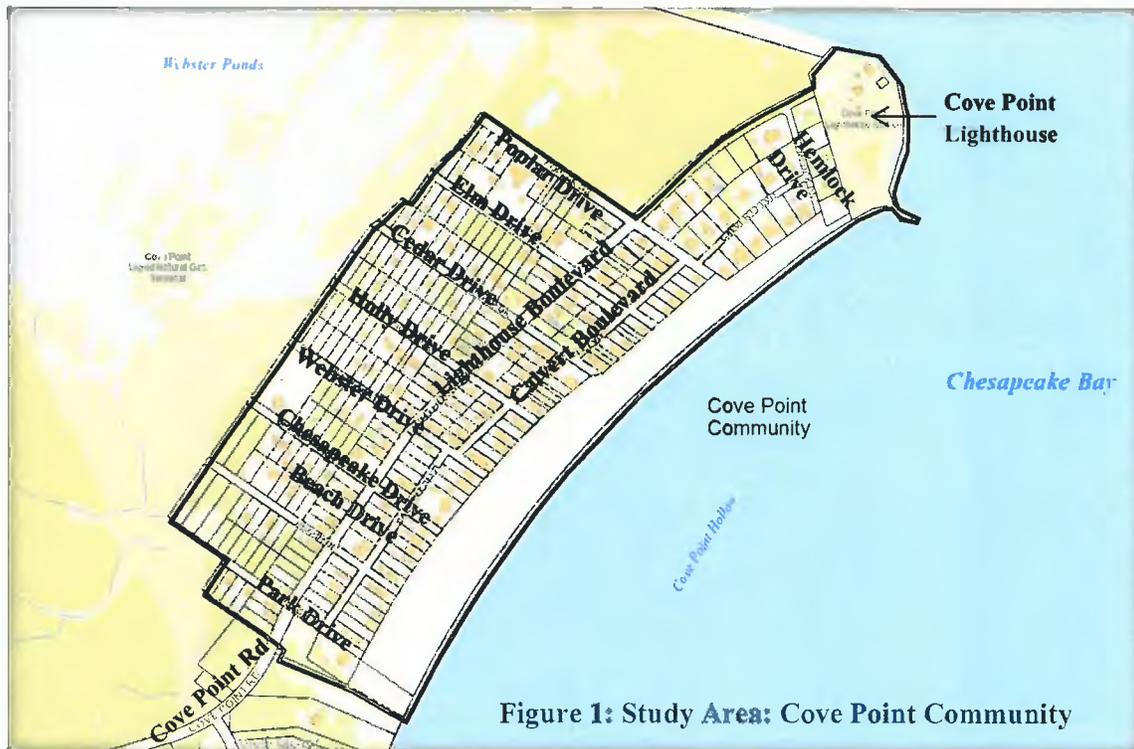
BFE – Base Flood Elevation
BNR - Biological Nutrient Removal
BRF - Bay Restoration Fund
CCZO - Calvert County Zoning Ordinance
CFM - Certified Flood Manager
CBRS - Coastal Barrier Resources System
CPB - Calvert County Department of Community Planning and Building
CPB ES - Calvert County Department of Community Planning and Building Environmental Section
CCI - Maryland Department of Natural Resources Chesapeake and Coastal Communities Initiative Grant Program
CPCFMP - Cove Point Community Flood Mitigation Plan
DNR - Maryland Department of Natural Resources
DPW EMD - Department of Public Works, Emergency Management Division
ENR - Enhanced Nutrient Reduction
FEMA - Federal Emergency Management Agency
FIRM - Flood Insurance Rate Map
FMP - Flood Mitigation Plan
GIS - Geographic Information Systems
IBC - International Building Code
IRC - International Residential Code
MDE - Maryland Department of the Environment
MEMA - Maryland Emergency Management Agency
NFIP - National Floodplain Insurance Program
NHA - Natural Heritage Area
NOAA - National Oceanic and Atmospheric Administration
OCRM - Office of Ocean and Coastal Resource Management
RTE - rare, threatened or endangered species
SFE - Safe Flood Elevation
USACE - U.S. Army Corps of Engineers
WWTP - wastewater treatment plant

Background

Calvert County adopted its first countywide Flood Mitigation Plan (FMP) in 2011. The purpose of the FMP is:

To develop a flood mitigation plan to improve Calvert County and its municipalities' resistance to floods by identifying actions to reduce the impact of floods to county residents and structures.¹

The countywide FMP recommends that the County develop a flood mitigation plan for the Cove Point Community (Figure 1: Study Area: Cove Point Community).² The adoption of this Cove Point Community Flood Mitigation Plan (CPCFMP) completes that action. The Cove Point Community has been singled out for this effort because it is the County's most flood prone community and has the most structures of any community that are vulnerable to flooding and property damage.³



¹ Calvert County Flood Mitigation Plan, p.5

² Calvert County Flood Mitigation Plan, Action 5b, p.71

³ Calvert County Flood Mitigation Plan, p.25

Located on the southeastern shore of the County, north of Solomons, Cove Point Community abuts the Chesapeake Bay to its east and south, the Cove Point Marsh to its north and the Cove of Calvert Subdivision to the west. The Community is almost completely in the 100-year floodplain. The community lies within the AE zone (Figure 2: 100-Year Floodplain of Cove Point Community).⁴ According to the countywide FMP, of the estimated 175 residential structures in the community, 166 structures⁵ have the potential to flood, and many do during heavy rainfall events.⁶ According to the Calvert County Flood Mitigation Plan, 85 percent of the structures are flood prone:

The Cove Point neighborhood will potentially be one of the most impacted during a coastal 100-year flood event. Nearly all structures in the area may suffer flooding damage to their buildings and contents. Many are likely to be impacted significantly or severely. The Cove Point community was built on a sand spit created by long shore transport of sediment from north to south along the Calvert County shoreline. Behind the spit, a shallow bay has formed. The residents who are located along this back Bay have reported flooding from rainfall runoff as well as astronomical tides. Combined with the precarious position of the community with regard to the Chesapeake Bay, many of the structures have low or no appreciable foundations, adding to their vulnerability. Finally, it is well known that periodic flooding events often cover the road leading into the community, cutting residents off from access to emergency vehicles and medical care.



⁴ At the time of the preparation of this plan, the FIRMs dated March 29, 2013 were going through the approval process. The County anticipates the floodplain data obtained from these maps will be adopted by FEMA in the fall of 2014.

⁵ Calvert County Flood Mitigation Plan, p. 25.

⁶ Calvert County Flood Mitigation Plan, p. 19.

Cove Point Community Flood Mitigation Plan Purpose and Objectives

The purpose of the CPCFMP is:

To develop a flood mitigation plan to improve the Cove Point Community's resistance to flooding by identifying actions that reduce flood impacts to residents and structures.

The objectives of the CPCFMP are to:

- Identify flood issues specific to the Cove Point Community
- Identify options to address flood issues and safety concerns due to flooding
- Make recommendations on mitigation measures to address flood issues specific to the Cove Point Community
- Identify existing and potential funding sources to assist property owners in mitigation efforts in the Cove Point Community
- Serve as a planning tool in securing funds and addressing flood issues in the Cove Point Community

Planning Process

On May 18, 2013, the Calvert County Department of Community Planning and Building (CPB) held a public meeting in Lusby, MD to discuss Cove Point Community flood issues. A facilitator was hired. Forty-four residents of the community attended. In addition, CPB coordinated with the U.S. Army Corps of Engineers (USACE) to conduct elevation assessments of Cove Point Community homes. After obtaining permission from homeowners, USACE conducted 74 elevation assessments, including an elevation assessment at the entrance of the community (where Cove Point Road meets Lighthouse Road). The elevation assessments were conducted in February and June of 2013.

Utilizing information gathered at the May 18th meeting, data from the elevation assessments, consultations with County staff, and findings contained within the Calvert County FMP, the CPCFMP was prepared between June and December of 2013. After receiving direction from the Board of County Commissioners of Calvert County on the draft CPCFMP, CPB solicited comments from the Calvert County Planning Commission, county agencies, residents, the Maryland Department of Natural Resources (DNR), the Maryland Department of the Environment (MDE), and the Maryland Emergency Management Agency (MEMA). Comments were incorporated into the CPCFMP from January through May of 2014. A public hearing is being held before the Planning Commission on Wednesday, May 21, 2014; and before the Board of County Commissioners on Tuesday, June 20, 2014.

Funding for the CPCFMP was provided through the Office of Ocean and Coastal Resource Management (OCRM), National Oceanic and Atmospheric Administration (NOAA, Grant # NA11NOS4190151), and administered through the Maryland Department of Natural Resources Chesapeake and Coastal Communities Initiative (CCI) Grant Program.

Cove Point Community Flood Mitigation Plan Participants

The CPCFMP was a collaborative effort involving Cove Point Community residents, Dominion Cove Point LNG, LP (Dominion) and local, state and federal agencies. Participants included:

- Cove Point Community residents
- Calvert County
 - CPB, Environmental Section (CPB ES)
 - Department of Public Works, Emergency Management Division (DPW EMD)
- Dominion
- Maryland Emergency Management Agency (MEMA)
- Federal Emergency Management Agency (FEMA)
- U.S. Army Corps of Engineers (USACE)
- University of Maryland



Historic Photo of the Cove Point Lighthouse
 Source: www.lighthousefriends.com

Study Area

The Study Area is the Cove Point Community (Figure 1). However, the CPCFMP also looks beyond the Study Area to examine the role of adjacent areas in contributing to flooding in the community.

Cove Point Community (Figure 1) is home to the historical Cove Point Lighthouse, which was constructed in the 1820s to serve ship traffic in the Chesapeake Bay. It was the first structure in the Community. The presence of the lighthouse, the proximity to the Chesapeake Bay with beachfront property encouraged further development of the community.

The development of Cove Point Community originally consisted of weekend vacationers living in urban areas such as Washington, DC and Baltimore. Housing generally consists of small bungalows built in the 1930s, 1940s, 1950s, and 1960s. Over the years some property owners have located to the Cove Point Community permanently, creating a community mixed with year round residents, seasonal residents and

renters. The lighthouse was fully automated in 1986 and the light keeper's house is now owned by the County and managed by the Calvert County Marine Museum, a County entity. The house serves as a rental property for vacationers and a special events venue.

Cove Point Community Current Conditions

The topography of the Cove Point Community is flat. Land elevations range from approximately 2 to 4 feet above sea level throughout most of the community, with a handful of spots elevated at 5+ feet. The current FEMA Flood Insurance Rate Maps (FIRMs) were effective on July 18, 2011 and recognized in the Calvert County Zoning Ordinance on December 16, 2011. Go to

<http://calvertgis.co.cal.md.us/Geoblade/floodplain.htm> to

verify a property's flood zone based on these maps. Since then, FEMA has conducted a Coastal Study for Calvert County and has published preliminary FIRMs dated March 29, 2013 based on the Coastal Study (Figure 2). The revised FIRMs should become effective in October 2014. The existing and Preliminary FIRMs can be viewed on the FEMA website: <http://maps.riskmap3.com/MD/Calvert>. The following discussion is based on the preliminary FIRMs.



Almost all of the community is located in the AE Zone. The AE Zone is the 100-year floodplain with established base flood elevations (BFEs). The BFE is 4 feet for the majority of the structures in the Cove Point Community; 6 feet in the northwestern portion of Cove Point Marsh and 5 feet within the southeastern section of Cove Point Marsh. Portions of the Cove Point Community at the northern ends of Beach Drive, Chesapeake Drive and Cedar Drive have a BFE of 5 ft. Most of the shoreline of the Cove Point Community and a small area adjacent to Cove Point Marsh has a new Limit of Moderate Wave Action (LiMWA) designation. LiMWA represents the approximate landward limit of the 1.5-foot breaking wave. However, there are no structures in the LiMWA except for the Cove Point Light House and a few associated structures. If questions arise about the County's Flood Management Program, contact CPB's Certified Flood Manager (CFM) at 410.535.1600 ext. 2238.

Additionally, Cove Point Marsh is a fresh water marsh, owned by Dominion and designated by the federal government as a Coastal Barrier Resources System (CBRS) and by DNR as a Natural Heritage Area (NHA). CBRS designation prohibits federal subsidies including flood insurance for any structures built or disturbances made in a CBRS designated area. A NHA designation signifies the presence of endangered animal and/or plant species, and requires a Habitat Protection Plan if disturbance is proposed. A Habitat Protection Plan was prepared by Dominion and approved by the Natural Heritage Division of DNR, and the Critical Area Commission for the shore erosion control structure placed by Dominion along the shoreline of the Cove Point Marsh. The entire community, with the exception of a few properties, is located in the Chesapeake Bay Critical Area and must comply with the Critical Area's Limited Development Area overlay zone requirements. Conventional zoning for the Cove Point Community is

Residential District, allowing for residential development mixed with public buildings, schools, churches, public recreational facilities and accessory uses. The community is mostly built out with limited opportunities for infill development. The community is located in the State of Maryland's 12-digit watershed named Gray's Creek, though it drains directly to the Bay and Cove Point Marsh.

Depending upon tidal actions and wind patterns, flood levels can fluctuate. If the tide is going out and the winds are blowing in a southeasterly direction, flood waters tend to be less severe and less destructive compared to when the tide is coming in and winds are blowing in a northwesterly direction. Flood waters come from Cove Point Marsh rather than the Bay under the latter scenario. Conversely, when winds are blowing in a northeasterly direction and the tide is coming in, flood waters mostly come from the Bay and flood waters are higher along the coast. According to residents, water coming from the Cove Point Marsh side (western portion of the Cove Point Community) often floods the entrance of the community during heavy rain events.

The Cove Point Marsh was originally a freshwater marsh that included many rare, threatened or endangered(RTE) species. However, the beach was breached in 2006 by a nor'easter, which caused the marsh to become brackish. Due to the change in the water salinity, many of the RTE plant species died off. Dominion restored the Cove Point Marsh to its freshwater status by building a shore erosion control structure along the beach in 2009. The structure included a 2,500 foot long revetment to the north fitted with flood control valves and a segmented breakwater to the south to provide habitat for the endangered nor'easter beach tiger beetle. The flood control valves provide a relief mechanism to release water back into the Chesapeake Bay when freshwater levels are high and prevent salt water intrusion when tides are high. Cove Point Community citizens have recognized a reduction in flooding since these flood valves were installed even though flooding still occurs during heavy rain events. In addition, behind the revetment, dredged material placement created approximately 3.8 acres of upland, beach/dune habitat which was planted with native dune vegetation.

See Figure 3: Cove Point Marsh Revetment Site for a schematic and for the revetment location.



Conceptual model of revetment and dredge material placement area.



Figure 3: Cove Point Marsh Revetment Site

Cove Point Community Flooding History

Over the years, the Cove Point Community has been periodically impacted by storms, hurricanes and nor'easters. In October of 1954, Hurricane Hazel impacted the Solomons area, including the Cove Point Community. Tides ranged from 6 to 8 feet higher than normal. In 1955, Hurricane Connie dumped 9.5 inches of rain on the County and caused above normal tides, resulting in flooding of structures throughout the County including the Cove Point Community. In 1985, a severe thunderstorm caused rain, high wind and high tides, flooding the Cove Point Community. In 1998, a nor'easter caused tides 3 to 4 feet higher than normal in the Solomons area, including the Cove Point Community. In 2003, Hurricane Isabel caused a storm surge of 5 to 9 feet above normal tide, inundating the Cove Point Community.⁷

Cove Point Community Flooding Sources and Vulnerability Assessment

Contributing Factors

Predominate contributors to Cove Point Community's flooding vulnerability include:

- Approximately 85% of Cove Point Community's homes were built prior to the implementation of flood regulations in 1984;
- Composition of the land – sandy soils/sand spit;
- High water table; and
- Land elevation - approximately 2 to 4 feet above sea level with a few isolated spots out of the 100-year floodplain

Most homes were built prior to the adoption of floodplain regulations. Of the approximately 175 structures in Cove Point Community, 166 structures are at risk for flooding. Tax assessment data shows that only 15% of Cove Point homes were built after implementation of floodplain regulations.

Cove Point Community sits on a sand spit. High water tables and little differential between land elevation and sea level are characteristics of sand spits due to the nature of how a sand spit is formed. A sand spit is created along a shore when wave action hits the shore at an oblique angle, trapping the sand and forming the sand spit. The Cove Point Community, sitting on a sand spit nestled between Cove Point Marsh and the Bay with relatively little elevation differential between land and sea level, and a high water table, lends itself to increased flooding vulnerability.

⁷ Calvert Flood Management Plan, 2011, p. 25.

Vulnerability Assessment

USACE conducted elevation assessments on 75 (approximately 42%^d) of the Cove Point Community residential structures. The assessments were conducted in February and June of 2013. The County requested residents give USACE permission to access their properties to conduct the elevation assessments. USACE conducted elevation assessments for residents expressing an interest, including many property owners of the community’s oldest homes. See Figure 4: Cove Point Community Elevation Assessment Inventory to identify participating structures.



Figure 4: Cove Point Community Elevation Assessment Inventory

The BFE for most of the community is 4 feet. Of the 75 houses assessed, 23 structures have lowest openings (door or vent) below the 4 foot BFE. Of these 23 structures, 18 have first floors below the 4 foot BFE. The remaining assessed structures have lowest openings and first floors above the 4 foot BFE. Historical flood trends and personal accounts indicate that most homes and accessory structures flood during heavy storm events and that the community’s entrance floods after most heavy rains. According to the Calvert County FMP, the community’s vulnerability assessment indicates many structures are likely to flood during a storm. See Table 1: County Flood Mitigation Vulnerability Assessment of the Cove Point Community.

Table 1: County Flood Mitigation Plan Vulnerability Assessment of the Cove Point Community

<i>Number of Structures</i>	<i>Predicted Structure Damage</i>	<i>% of Total Structures</i>
4	0%-10%	3
105	11%-25%	33
55	26% to 50%	63
2	51% to 76%	1

Source: Flood Mitigation Plan, Calvert County, Maryland, August 2, 2011, p.26.

Repetitive Loss Properties

According to FEMA's most recent data, 7 properties in the Cove Point Community are repetitive loss properties. Repetitive loss properties are insurable properties for which owners have submitted two or more claims to FEMA and for which the National Floodplain Insurance Program (NFIP) has paid \$1,000 to the homeowner within a 10-year period since 1978. Of the 7 properties, all but one has been elevated. However, the elevated structures do not comply with the County's recently (December 2011) adopted floodplain regulations requiring 2 foot freeboard. Most structures have only 1 foot of freeboard. Freeboard is a factor of safety usually expressed in feet above a flood level for purposes of development in the floodplain. "Freeboard" tends to compensate for the many unknown factors that could contribute to flood heights greater than the height calculated for a selected size flood, such as wave action.

Sea Level Rise⁸

Sea level rise combined with subsidence is increasingly impacting Maryland's low-lying infrastructure and structures, both public and privately-owned; and critical habitat through elevated storm surges, coastal flooding, higher tides, shoreline erosion, and other coastal hazards. Sea level rise in the Mid-Atlantic Region, including Maryland, has risen three times faster than the worldwide average during the past two decades. According to the Scientific and Technical Working Group of the Maryland Commission on Climate Change, in a report, "Updating Maryland's Sea Level Rise Projections," contributing to this above average sea level increase is the gradual sinking of Maryland's coastal plain and the recent slowing of the offshore Gulf Stream. 2050 projections call for planners to accommodate a 2.1 foot increase in sea level. This 2.1 foot increase is at the top of the projected range of 0.9 to 2.1 feet. The 2100 projection is 3.7 feet, the middle of the projected range of 2.1 to 5.7 feet. The prediction for 2100 is less reliable because it goes further out into the future and incorporates more variables.

While these figures represent the middle to top of the range projected increases in sea level rise, the report calls it "prudent" to plan for the top of the range increases. If a structure is to be useful into the 22nd century, then planners should account for a 5.7 foot sea level increase. As for higher tides, the report estimates that a 3 foot increase in sea level could produce an increase of 8 inches in the tidal range in the Upper Bay and at the heads of some tidal rivers. Tidal range is the vertical distance between high and low tides. The need to acknowledge and plan for sea level rise is critical when maintaining the viability and investment in public infrastructure and privately owned structures.

In this vein, the Cove Point Community was invited to attend a study run by Beth Olsen, a doctoral candidate at the University of Maryland. Beth Olsen and her team worked with residents using Geographic Information Systems (GIS) technology and the most up-to-date flood data available to explore three flood risk scenarios: (1) historic flooding; (2) future risk; and (3) worst case scenario 50 years out. The study was designed to determine if people are more willing to purchase flood insurance if

⁸ Source: <http://www.mdsg.umd.edu/news/scientists-unveil-new-projections-sea-level-rise-maryland>.

they have visual aids showing higher flood waters and sea level rise 50 years out versus people who have no visual aids. To measure the effect of GIS visual aid had on residents, Beth Olsen and her team held a meeting with Broomes Island residents the night after the Cove Point meeting. At this meeting, GIS visual aids were not used. The results of the study are not yet available, but are expected to yield the conclusion that using visual aids can help citizens understand the physicality of seal level rise implications.

Table 2: Sea Level Rise Predictions & Recommended Elevations for Cove Point Community Structures

<i>Year</i>	<i>Minimum Sea Level Rise Projection (feet)</i>	<i>Average Sea Level Rise Projection (feet)</i>	<i>Maximum Sea Level Rise Projection (feet)</i>	<i>Minimum* Recommended Elevation (feet)</i>	<i>Maximum* Recommended Elevation (feet)</i>
2050	0.9	1.5	2.1	6.9	8.1
2100	2.1	3.7	5.7	8.1	11.7

**Includes a 4 foot BFE, which is the BFE for most of the Cove Point Community.*

Nearly all of Cove Point Community structures are in the 100-year floodplain area. The BFE for most of the community is 4 feet. Adding the 2 foot freeboard Calvert County Zoning Ordinance requirement, and accounting for the ranges of predicted sea level rise, in 2050 the best case scenario shows that most structures in the AE Zone should have their first floor elevated to a minimum elevation of 6.9 feet (0.9 feet + 4 feet + 2 feet). The worst case scenario would require a structure’s first floor to be elevated to an elevation of at least 8.1 feet (2.1 feet + 4 feet + 2 feet) in 2050. According to 2100 sea level rise projections, the minimum first floor elevation would be 8.1 feet (2.1 feet + 4 feet + 2 feet) and the worst case scenario would require the first floor to be elevated to at least 11.7 foot (5.7 feet + 4 feet + 2 feet) elevation to implement adequate flood mitigation measures. As studies are more refined over time and sea level rise predictions become more reliable, the recommended elevation is subject to change. See Table 2: Sea Level Rise Projections & Recommended Elevations for Cove Point Community Structures. Structures that meet the current required 2 foot freeboard should be safe from a 100-yr flood until near 2050 but not in 2100. At some point in time, the BFEs or the freeboard will have to be increased.



Cove Point Home - Flooded

Cove Point Community Residents' Ranked Flooding Concerns

At the May 18, 2013 public meeting, residents identified and prioritized flood-related issues, which were recorded by a professional facilitator (See Table 3 below).

Table 3: Cove Point Community Residents' Ranked Concerns

<i>Table 3: Ranked Concerns of Cove Point Community Residents</i>	<i>Points Given by Residents</i>
#1 Dominion applies for water and sewer service, Dominion should pay the costs of water and sewer infrastructure to the Cove Point Community	283
#2 Gross and individual cost estimates for water and sewer infrastructure	264
#3 Provisions of public water and sewer to the Cove Point Community	262
#4 Grants to assist in funding flood mitigation activities such as elevation of structures	254
#5 Failing septic systems and salt water intrusion into wells	241
#6 County regulatory measures that protect citizens from industry including water quality, health, flooding	221
#7 Stormwater management requirements for the Dominion Cove Point, LNG facility	214
#8 Raising the entrance at Park Drive and Lighthouse Blvd to address flooding so that residents/emergency medical services have access into and out of the community	202
#9 Increasing flood insurance rates	201
#10 How/when should a house be elevated?	170
#11 What are the options to address beach erosion?	161
#12 Can every homeowner afford to elevate their homes and institute other mitigation measures?	146
#13 How can a house on a slab be elevated?	122
#14 Will the raising of Lighthouse Blvd worsen flooding?	115
#15 Much information presented at the May 18 th meeting is the same information presented 3 years ago. Why has little been done in the past 3 years?	111

Responses to Ranked Flooding Concerns of the Cove Point Community

#1 If Dominion applies for water and sewer service, Dominion should pay the costs of water and sewer infrastructure to the Cove Point Community. The County anticipates that Dominion will request water and sewer service as part of its current expansion project. The County will insure that the water main line and a sewer main line to Dominion's entrance are sized appropriately to accommodate Cove Point Community demand. A stub-out would be provided at Dominion's entrance for potential connection to the Cove Point Community (See Figure 5).

Sewer service could be accomplished by installing a sewer line from existing County infrastructure to the Cove Point Community. It is expected that the sewer line would be a "denied access line," which means only existing Cove Point Community homes and certain vacant lots (see below) would be permitted to connect to the sewer line. Vacant lots in the Cove Point Community could be allowed to connect to the sewer line, but likely only if the property receives an approved percolation test from the Calvert County Health Department demonstrating that a septic system could be installed and function properly on site. In addition to a sewer main line, a pump station(s) would be needed to serve the neighborhood. Water provisions would be accomplished by installing a water line from existing County infrastructure to the Cove Point Community. A pump station may also need to be installed. Adequate public water and sewer infrastructure needs and costs need to be studied and identified. The County estimates that pump station costs are approximately \$250,000 - \$500,000 per pump station. Further, there is a sewer hook-up fee of \$5,400 per home and a water connection fee of \$3,000 per home.

Sewer infrastructure costs may be paid for by Cove Point Community property owners and/or the Bay Restoration Fund (BRF). BRF monies are governed by regulations that, presently, make funds available to connect homes experiencing failing septic systems to an Enhanced Nutrient Reduction (ENR) wastewater treatment plant (WWTP). The failing septic systems must be located in a Priority Funding Area or Rural Village. Cove Point Community is a Rural Village. The Solomons WWTP is not an ENR facility; but rather, it operates at Biological Nutrient Removal (BNR) capabilities in conjunction with land application. The County is seeking BRF financial support for upgrades to ENR at the Solomons WWTP to ENR capabilities. If the Solomons WWTP is upgraded to ENR standards, then the County could apply for BRF support to connect the community to the Solomons WWTP. Financing options offered to Cove Point property owners include a sewer special tax district offered through the County, where criteria would be established for assessing each property's share of the sewer infrastructure and paid for over the term of a loan. Connection costs are not included but these may be paid for through the BRF if the Solomons WWTP is upgraded to ENR standards and MDE approves the grant request. Water infrastructure costs may be paid for by Cove Point property owners or through a Maryland Department of Public Works grant, if approved. The County is ready to assist the community in researching and developing a water and sewer special tax district agreement. It is anticipated that this will be an option for the Cove Point Community when financing water infrastructure costs, excluding connection costs. A financing option for both sewer and water connections is MDE's Revolving Loan Fund. Click the link to review the program:

http://www.mde.maryland.gov/programs/Water/QualityFinancing/WaterQualityRevolvingFund/Pages/Programs/WaterPrograms/Water_Quality_Finance/Water_Quality_Fund/index.aspx

#2 Gross and individual cost estimates for providing water and sewer service. See response to concern #1.

#3 Provisions of public water and sewer to the Cove Point Community. See response to concern #1.

#4 Grants to assist in funding flood mitigation activities such as elevation of homes. MEMA offers pre-disaster grants under its Hazard Mitigation Assistance Unified Guidance which includes the Hazard Mitigation Grant Program, Pre-Disaster Mitigation program, Repetitive Flood Claims and Severe Repetitive Loss program. FEMA recently revised its eligibility criteria, which deems housing valued under \$170,000.00 eligible for Pre-Disaster Grant Assistance. The grant is a matching grant, requiring a non-federal/local 25% match to FEMA’s 75% contribution. Assistance for elevating houses requires the property owner to incur costs of an appraisal before FEMA is able to conduct a cost/benefit analysis. The cost of the appraisal would qualify as part of the 25% matching local funds. In addition, the property owner must obtain three cost estimates, and is required to select the lowest bid. Note: grant awards are typically given to a locality up to a year after the award of grant funds. Therefore, there is a chance, assuming continuing inflation, that the estimated costs for mitigation measures will be less than actual costs, requiring the property owners to pay more out of pocket expenses than originally budgeted through the application process. See Table 4 for a summary of FEMA’s grant assistance⁹ below.

Table 4: Eligible Activities Under FEMA’s Hazard Mitigation Assistance Program	HMGP	PDM	FMA	RFC	SRL
Mitigation Projects					
Property Acquisition and Structure Demolition	✓	✓	✓	✓	✓
Property Acquisition and Structure Relocation	✓	✓	✓	✓	✓
Structure Elevation	✓	✓	✓	✓	✓
Mitigation Reconstruction	✓				
Dry Floodproofing of Historic Residential Structures	✓	✓	✓	✓	✓
Dry Floodproofing of Non-residential Structures	✓	✓	✓	✓	
Minor Localized Flood Reduction Projects	✓	✓	✓	✓	✓
Structural Retrofitting of Existing Buildings	✓	✓			
Non-structural Retrofitting of Existing Buildings and Facilities	✓	✓			
Safe Room Construction	✓	✓			
Infrastructure Retrofit	✓	✓			
Soil Stabilization	✓	✓			
Wildfire Mitigation	✓	✓			
Post-Disaster Code Enforcement	✓				
5% Initiative Projects	✓				

⁹For more information regarding these programs, go to FEMA’s Hazard Mitigation webpage: <http://www.fema.gov/hazard-mitigation-assistance>.

#5 Failing septic systems and salt water intrusion into wells. See response to concern #1.

#6 County regulatory measures that protect citizens from industry including water quality, health, and flooding. Development in the county must comply with Calvert County's Zoning Ordinance including environmental regulations.

#7 Stormwater management requirements for the Dominion Cove Point, LNG facility. Dominion recently received approval for its NPDES Permit, effective January 1, 2013. An Industrial Stormwater Pollution Prevention Plan (SWPPP) has been implemented and operational as of June 2013. Copper, oil and grease, iron and pH levels are being monitored and must meet water quality standards by October 1, 2013. A nutrient reduction goal to reduce nutrients by 25% by December 31, 2015 is also stipulated in the permit. Finally, University of Maryland's Chesapeake Biological Laboratory will continue its monitoring of salinity and water levels at Cove Point Marsh. Dominion is in compliance with permit requirements.

#8 Raising the entrance at Park Drive and Lighthouse Boulevard to address flooding so that residents/emergency medical services have access into and out of the community. If Park Drive and Lighthouse Boulevard were elevated, managing the stormwater run-off would be a challenge. A drainage ditch adjacent to the roadway would not be an adequate stormwater management measure. The combination of sandy soils and a high water table will contribute to a drainage ditch's eventual and inevitable failure. Several years ago the County installed a drainage ditch along the south side of Lighthouse Boulevard that was 3 feet wide and 3 feet deep, accompanied by an 18 inch pipe for water storage. The drain worked for two to three years, but due to the fact that Cove Point is a sand spit, located in the floodplain and next to a tidal marsh, the drain failed/filled. The drainage ditch adjacent to the Cove Point Marsh has also failed due to the same reasons. Culverts under the road are also not an option because they are likely to become clogged and become a maintenance issue or fail. Clogged culverts could worsen flooding. Therefore, elevating the road may alleviate flooding at the community's entrance, but it will likely cause drainage and flooding issues in other areas of the neighborhood, potentially exacerbating existing flooding.

#9 Increasing flood insurance rates. Under the approval of the Board of County Commissioners made on October 30, 2013 the County is currently applying for enrollment in FEMA's Community Rating System (CRS). CRS is a voluntary program that encourages communities to exceed National Flood Insurance Program (NFIP) requirements and (1) reduce flood damage to insurable property; (2) strengthen and support the insurance aspects of the NFIP; and (3) encourage a comprehensive approach to floodplain management. The CRS uses a class rating system of 10 to 1. A class 10 rating means a community is not enrolled in CRS. A class 9 rating equates to a 5% discount to individual flood insurance premiums. An additional 5% reduction is achieved for every subsequent lower class rating. Therefore, a class 8 rating equates to a 10% reduction in individual flood insurance premiums; a class 7 rating equates to a 15% reduction in individual flood premiums, and so on. The County anticipates CRS application approval in the fall/winter of 2014. The County is anticipating a class rank of at least an 8, equating to an estimated

average savings of \$145 per policy premium in the 100-year floodplain and \$69 outside of the 100-year floodplain.¹⁰

Additional Concerns Identified by Cove Point Community Residents But Not Included in the Ranked Responses Above

Additional concerns identified by Cove Point Community residents are presented below to capture and address the concerns of citizens beyond those concerns that made the ranked list.

- **During heavy rainfall events, Cove Point Marsh is inundated by stormwater from Dominion.** The recently installed flood valves by Dominion at the north end of the marsh will allow high waters to escape through the valves. See Figure 5: Adjacent Uses to the Cove Point Community, which includes the Dominion facility and Cove Point Marsh. Flooding from the marsh side of Cove Point could also be due to Bay water breaching the marsh barriers during storms.
- **Cove of Calvert's drainage pipe backs up into Cove Point (Cove of Calvert is a neighborhood located southwest of Cove Point).** According to County records, the pipes located in Cove of Calvert subdivision were extended approximately 2 years ago, alleviating the flooding problem.
- **Septic systems fail due to the fact that the community sits on a sand bar; and flooding washes waste into the Bay.** See response to concerns #1.
- **Flooding occurs along the western, or "marsh" side of the community.** There is a drainage ditch along the marsh and adjacent to the community. Residents believe this drainage ditch is not working properly. See response to concern #8.
- **Some residents believe Dominion is polluting the Cove Point Marsh.** See response to concern #7.
- **The CPCFMP will never get implemented and resources will not be allocated to implement the plan.** The implementation of the CPCFMP is reliant upon funding sources. Towards implementing of the CPCFMP, the County suggested that Dominion provide water and sewer infrastructure to the plant that is adequately sized to accommodate the Cove Point Community; and the County is working with FEMA to facilitate grant funding to Cove Point Community residents for elevation and/or acquisition measures. The adoption of the CPCFMP and the recommendations contained within this plan enhance CPB's ability to seek state and/or private funds, grants, loans and/or establish a tax district to fund County water and sewer infrastructure lines that may allow for connection to the Cove Point Community and to the Solomons WWTP for treatment; and fund pump station(s) to serve the Cove Point Community.

¹⁰ Source: CRS "What if scenario" provided by MEMA on 11/1/13.

- **Well depths are increasing due to the aquifers.** Public water provisions could address increasing well depths. See response to concern #1.



- **Make Dominion permit approvals contingent upon flood mitigation measures for Cove Point.** See response to concern #1.
- **The County allows Dominion to get away with more than they should and it is negatively impacting the environment and the Cove Point Community.** See responses to concerns #6 and #7.

In addition, the CPB handed out surveys for the residents to complete. Through the survey, questions were asked by residents. Below is a question-response sequence to address these questions.

Q: Does FEMA provide free well tests?

A: No, FEMA does not conduct free well tests. To have a well test performed, contact the MD Health Department serving Calvert County. Contact information is as follows: <http://www.calverthealth.org/community/environmentalhealthservices/wellwater.htm>; or PO Box 980, Prince Frederick, MD 20678, 410.535.3922. The Health Department conducts testing for ecoli and total coliforms normally. The Health Department application costs \$90.00; an additional fee of \$41.00 is paid directly to the state lab. For a listing of state certified private laboratories, visit the Maryland Department of Mental Health and Hygiene web site at: www.dhmv.state.md.us/labs/html/WtrCrt/watercert.htm. A private lab may also conduct testing.

For a list of what to test in your well as per the CDC, go to the link:
<http://www.cdc.gov/healthywater/drinking/private/wells/testing.html>.

Q: Why sell development rights to FEMA instead of a land preservation management entity?

A: FEMA does not regulate development rights. Rather, FEMA regulates development activities within the floodplain through the National Flood Insurance Program (NFIP). NFIP requires structures to meet certain standards to prevent flood waters from harming humans and personal property. Such standards include but are not limited to elevation of the structure, elevation of electrical and plumbing equipment, venting requirements, etc.

Calvert County has an Agricultural Preservation Program to protect farm and forest land and includes a transfer of development rights program that transfers development rights from the Farm and Forest District to other zoning districts. The program is administered under the Department of Community Planning and Building (follow this link:
<http://www.co.cal.md.us/index.aspx?NID=542>) for more information.

Q: Will grant monies be made available for elevating homes?

A: The Maryland Emergency Management Agency (MEMA) with County assistance held a meeting on January 28, 2014 including Cove Point Community residents about applying for a FEMA Hazard Mitigation grant to elevate or demolish structures in the flood hazard area. Applications for grant assistance were submitted to MEMA on February 28, 2014. See response to concern #4.

Q: Does FEMA's money pay for elevating houses before or after a flooding event?

A: As discussed above, FEMA's grant assistance program provides funds to property owners who have experienced flood damages due to natural disasters, and also provides grants for pre-disaster mitigation measures. For more information regarding FEMA's grant assistance program, click the link: <http://www.fema.gov/hazard-mitigation-assistance>. See response #4.

Q: If a homeowner wants to elevate their home, does the elevation need to be a certain height?

A: Yes, the structure will need to be a certain height, or Safe Flood Elevation (SFE). The SFE is 2 feet above BFE. In the AE Zone, SFE is measured at the top of the bottom floor; For example, if a property lies in the AE Zone and the BFE is 4 feet, then the "top of bottom floor" needs to be elevated to 6 feet (an additional 2 feet to comply with the County's 2 foot freeboard requirement). If the BFE is 5 feet, then the "top of bottom floor" needs to be elevated to 7 feet. Contact the County's Floodplain Manager to obtain this information specific to your property at 410.535.1600 ext. 2238 and/or go to Calvert County's Floodplain Management webpage: <http://www.co.cal.md.us/index.aspx?NID=554>.

Q: Is a "new above ground" septic system required?

A: The new above ground septic system, also referred to as a mound system, is required if poor soils and a high water table exist on site. The County's Health Department conducts an evaluation of

these two factors. Typically, in the Cove Point Community, replacement systems must be mound systems, but that determination is made on a case by case basis.

Q: Why get a new septic system through the Bay Restoration Fund if sewer service may come to Cove Point Community?

A: Septic systems in Cove Point have a high failure rate due to the poor soils, high water table and flooding. All failed septic systems in the Critical Area (Cove Point lays entirely within the Critical Area) require replacement with nitrogen reducing septic systems or connection to a waste water treatment plant. Extending water and sewer service to the Cove Point Community, if it occurs, could be several years in the future. Funding is the most significant issue impeding progress. Until there is an identifiable timeframe for construction of water and sewer infrastructure to the Cove Point Community, seeking a replacement septic system through the BRF is wise from a public health and environmental stand point.

Q: If water and sewer service provisions are provided to Cove Point Community residents, does every resident have to connect?

A; If public sewer is provided to the Cove Point Community, the sewer line would be a “denied access line,” which means only existing Cove Point Community homes would be permitted to connect to the sewer line. All vacant lots on the Cove Point Community would be allowed to connect to the sewer line if the property receives an approved percolation test from the Calvert County Health Department demonstrating that a septic system could be installed and function properly on site. For public water, the County encourages connection to the public infrastructure.

Q: If there were no plan, would there be no FEMA grant monies?

A: FEMA grant monies are available to property owners whose property has flooded during a natural event, and/or if the property qualifies for pre-disaster grant funding. The CPCFMP’s existence does not negatively impact a property owner’s eligibility to receive FEMA’s grant assistance, but may enhance the possibility.

Q: Will county residents receive more compensation than non-county residents? AND Concerning the CRS application and the potential for lowering residents’ premiums, if the homeowner is not a resident/the house in Cove Point is a second home; will the premiums be reduced even if the primary residence is in another county?

A: CRS reduction on rates and grant assistance is based upon the location of the insured property (among other factors), not the location of the property owner’s primary residence. County residents and non-county residents/secondary home property owners receive the same opportunity for FEMA’s grant assistance and the same rate reduction under the CRS Application process.

Q: Who decides what will ultimately be implemented?

A: The Board of County Commissioners, with a recommendation from the Planning Commission, ultimately decides on adoption of the CPCFMP. County staff prepares the plan with input from

residents, local and state agencies and the federal government. County staff can also make recommendations for funding aspects of the plans during the County's annual budget and capital improvement process. The Board of County Commissioners approves the budget.

Q: How do you find out your well depth?

A: Contact the Calvert County Health Department to have them perform a depth test at <http://www.calverthealth.org/> or 410.535.3922.

Existing Regulatory Measures

Most of the Cove Point Community is developed and has been for decades; thus limiting the effectiveness of preventative measures such as the County's Floodplain Ordinance and building codes. However, there are a handful of vacant lots that may be developable; and if existing structures are improved and the improvements equal more than 50% of the structure's fair market value, then the improvements and existing structure must meet Calvert County Zoning Ordinance (CCZO) and code regulations. In 2011, the County updated its floodplain regulations to be consistent with NFIP, which includes a 2-foot freeboard recommendation. Below is a summary (which may not be exhaustive) of regulations that serve to prevent or minimize impacts to the 100-floodplain:

- Articles 5 of the CCZO – Floodplains are encouraged in “conservation open space designations.” §5-201.E.5.a.3.iii
- Article 7 of the CCZO - 10-foot setback adjacent to 100-year floodplain areas. §7-1.06.C.2.
- Articles 8 of the CCZO – Critical Area regulations require expansion of the Critical Area 100-foot buffer to include hydric soils which often occur in the 100-year floodplain if the hydric soils are contiguous to the 100 foot buffer. This is required of other areas such as wetlands, steep slopes, highly erodible soils. §8-1.08.D.2.
- Article 8-2.03 of the CCZO - Adoption of State Model Floodplain Ordinance, including but not limited to a 2-foot freeboard requirement; avoidance of impacts to floodplain areas unless it is an



Cove Point Lighthouse

Source: <http://www.calvertmarinemuseum.com/>

unavoidable road or driveway crossing and/or stormwater management practice; limitations on fill to elevate structures, elevation requirements for the structures and utilities, vent requirements in basements, etc.

- 2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control– Calvert’s local Soil Conservation District reviews all development proposals disturbing 5,000 square feet or more for impacts to floodplains – prohibiting impacts, and if absolutely necessary, minimizing the impacts. Under no circumstances can fill or excavated sediment/soils be stored in the floodplain.
- Stormwater Management Ordinance - Prohibits outfalls in floodplains (§ 123-4 of the Calvert County Storm Water Ordinance- CCSWO); and requires control for 2-year and 10-year frequency storm events to minimize imp-acts on floodplains downstream (§ - 123-10.A.2 of the CCSWO).
- Building Codes – The International Building Code (IBC) and the International Residential Code (IRC) set the standards for building codes in the County.
- Flood Insurance Rate Maps and Flood Insurance Studies, updated and approved in December of 2011. FEMA has made revisions to the 2011 maps. The County has reviewed these revisions and sent comments to FEMA. The County has received comments back from FEMA and has scheduled a public meeting in January 2014.

Additionally, state and federal analyses and plans have identified Cove Point as a coastal flood risk¹¹. Several floodplain management and flood mitigation references are given below:

- National Flood Insurance Program/Continued Compliance and Participation (<http://www.fema.gov/national-flood-insurance-program>)
- MDE’s publication, “An Assessment of Maryland’s Vulnerability” (<http://www.esrgc.org/pdf/hazus/An%20Assessment%20of%20Maryland%27s%20Vulnerability%20to%20Flooding.pdf>)
- State of Maryland Hazard Mitigation Plan (http://mema.maryland.gov/Documents/MD_HMP_Update_Complete-Public_Copy.pdf)

¹¹ MDE’s publication, “An Assessment of Maryland’s Vulnerability” (<http://www.esrgc.org/pdf/hazus/An%20Assessment%20of%20Maryland%27s%20Vulnerability%20to%20Flooding.pdf>).

Mitigation Measures

There are a number of mitigation measures that can protect properties from flooding such as property acquisition, building elevation, flood insurance, etc. For structures in the Cove Point Community, elevating structures above BFE, demolishing homes and/or purchasing flood insurance are feasible flood mitigation measures. FEMA's grant assistance, as discussed previously, provides funds for elevating homes either as a preventative measure or directly after a flood event. After Hurricane Isabel in 2003, FEMA worked with Cove Point Community residents to provide grants for property owners to mitigate their structures. One property owner demolished their home and the lot was converted to open space. With FEMA's revised eligibility criteria, most, if not all Cove Point residents, are likely to qualify for grant funds. As mentioned previously, the CPB and FEMA are working with Cove Point residents to identify grant opportunities.

Cove Point Community residents also expressed an interest in elevating Lighthouse Boulevard to address flooding at the community's entrance- where Cove Point Road (a state road) and Lighthouse Boulevard (a county road) meet. Flooding occurs here, making it impassable to emergency response vehicles and residents (discussed previously). While neither the County's Departments of Public Works nor Public Safety track road closings in their automated systems, county staff and Cove Point residents' anecdotal accounts indicate flooding occurs at the community's entrance frequently – during high tides and generally during any type of storm event. However, elevating the road is not an optimal mitigation measure. As mentioned above, if Lighthouse Boulevard were to be elevated, managing stormwater from an elevated Lighthouse Boulevard would be problematic for the same reasons the drainage ditch along the coastal side and the marsh side of Cove Point failed – sandy soils are not favorable conditions for ditches or swales, and they contribute to the eventual and inevitable filling in of a ditch. Underground storage is not an option due to sandy soils and high water table. Culverts that could be placed under the roadway are likely to clog with the frequent flooding occurrences in conjunction with the sandy soils.

Examples of Mitigation Measures



**NATIONAL FLOOD
INSURANCE PROGRAM**

Recommendations

The recommendations presented below are not in any particular order or priority.

Recommendation #1: Explore potential of providing water and sewer service to the Cove Point Community neighborhood. The County anticipates that Dominion will request water and sewer service as part of its current expansion project. The County also anticipates that the water main line and a sewer main line to Dominion's entrance will be sized appropriately to accommodate Cove Point Community demand. Sewer infrastructure costs may be paid for by Cove Point property owners and/or the Bay Restoration Fund. In addition, financing options offered to Cove Point property owners include a water and sewer tax district offered through the County; and/or MDE's Revolving Loan Fund. The Bay Restoration Fund may be able to pay for sewer connection fees, since the Solomons WWTP meets the requirements of biological nutrient removal (BNR). Water infrastructure costs may be paid for by Cove Point property owners or through a Maryland Department of Public Works grant. The County is ready to assist the community in researching and developing a water and sewer tax district agreement. It is anticipated that this policy and the MDE Revolving Loan Fund will be options for the Cove Point Community when financing water and sewer infrastructure costs, excluding connection costs.

Recommendation #2: Work with MDE to allow Bay Restoration Fund (BRF) monies to fund connections from Cove Point homes to the Solomons WWTP. Currently, MDE's policy is that BRF monies may be used to connect homes on septic system to BNR wastewater facilities.

Recommendation #3: Pursue FEMA Hazard Mitigation Assistance Grant Funds. FEMA has recently revised its criteria eligibility for its grant assistance funds. MEMA held a public meeting on January 28, 2014 to discuss opportunities to elevate homes and/or acquire homes using FEMA's Hazard Mitigation grant funds. CPB has submitted a FEMA Hazard Mitigation grant proposal to , MEMA, which includes several Cove Point Community elevation projects.