
CORRESPONDENCE AND COORDINATION APPENDIX

NORFOLK COASTAL STORM RISK MANAGEMENT FEASIBILITY STUDY

NORFOLK, VIRGINIA

APPENDIX F

October 2017



Table of Contents

Section 106 Correspondence	F-3
NEPA Scoping Public Meeting Report.....	F-22
NCSRM Study Public Information Meeting Comments.....	F-62
Executed FSCA.....	F-67
ERP Letter to the District.....	F-75

From: [Haile-McPhillips, Peggy](#)
To: [Haynes, John H Jr CIV USARMY CENAO \(US\)](#)
Subject: [Non-DoD Source] NHS participation in Programmatic Agreement
Date: Friday, June 30, 2017 4:34:05 PM

Hello John,

We received your letter today inviting representatives from Norfolk Historical Society to participate with the Corps in the Programmatic Agreement regarding the NCSRM. This is something we would very much like to do and I thank you for thinking of us.

I am sending your letter out to our board this afternoon, asking for volunteers. If volunteers are slow in coming forward, this being summertime, I have a couple of people in mind who I think would represent us knowledgeably and well.

Do you have a time frame in mind for when you would like to begin to bring people together?

Again, many thanks for including Norfolk Historical Society in this important discussion.

Peggy

Peggy McPhillips

Norfolk City Historian

Slover Library

235 E. Plume St.

Norfolk, VA 23510

757-431-7455| 757-510-3884 mobile

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From: [Haile-McPhillips, Peggy](#)
To: [Haynes, John H Jr CIV USARMY CENAO \(US\)](#)
Cc: [Anne Brockenbrough](#); [Carter B.S. Furr \(CBSFURR@att.net\)](#); [perreault3@cox.net](#)
Subject: [Non-DoD Source] NHS representatives to USACE committee
Date: Wednesday, July 05, 2017 12:06:39 PM

Hi John,

Three of our NHS board members have expressed interest (or at least willingness) in serving on the USACE Programmatic Agreement committee. Their names, phone numbers and email addresses are listed below.

Anne, Carter and Mark, many thanks for participating – we all look forward to hearing more!

Peggy

Anne Brockenbrough

578-5623; 408-3463 (cell)

[<mailto:annebrocken@gmail.com>](mailto:annebrocken@gmail.com)

Carter B.S. Furr

627-7044 (h) ; 622-2258 (w)

[<mailto:CBSFURR@att.net>](mailto:CBSFURR@att.net)

Mark Perreault

489-0772 (h)

[<mailto:perreault3@cox.net>](mailto:perreault3@cox.net)

From: [Haile-McPhillips, Peggy](#)
To: [Haynes, John H Jr CIV USARMY CENAO \(US\)](#)
Cc: [Anne Brockenbrough](#); [Carter B.S. Furr \(CBSFURR@att.net\)](#); [perreault3@cox.net](#); [Joanne Berkley](#)
Subject: [Non-DoD Source] RE: Another name from NHS for your planning group
Date: Monday, July 10, 2017 4:51:27 PM

Thanks, John!

I forwarded the council presentation. Did everyone receive?

Peggy

Peggy McPhillips
Norfolk City Historian

Slover Library
235 E. Plume St.
Norfolk, VA 23510
757-431-7455| 757-510-3884 mobile

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-----Original Message-----

From: Haynes, John H Jr CIV USARMY CENAO (US) [<mailto:John.H.Haynes@usace.army.mil>]
Sent: Monday, July 10, 2017 4:15 PM
To: Haile-McPhillips, Peggy <peggy.haile-mcphillips@norfolk.gov>
Cc: Anne Brockenbrough <annebrocken@gmail.com>; Carter B.S. Furr (CBSFURR@att.net)
<CBSFURR@att.net>; perreault3@cox.net; Joanne Berkley <secins@secins.hrcoxmail.com>
Subject: RE: Another name from NHS for your planning group

Peggy,

Thank you, I will include her in future emails. Did you forward the copy of the city council brief to the group? If not I'll send it.

R/John

-----Original Message-----

From: Haile-McPhillips, Peggy [<mailto:peggy.haile-mcphillips@norfolk.gov>]
Sent: Monday, July 10, 2017 3:38 PM
To: Haynes, John H Jr CIV USARMY CENAO (US) <John.H.Haynes@usace.army.mil>
Cc: Anne Brockenbrough <annebrocken@gmail.com>; Carter B.S. Furr (CBSFURR@att.net)
<CBSFURR@att.net>; perreault3@cox.net; Joanne Berkley <secins@secins.hrcoxmail.com>
Subject: [Non-DoD Source] Another name from NHS for your planning group

John,

I have just learned that Joanne Berkley would like to be a part of the group that works on the Programmatic Agreement for the Coastal Storm Risk Management Study. Her email has not been working, so she didn't see the

initial email I sent out asking for volunteers. Her contact information is:

Joanne Berkley

423-6033 (h); 423-4163 (2nd line);

573-1007 (c); Fax: 622-1742

secins@secins.hrcoxmail.com <<mailto:secins@secins.hrcoxmail.com>>

Until her email is back up and running, one of us will keep her updated on any communication from you, and scheduled meeting dates.

Thanks!

Peggy

Peggy McPhillips

Norfolk City Historian

Slover Library

235 E. Plume St.

Norfolk, VA 23510

757-431-7455| 757-510-3884 mobile

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From: [LaBudde, Gregory \(DHR\)](#)
To: [Perdue, Katherine S CIV CENAO CENAD \(US\)](#)
Cc: [Haynes, John H Jr CIV USARMY CENAO \(US\)](#)
Subject: [Non-DoD Source] RE: Norfolk Coastal Storm Risk Management project: Cooperating/regulatory agency meeting (DHR File No. 2017-0136)
Date: Wednesday, June 07, 2017 11:24:34 AM

Kathy,

Please accept my apologies for the slow response. At this time, I believe that coordination through the Section 106 process would be appropriate for the Norfolk Coastal Storm Risk Management project. I have briefly discussed the project with John, and it's my understanding that we will develop a Programmatic Agreement for the undertaking.

Regards,

Greg LaBudde, Archaeologist
 Review and Compliance Division
 Department of Historic Resources
 2801 Kensington Avenue
 Richmond, VA 23221
 phone: 804-482-6103
 fax: 804-367-2391
gregory.labudde@dhr.virginia.gov

-----Original Message-----

From: Perdue, Katherine S CIV CENAO CENAD (US) [<mailto:Kathy.S.Perdue@usace.army.mil>]
 Sent: Wednesday, March 22, 2017 6:46 PM
 To: LaBudde, Gregory (DHR)
 Cc: Haynes, John H Jr CIV USARMY CENAO (US)
 Subject: FW: Norfolk Coastal Storm Risk Management project: Cooperating/regulatory agency meeting

Hi Greg,

Thank you for your reply. Are you interested in being a cooperating agency, or did you want to participate strictly by coordination through the Section 106 process? As always, John will be doing the 106, so you and he can decide what is best.

Thank you,
 Kathy Perdue

-----Original Appointment-----

From: LaBudde, Gregory (DHR) [<mailto:Gregory.LaBudde@dhr.virginia.gov>]
 Sent: Tuesday, March 21, 2017 10:30 AM
 To: Perdue, Katherine S CIV CENAO CENAD (US)
 Subject: [EXTERNAL] Declined: Norfolk Coastal Storm Risk Management project: Cooperating/regulatory agency meeting
 When: Wednesday, March 29, 2017 2:30 PM-4:30 PM (UTC-05:00) Eastern Time (US & Canada).
 Where: Corps Norfolk District, second floor conference room

Unable to attend. Please keep me in mind for future consultation.

From: [LaBudde, Gregory \(DHR\)](#)
To: [Haynes, John H Jr CIV USARMY CENAO \(US\)](#)
Subject: [Non-DoD Source] RE: Initiation of Consultation on the Norfolk Coastal Storm Risk Management Project
Date: Wednesday, June 07, 2017 11:09:44 AM

John,

DHR agrees that, given the scope and diversity of the potential effects of the Norfolk Coastal Storm Risk Management project on historic properties, development of a Programmatic Agreement is appropriate for Section 106 review. For future reference, DHR File No. 2017-0136 has been assigned to the project.

Regards,

Greg LaBudde, Archaeologist
 Review and Compliance Division
 Department of Historic Resources
 2801 Kensington Avenue
 Richmond, VA 23221
 phone: 804-482-6103
 fax: 804-367-2391
 gregory.labudde@dhr.virginia.gov

-----Original Message-----

From: Haynes, John H Jr CIV USARMY CENAO (US) [<mailto:John.H.Haynes@usace.army.mil>]
 Sent: Thursday, March 30, 2017 3:43 PM
 To: LaBudde, Gregory (DHR)
 Subject: Initiation of Consultation on the Norfolk Coastal Storm Risk Management Project

Greg,

Please see the attached letter and map describing and illustrating potential measures being considered for the Norfolk Coastal Storm Risk Management project study. The project was initially termed the Norfolk Comprehensive Flood Risk Management Project, but the title was changed because flooding in Norfolk is mostly effected by storm and tide surges. The letter goes into detail about the project and approaches to Section 106. There are three stages to USACE civil works projects: Feasibility, Preconstruction Engineering and Design, and the Construction stage. We are currently in the Feasibility stage of the project. The NEPA documentation for this project will be an EIS. As always, feel free to contact me with any questions.

Regards,

John

John H. Haynes, RPA
 Archaeologist & Tribal Liaison
 US Army Corps of Engineers,
 Norfolk District (NAO)
 803 Front Street
 Norfolk, VA 23510
 757-201-7008
 fax 757-201-7646
 john.h.haynes@usace.army.mil



Preserving America's Heritage

July 19, 2017

Mr. John Haynes
US Army Corps of Engineers
Norfolk District
Fort Norfolk
803 Front Street
Norfolk, VA 23510-1096

Ref: *Proposed Programmatic Agreement for the Norfolk Coastal Storm Risk Management Study*
Norfolk, Virginia
ACHPCConnect Log Number: 011818

Dear Mr. Haynes:

On June 29, 2017, the Advisory Council on Historic Preservation (ACHP) received your notification of adverse effect and intent to develop a programmatic agreement for the referenced undertaking that was submitted in accordance with Section 800.6(a)(1) of our regulations, "Protection of Historic Properties" (36 CFR Part 800). The background documentation included with your submission does not meet the specifications in Section 800.11(e) of the ACHP's regulations. We, therefore, are unable to determine whether Appendix A of the regulations, *Criteria for Council Involvement in Reviewing Individual Section 106 Cases*, applies to this undertaking. Accordingly, we request that you submit the following additional information so that we can determine whether our participation in the consultation to resolve adverse effects and develop a programmatic agreement is warranted.

- A description of the undertaking, specifying the federal involvement, and its area of potential effects, including photographs, maps, drawings, as necessary;
- Copies or summaries of any views provided by consulting parties, the public, and the Virginia State Historic Preservation Officer.
- Copies or summaries of any views provided any by affected Indian tribe.

Upon receipt of the additional information, we will notify you within 15 days of our decision.

If you have any questions, please contact Mr. Christopher Daniel, Program Analyst at (202) 517-0223 or by email at cdaniel@achp.gov and reference the ACHPCConnect Log Number.

Sincerely,

Historic Preservation Technician
Office of Federal Agency Programs



Planning and Policy Branch

**DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NORFOLK DISTRICT
FORT NORFOLK
803 FRONT STREET
NORFOLK VA 23510-1096**

August 9, 2017

Robert Neyland
Underwater Archaeology Branch
Naval History and Heritage Command
805 Kidder Breese Street SE
Washington Navy Yard, DC 20374-5060

Dear Dr. Neyland,

In accordance with regulations pertaining to the National Historic Preservation Act (NHPA), Section 106, we invite the Naval History and Heritage Command to consult regarding the Norfolk Coastal Storm Risk Management Study (NCSR), to minimize or mitigate any adverse effects to properties listed in or eligible for the National Register of Historic Places (NRHP). The NCSR is a joint undertaking of the U.S. Army Corps of Engineers (USACE) and the City of Norfolk, Virginia.

As project alternatives, we are considering four groupings of management measures throughout the City. The alternatives may include various combinations of the following structural and nonstructural measures: tide gates/storm surge barriers, floodwalls, bulkheads, road raises, beach nourishment/dune enhancement, building retrofits, raising the spillway of a dam, property acquisitions, and enhanced flood warning planning. Natural and nature-based measures might include stormwater retention areas, living shorelines, reefs, and wetlands.

The scope and diversity of potential effects of the NCSR project, and constraints of USACE planning policy make a Programmatic Agreement (PA) for compliance with NHPA Section 106 essential. The extent, duration, and costs of archaeological surveys make it unlikely they can be fit into the Feasibility Study stage of the project. Because it is necessary to complete the EIS to compete the Feasibility Study, Section 106 must be satisfied and this can be done through a PA. Cultural resources surveys would be deferred to the Preconstruction Engineering and Design (PED) stage of the project. Finally, given the potential for hundreds of historic buildings being variously affected by the array of structural and non-structural measures, a streamlined review process for historic can be established by a PA to make Section 106 review more manageable for such a large number of cases. We invite the Naval History and Heritage Command to consult and concur with us in a PA. You may contact me at (757) 201-7008, or john.h.haynes@usace.army.mil, or the address listed in the letterhead.

Sincerely,

HAYNES.JOHN.H
.JR.1271781624

Digitally signed by
HAYNES.JOHN.H.R.1271781624
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI,
ou=USA, cn=HAYNES.JOHN.H.R.1271781624
Date: 2017.08.09 17:08:36 -04'00'

John H. Haynes, RPA
Archaeologist,
Environmental Analysis Section,
Planning and Policy Branch



Planning and Policy Branch

**DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NORFOLK DISTRICT
FORT NORFOLK
803 FRONT STREET
NORFOLK VA 23510-1096**

June 26, 2017

Brian Lusher
 Advisory Council on Historic Preservation
 Office of Federal Agency Programs
 401 F Street NW, Suite 308
 Washington, DC 20001-2637

Dear Mr. Lusher,

In accordance with regulations pertaining to the National Historic Preservation Act (NHPA), Section 106, we invite the Advisory Council on Historic Preservation to consult regarding the Norfolk Coastal Storm Risk Management Study (NCSR), to minimize or mitigate any adverse effects to properties listed in or eligible for the National Register of Historic Places (NRHP). The NCSR is a joint undertaking of the U.S. Army Corps of Engineers (USACE) and the City of Norfolk, Virginia.

As project alternatives, we are considering four groupings of management measures throughout the City. The alternatives may include various combinations of the following structural and nonstructural measures: tide gates/storm surge barriers, floodwalls, bulkheads, road raises, beach nourishment/dune enhancement, building retrofits, raising the spillway of a dam, property acquisitions, and enhanced flood warning planning. Natural and nature-based measures might include stormwater retention areas, living shorelines, reefs, and wetlands.

The scope and diversity of potential effects of the NCSR project, and constraints of USACE planning policy make a Programmatic Agreement (PA) for compliance with NHPA Section 106 essential. The extent, duration, and costs of archaeological surveys make it unlikely they can be fit into the Feasibility Study stage of the project. Because it is necessary to complete the EIS to compete the Feasibility Study, Section 106 must be satisfied and this can be done through a PA. Cultural resources surveys would be deferred to the Preconstruction Engineering and Design (PED) stage of the project. Finally, given the potential for hundreds of historic buildings being variously affected by the array of structural and non-structural measures, a streamlined review process for historic can be established by a PA to make Section 106 review more manageable for such a large number of cases. We invite the Advisory Council on Historic Preservation to consult and concur with us in a PA. You may contact me at (757) 201-7008, or john.h.haynes@usace.army.mil, or the address listed in the letterhead.

Sincerely,

John H. Haynes, RPA
 Archaeologist,
 Environmental Analysis Section,
 Planning and Policy Branch



Planning and Policy Branch

**DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NORFOLK DISTRICT
FORT NORFOLK
803 FRONT STREET
NORFOLK VA 23510-1096**

June 23, 2017

Nekole Alligood
Delaware Nation
P.O. Box 825
Anadarko, OK 73005

Dear Ms. Alligood,

In accordance with regulations pertaining to the National Historic Preservation Act (NHPA), Section 106, we invite the Delaware Nation to consult regarding the Norfolk Coastal Storm Risk Management Study (NCSR), to minimize or mitigate any adverse effects to properties listed in or eligible for the National Register of Historic Places (NRHP). The NCSR is a joint undertaking of the U.S. Army Corps of Engineers (USACE) and the City of Norfolk, Virginia.

As project alternatives, we are considering four groupings of management measures throughout the City. The alternatives may include various combinations of the following structural and nonstructural measures: tide gates/storm surge barriers, floodwalls, bulkheads, road raises, beach nourishment/dune enhancement, building retrofits, raising the spillway of a dam, property acquisitions, and enhanced flood warning planning. Natural and nature-based measures might include stormwater retention areas, living shorelines, reefs, and wetlands.

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Sincerely,

John H. Haynes, RPA
Archaeologist,
Environmental Analysis Section,
Planning and Policy Branch



Planning and Policy Branch

**DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NORFOLK DISTRICT
FORT NORFOLK
803 FRONT STREET
NORFOLK VA 23510-1096**

June 23, 2017

Susan Bachor
Delaware Tribe of Indians
P.O. Box 64
Pocono Lake, PA 18347

Dear Ms. Bachor,

In accordance with regulations pertaining to the National Historic Preservation Act (NHPA), Section 106, we invite the Delaware Tribe of Indians to consult regarding the Norfolk Coastal Storm Risk Management Study (NCSR), to minimize or mitigate any adverse effects to properties listed in or eligible for the National Register of Historic Places (NRHP). The NCSR is a joint undertaking of the U.S. Army Corps of Engineers (USACE) and the City of Norfolk, Virginia.

As project alternatives, we are considering four groupings of management measures throughout the City. The alternatives may include various combinations of the following structural and nonstructural measures: tide gates/storm surge barriers, floodwalls, bulkheads, road raises, beach nourishment/dune enhancement, building retrofits, raising the spillway of a dam, property acquisitions, and enhanced flood warning planning. Natural and nature-based measures might include stormwater retention areas, living shorelines, reefs, and wetlands.

The scope and diversity of potential effects of the NCSR project, and constraints of USACE planning policy make a Programmatic Agreement (PA) for compliance with NHPA Section 106 essential. The extent, duration, and costs of archaeological surveys make it unlikely they can be fit into the Feasibility Study stage of the project. Because it is necessary to complete the EIS to compete the Feasibility Study, Section 106 must be satisfied and this can be done through a PA. Cultural resources surveys would be deferred to the Preconstruction Engineering and Design (PED) stage of the project. Finally, given the potential for hundreds of historic buildings being variously affected by the array of structural and non-structural measures, a streamlined review process for historic can be established by a PA to make Section 106 review more manageable for such a large number of cases. We invite the Delaware Tribe of Indians to consult and concur with us in a PA. You may contact me at (757) 201-7008, or john.h.haynes@usace.army.mil, or the address listed in the letterhead.

Sincerely,

John H. Haynes, RPA
Archaeologist,
Environmental Analysis Section,
Planning and Policy Branch



Planning and Policy Branch

DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NORFOLK DISTRICT
FORT NORFOLK
803 FRONT STREET
NORFOLK VA 23510-1096

June 23, 2017

Peggy McPhillips
Norfolk Historical Society
P.O. Box 6367
Norfolk, Virginia 23508-0367

Dear Ms. McPhillips,

In accordance with regulations pertaining to the National Historic Preservation Act (NHPA), Section 106, we invite the Norfolk Historical Society to consult regarding the Norfolk Coastal Storm Risk Management Study (NCSR), to minimize or mitigate any adverse effects to properties listed in or eligible for the National Register of Historic Places (NRHP). The NCSR is a joint undertaking of the U.S. Army Corps of Engineers (USACE) and the City of Norfolk, Virginia.

As project alternatives, we are considering four groupings of management measures throughout the City. The alternatives may include various combinations of the following structural and nonstructural measures: tide gates/storm surge barriers, floodwalls, bulkheads, road raises, beach nourishment/dune enhancement, building retrofits, raising the spillway of a dam, property acquisitions, and enhanced flood warning planning. Natural and nature-based measures might include stormwater retention areas, living shorelines, reefs, and wetlands.

The scope and diversity of potential effects of the NCSR project, and constraints of USACE planning policy make a Programmatic Agreement (PA) for compliance with NHPA Section 106 essential. The extent, duration, and costs of archaeological surveys make it unlikely they can be fit into the Feasibility Study stage of the project. Because it is necessary to complete the EIS to compete the Feasibility Study, Section 106 must be satisfied and this can be done through a PA. Cultural resources surveys would be deferred to the Preconstruction Engineering and Design (PED) stage of the project. Finally, given the potential for hundreds of historic buildings being variously affected by the array of structural and non-structural measures, a streamlined review process for historic can be established by a PA to make Section 106 review more manageable for such a large number of cases. We invite the Norfolk Historical Society to consult and concur with us in a PA. You may contact me at (757) 201-7008, or john.h.haynes@usace.army.mil, or the address listed in the letterhead.

Sincerely,

John H. Haynes, RPA
Archaeologist,
Environmental Analysis Section,
Planning and Policy Branch



Planning and Policy Branch

DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NORFOLK DISTRICT
FORT NORFOLK
803 FRONT STREET
NORFOLK VA 23510-1096

June 23, 2017

Ashley Atkins-Spivey
 Pamunkey Indian Tribe
 Pamunkey Tribal Government
 191 Lay Landing Road
 King William, VA 23086-2133

Dear Ms. Atkins-Spivey,

In accordance with regulations pertaining to the National Historic Preservation Act (NHPA), Section 106, we invite the Pamunkey Indian Tribe to consult regarding the Norfolk Coastal Storm Risk Management Study (NCSRMR), to minimize or mitigate any adverse effects to properties listed in or eligible for the National Register of Historic Places (NRHP). The NCSRMR is a joint undertaking of the U.S. Army Corps of Engineers (USACE) and the City of Norfolk, Virginia.

As project alternatives, we are considering four groupings of management measures throughout the City. The alternatives may include various combinations of the following structural and nonstructural measures: tide gates/storm surge barriers, floodwalls, bulkheads, road raises, beach nourishment/dune enhancement, building retrofits, raising the spillway of a dam, property acquisitions, and enhanced flood warning planning. Natural and nature-based measures might include stormwater retention areas, living shorelines, reefs, and wetlands

The scope and diversity of potential effects of the NCSRMR project, and constraints of USACE planning policy make a Programmatic Agreement (PA) for compliance with NHPA Section 106 essential. The extent, duration, and costs of archaeological surveys make it unlikely they can be fit into the Feasibility Study stage of the project. Because it is necessary to complete the EIS to compete the Feasibility Study, Section 106 must be satisfied and this can be done through a PA. Cultural resources surveys would be deferred to the Preconstruction Engineering and Design (PED) stage of the project. Finally, given the potential for hundreds of historic buildings being variously affected by the array of structural and non-structural measures, a streamlined review process for historic can be established by a PA to make Section 106 review more manageable for such a large number of cases. We invite the Pamunkey Indian Tribe to consult and concur with us in a PA. You may contact me at (757) 201-7008, or john.h.haynes@usace.army.mil, or the address listed in the letterhead.

Sincerely,

John H. Haynes, RPA
 Archaeologist,
 Environmental Analysis Section,
 Planning and Policy Branch



17
DEPARTMENT OF THE ARMY

Reply to
Attention of

US ARMY CORPS OF ENGINEERS
NORFOLK DISTRICT
FORT NORFOLK
803 FRONT STREET
NORFOLK VA 23510-1096

March 30, 2017

Planning and Policy Branch

Mr. Greg LaBudde
Division of Review and Compliance
Virginia Department of Historic Resources
2801 Kensington Avenue
Richmond, Virginia 23221

Dear Mr. LaBudde:

In accordance with regulations pertaining to the National Historic Preservation Act (NHPA), Section 106, we would like to initiate consultation regarding the Norfolk Coastal Storm Risk Management Study (NCSRM Study), the Feasibility stage of the NCSRM project, to minimize or mitigate any adverse effects to properties listed in or eligible for the National Register of Historic Places (NRHP), also referred to as historic properties. The NCSRM is a joint undertaking of the U.S. Army Corps of Engineers (USACE) and the government of the City of Norfolk, Virginia (City).

The NCRSM Study encompasses the entire City of Norfolk, Virginia. Norfolk was evaluated within the *North Atlantic Coast Comprehensive Study (NACCS)*, which was a broad analysis spanning ten states, completed using regional data sets to produce a broad evaluation of exposure and risk. A further refined analysis, the *City of Norfolk, Virginia Coastal Storm Risk Management Integrated Strategy*, which was completed in January 2015, was a desktop analysis using more detailed critical infrastructure data sets such as hurricane evacuation shelters and light rail stations. The current focus area study represents a finer, more detailed evaluation, to include the NEPA analysis. A Notice of Intent to prepare an EIS was posted in the Federal Register on April 29, 2016; and a public scoping meeting was held on May 25, 2016 for the current study.

The CRSM Study seeks not only to reduce coastal storm risk, but also to build resilience by implementing strategic approaches that address identified stresses and potential shocks such as nuisance flooding risk, major storms, and the impact on residents and economic activity. The study includes developing and evaluating coastal storm damage risk management measures for coastal Norfolk residents, industries, and businesses which are critical to the nation's economy.

As project alternatives, we are considering four groupings of management measures throughout the City. The alternatives may include various combinations of the following structural and nonstructural measures: tide gates/storm surge barriers, floodwalls, bulkheads, road raises, beach nourishment/dune enhancement, building retrofits, raising the spillway of a dam, property acquisitions, and enhanced flood warning planning. Natural and nature-based measures might include stormwater retention areas, living shorelines, reefs, and wetlands. The

final array of alternatives may include these measures in various combinations. A Tentatively Selected Plan (TSP) will then be chosen from the final array of alternatives.

Structural measures refer to measures which divert water from broad areas. Structural measures currently being considered are tide gate/surge barriers and seawalls/levees. There are six tide gate/surge barriers under consideration, numbered on the enclosed map:

- 1) tide gate/surge barrier at the Shore Drive Bridge over Little Creek/Pretty Lake, length approximately 165 meters;
- 2) tide gate/surge barrier at the mouth of the Lafayette River, length approximately 2500 meters;
- 3) tide gate/surge barrier across the Lafayette River between Tanners Point and Larchmont, length approximately 1000 meters;
- 4) tide gate/surge barrier across the Lafayette River at Hampton Boulevard, length approximately 700 meters;
- 5) tide gate/surge barrier across the mouth of The Hague (Smith's Creek) at the Brambleton Avenue Bridge, length approximately 250 meters;
- 6) tide gate/surge barrier across Broad Creek at the light rail (Tide) bridge, length approximately 450 meters.

Of the tide gate/surge barriers considered, numbers 2, 3, and 4 would be mutually exclusive, and numbers 3, 4, and 5 would join into seawalls or levees. These have the potential to affect archaeological resources on river bottoms and on shorelines, and as well as have potential visual effects to architectural properties. Pump stations to eliminate runoff during storms may be paired with these barriers. A pump station at an existing surge barrier on Mason Creek might be installed.

Seawalls and levees are being considered as potential measures in many areas. There are approximately 42,000 meters of these linear structures currently being considered as measures in the NCSRM study. Although it is unlikely that all of that would be part of the Tentatively Selected Plan (TSP), seawalls and levees will likely play an important role in the TSP. A similar measure would raise the dam and spillway at the Lake Whitehurst reservoir to prevent contamination of this drinking water source from coastal flooding.

Natural and nature based features are being considered to augment the aforementioned structural measures. These include “living shorelines,” oyster reefs, beach dune construction, wetland creation, and storm water retention ponds. The latter two have some capacity to store rainwater, while the former would reduce risk through wave attenuation. Of these measures, stormwater retention ponds and daylighting historic waterways would be most likely to have the potential to cause effects to archaeological resources, and some living shoreline designs may involve grading bluff areas. These changes to the landscape would be visual effects, but by their nature would most likely not be considered adverse to historic properties.

Non-structural measures include a wide variety of measures which share in common that they reduce risk in ways other than diverting water over a large area. These include modifications to buildings, enhanced evacuation routes, and emergency management planning.

Modifications to buildings is the only category of non-structural measures that has the potential to cause effects to historic properties. These measures include:

- buy-out of residential buildings and demolition or conversion to non-residential use;
- relocation to less flood prone areas;
- raising the first floor of a building above a certain elevation;
- “dry-proofing” by making lower elevations of a building impervious to water;
- “wet-proofing” by sealing water out of walls even though the building might flood;
- construction of ring-walls, mini-seawalls encompassing an individual buildings.

Clearly, non-structural measures would cause effects if applied to historic properties. There are approximately 4579 (NRHP) listed, contributing to a NRHP listed historic district, NRHP eligible, potentially NRHP eligible, or contributing to a potentially NRHP eligible historic district properties in the City of Norfolk. Of these 1163 fall within Federal Emergency Management Administration identified repetitive flood loss zones. These repetitive flood loss zones have been used as a proxy for areas where non-structural measures might be applied, but in the final plan this will more likely be based on the first floor elevations of structures and other factors. It is likely that there could be hundreds of historic properties affected by non-structural measures.

The scope and diversity of potential effects of the NCSRM project, and constraints of USACE planning policy make a Programmatic Agreement (PA) for compliance with NHPA Section 106 essential. Although it has been made clear to project management that it would be desirable to have archaeological surveys done to provide information for alternative formulation and selection, and cost estimation for subsequent project stages, the extent, duration, and costs of such surveys make it unlikely they can be fit into the Feasibility Study stage of the project. Because it is necessary to complete the EIS to compete the Feasibility Study, Section 106 must be satisfied and this can be done through a PA. Completed archaeological surveys, which would include marine and urban survey areas, the latter with possible deep cultural stratigraphy, would be deferred to the Preconstruction Engineering and Design (PED) stage of the project. Although there has been extensive architectural history inventory in the City of Norfolk, it is not comprehensive and additional architectural history survey will be needed, probably deferred to the PED stage when structural measures and non-structural measure areas have been clearly defined. Finally, given the potential for hundreds of historic buildings being variously affected by the array of structural and non-structural measures, a streamlined review process for historic can be established by a PA to make Section 106 review more manageable for such a large number of cases.

Staff of the USACE and the City completed a four day planning charrette to refine and screen measures on March 23. A schedule was developed where measures will be formulated into a final array of alternatives on May 1. A public meeting on the alternatives is planned on or about June 1. The draft Feasibility Study and TSP is planned to be presented to Headquarters USACE on August 3.

We look forward to working with the Virginia Department of Historic Resources to minimize and mitigate any effects to historic properties that may result from the implementation of the NCSRM project. You may contact me at (757) 201-7008, or john.h.haynes@usace.army.mil, or the address listed in the letterhead.

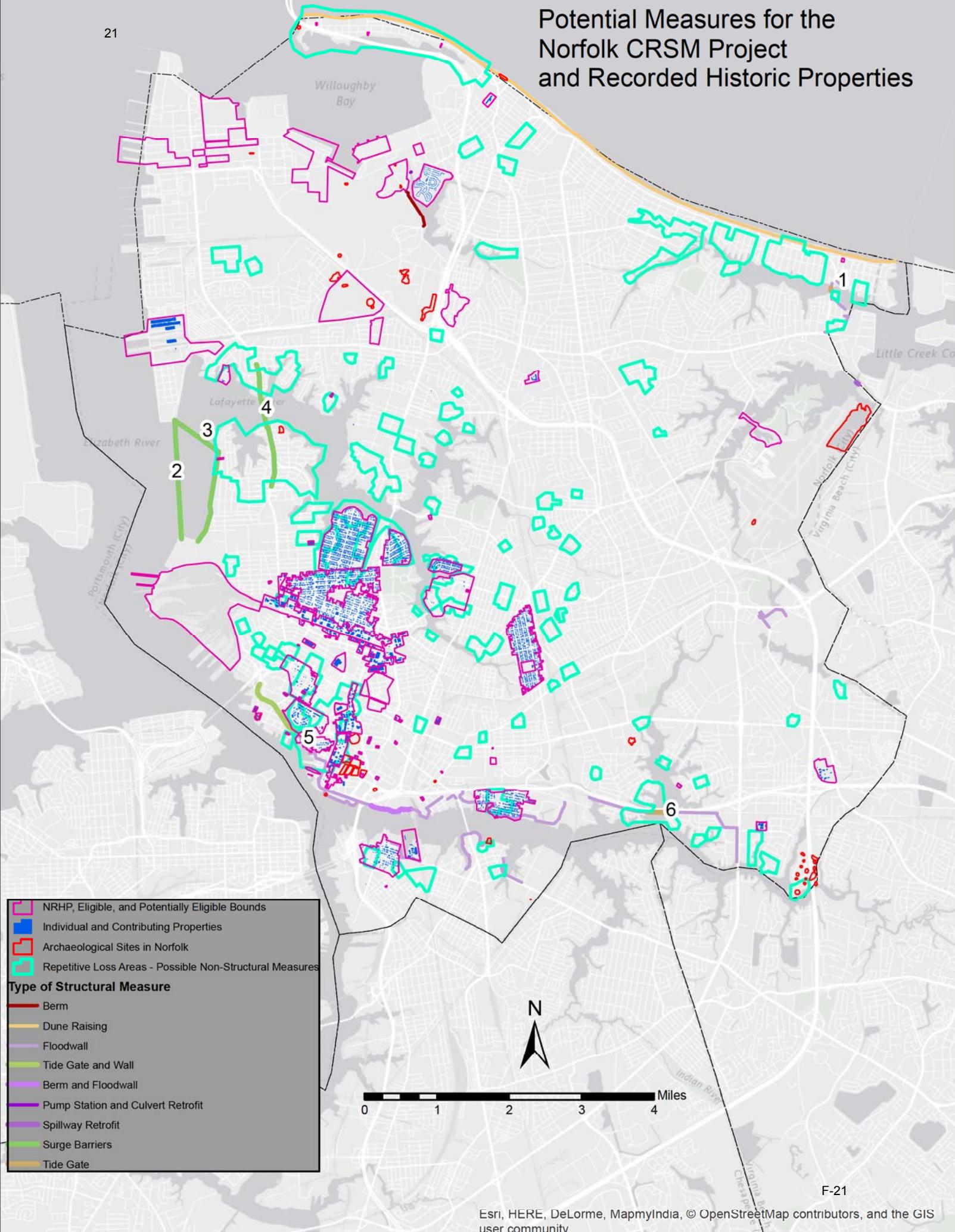
Sincerely,

HAYNES.JOHN.H
JR.1271781624
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DN: c=US, o=U.S. Government,
ou=DoD, ou=PKI, ou=USA,
cn=HAYNES.JOHN.HJR.1271781624
Date: 2017.03.30 14:24:41 -04'00'

John H. Haynes, RPA
Archaeologist,
Environmental Analysis Section,
Planning and Policy Branch

Potential Measures for the Norfolk CRSM Project and Recorded Historic Properties

21



City of Norfolk

Flood Risk Management

NEPA Scoping Report

The NEPA Scoping meeting was held on May 25, 2016 from the hours of 5 p.m. – 8 p.m. at Pretlow Public Library, 111 West Ocean Avenue, Norfolk, Virginia 23503. The format of the meeting was an informal open-house, where the public can attend any time during the meeting hours and staff from the USACE and The City of Norfolk will be available to answer questions. The purpose of the meeting is to provide the public an opportunity to learn more about the study and to solicit the public's help in identifying issues, alternatives, and potential impacts to be considered in the study. The USACE plans to prepare an Environmental Assessment to evaluate environmental impacts from reasonable project alternatives and to determine the potential for significant impacts.

BACKGROUND: Historical storms including Hurricane Sandy have impacted the City of Norfolk. In response to the storm, the U.S. Army Corps of Engineers (USACE) is investigating solutions that will reduce future flood risk in ways that support the long-term resilience and sustainability of the coastal ecosystem and surrounding communities, and reduce the economic costs and risks associated with large-scale flood and storm events. In support of this goal, USACE completed the North Atlantic Coast Comprehensive Study (NACCS) which identified nine high risk areas on the Atlantic Coast for an in-depth analysis based on preliminary analyses.

Norfolk has been identified as one of these nine areas of high risk, or Focus Areas, that warrants an in-depth investigation into potential coastal storm risk management solutions. The Norfolk Focus Area is located on the Chesapeake Bay, a location which has been identified as one of the highest risk areas for relative sea level rise in the country.

STUDY APPROACH: The City of Norfolk, VA, Flood Risk Management Study is a comprehensive investigation of flood risk management problems and solutions in the City of Norfolk. The study will consider past, current, and future flood risk management and resilience planning initiatives and projects underway by the USACE and other Federal, State, and local agencies. Three overarching efforts will be performed:

- 1) Assess the study area's problems, opportunities, and future without project conditions;
- 2) Assess the feasibility of implementing system-wide flood risk management solutions; and
- 3) If system-wide solutions are not feasible, assess the feasibility of implementing site-specific solutions, such as structural, non-structural, and natural and nature-based features, possibly in combination.

This Project Management Plan presents the scope and corresponding costs of the Norfolk FRM Study and is compliant with USACE SMART Planning policy and procedures.

Attendees listed on the sign-up sheets

1. David Roberson, 8819 Semmen Avenue, 587-3354
2. Chuck Taylor, 330 W. Brambleton Avenue, 583-4651, ctaylor131@cox.net
3. Emily Birknes, 212 Colonial Avenue, 625-3141, emily@gentva.org
4. Margo Gunter, COE
5. Ann Pettingur, 450 Westover, 622-4823, apettingpa2@gmail.com
6. Derek and Mary Nelson, 1106 Manchester Avenue, 423-1472, dereknelson558@gmail.com
7. Terri Johnson, 1848 E. Ocean View, 301-580-1026, maridaTerri@gmail.com
8. Doris Bonds, 400 canberry court, Virginia Beach, 908-456-5362, dorisbonds@gmail.com
9. Nevicle Reynolds, 5561 Town Creek Road, Gloucester, 804-695-4344, rreynoldsvhb.com
10. Ana Moran, 1004 Woronoca Avenue, Norfolk
11. Kim Miller, 1401 Doe Court, Virginia Beach, 757-817-1806, 757-817-1806, kim.miller@mothersoutfront.org
12. Murat Ozcan, 4940 Rutherford Road, Virginia Beach, 333-0642, murat@destecs.net
13. Ellen Carlson, 9620 Wells Parkway, 589-5737, ellencarlson@gmail.com
14. Andria McClellan, 531 Warren Cresent, 679-2883, andriamcclellan@gmail.com
15. Sam Furlong, 2501 Pretty Lake Avenue, Norfolk, Virginia, 793-5021, furlong.samuel@gmail.com
16. Steve G. Jones, 1530 Gilbert Street, Suite 200, Norfolk, Virginia, 322-2333, steve.g.jones@navy.mil
17. Charles Johnson, 3226 Omohundra Avenue, 292-1045, nudosccj@yahoo.com
18. Jacqueline Smalls, 1184 Holt Street, 757-768-9148
19. Sandra Keith, 1011 Charlotte Street, 201-2814
20. Steve Morales, NRHA, 201 Granby Street, 624-8646, smocakes@nrha.us
21. Robert Rea, 375 Middle Street, 309-5869, Robert.rea@axcel.us
22. Kimberly Williams, 2616 Bowdens Terry Road, Norfolk, krwilliams65@gmail.com
23. Thomas Quattlebaum, 831-392-7308, tquattlebaum@cbf.org
24. Hank Gruber, USACE, NAD, 347-452-2391
25. Paul Robeinson, 1320 Windsor Point Road, 918-3516, paulrobeinson@alr-usa.com
26. Sonya Childs, 6313 ardsley square, apartment 201 A, Virginia Beach, 965-2077, sonyachilds@cox.net
27. Carson Yotti, 201 Thornnose Avenue, Staunton, Virginia, 24401, 540-280-1790
28. Clare Reagan, 1315 Sussex Place, 423-8499
29. Rick Williams, 1612 Skyline Drive, Norfolk, Virginia, 651-5201
30. Tanterrian Taybr, 5920 Poplar Hall Drive, Norfolk, Virginia, 559-6150, sunshine_23540@yahoo.com

31. Nettie Bond, 225 Tidewater, 757-918-5725, nettiebond@gmail.com
32. Jayle Saunderline, 507 Tidewater Drive, 757-3506
33. Cathy Rothman, 215 Regent Road, 757-635-3951, crothman23@yahoo.com
34. Oralis Holland, 204 Eoy Avenue, 587-4413
35. Mason Andrews 500 Mowbray, 406-5805, mason.andrews@verizon.net
36. John Mair, 0534 Eou, 340-7035
37. John Ouellehe, 265-2903, Jouellehe@verizon.net
38. Michelle Cock, 589 Ru Housest, 372-3104, kingsofsoloman@yahoo.com
39. Chris and Diane Steele, 419 Bay Drive, 583-8457, cpsteele@ad.com
40. Joanne Baker, Wharton Avenue, 567-5355, millerrlty@aol.com
41. Johnny Boone, 1922 Edgewood Avenue, 328-8376
42. Susan Johnson, 2026 Eov, 621-8988, masbf@cox.net
43. Atiba Muse, atibamuse@icloud.com
44. Martha Graham-Mother out front, 1400 Weybure Court, 495-6907, Martha51graham@icloud.com
45. Catherine Kilduff, 537 Pembroke Avenue, Norfolk, Virginia, 530-304-7258, ckilduff@biologicaldiversity.org
46. William Sharek, 822 E. Ocean View, Norfolk, 443-370-2811, Wsharek@hotmail.com
47. David Ricks, Norfolk
48. Claudia and Jim Wade, 303 Mowbray Ach, 408-2030, jryan@clrbfirm.com
49. James Watson, 703 E. Virginia Beach Boulevard, 622-3391, norypolitical@yahoo.com
50. Marc Loutassr, 6076 Newport Point, 489-5030, mpouilar@caualiarlark.com
51. Christy Everett, 3663 Marlin Bay Drive, Virginia Beach, 622-1964, ceverett@cbf.org
52. George Homewood, City of Norfolk, 810 Union Street, 664-4770, George.homewood@norfolk.gov
53. Levern Hunt, 9611 Morwin Street Apartment #6, 735-7032, purpleblue1961@gmail.com
54. Jim McElroy, 255 W. Ocean View Avenue

USACE Employees

1. Mark Haviland
2. Eddie Durant
3. Kerry Solan
4. Doug Stamper
5. Mark Hudgins
6. Alicia Logalbo
7. Rachel Haug
8. Susan Conner
9. Jason O'Neal
10. Kathy Perdue
11. Dave Schulte

12. Michelle Hamor
13. Greg Steele
14. Faraz Ahmed

City of Norfolk

1. Katerina Oskarsson
2. Jason
3. Scott Smith
4. Bobby Tejan

Comments

Ann Pettingill, 284-8953, apettingpa1@gmail.com

I am very interested in learning more (and specially – details) about what neighborhoods/communities can do to reduce run off during storms. I live in Ghent Square – what kinds of measures could individual household's take to reduce run off? If we can identify specific, practical (and do able) actions, the community as a whole can begin to educate and encourage the residents to start trying to do something - and to learn best methods from each other.

Sandra Keith 201-2814, Nettie Bond 918-5725, Joyce Sanderline 227-3506, Tidewater Garden

- 1) Tidewater Drive – Floods with high tides and heavy rain
- 2) South Holt Street – Heavy rain – down pours
- 3) Charlotte Street – Floods when light or heavy rain plus night tides
- 4) Brambelton Ave – Floods when heavy rain plus down pours
- 5) Fenchurch Street – Over flow with water from surrounding areas

Rob Hollowell

Jetty on West side of Little Creek

- Needs a hook to the west to catch sand that migrates into Little Creek Channel.
- Prevailing Westerly's Blow sand into channel
- Would help East Beach in a storm

Joe and Clare Reagan, 1315 Sussex Place, 423-8499, joeclarereagan@gmail.com

We live in Larchmont, two blocks from Lafayette River moved in 1988. Up until about 2000, the tidal flooding came up from Surrey Crescent onto Sussex Place, across Upper Brandon, and ½ way up Sussex Place, stopping about 2 doors down from one house. After 2000 (dates approximate)

2 large homes were built in the opposite side of the inlet (in the end of Sussex Place). These were built on wetlands – required piling. After construction, the next flood event brought water down both ends of Sussex Place. The water now completely covers Sussex Place during a 7 or 8 foot above storm water event.

Bottom line: New house construction on wetlands may bring more tax revenue for the city, but it is irresponsible considering this project, which address flooding problems in Norfolk. Why can't the city look into removing homes that encroach on wetlands? Sounds bizarre, but the issue of rising sea levels is one that require looking at everything that contributes to the problem.

Ms. Michelle Cook, Tidewater Gardens, 757-372-3104, kingofsoloman@yahoo.com

Considering Emergency Shelters

- I don't know where my shelter is for was during floods.
- How do I get notified that my area needs to evacuate
- Tunnels are not really shown on the map to help me comment on this.
- If the flood gates fail, how do you get the message out? Needs to be loud and long.
- Need something more reliable than text messages.

Rick Williams, Larrymore Lawns Civic Center, 651-5201

I found the panels interesting and thought they did a good job laying out the issues and showing where things stand now and whose they are headed. In terms of observations, I noted that a lot of what I consider “critical infrastructure” is either currently subject to flooding or is expected to be so, in the future. I am thinking of Police Stations, Fire Stations, medical Facilities and Emergency Shelters. I believe priority should be given to ensuring that such critical infrastructures. Critical from a public safety standpoint, be secured (so to speak) lest we lose the ability to respond during crisis and people advised to go to a shelter (assist those who are unable to get to shelters due to flooding. What to do to alleviate flooding? Let's stipulate that these are no Silver bullets! Meaning we will very likely need to undertake a variety of fractions to address the challenge. I would suggest ranking actions by feasibility/impact and by tide line. What actions need to be taken in 5 years? 10 years? 15 years? Etc, and perhaps we can use the “Lego Principle” of Building upon what has already been done. It makes sense to consider design future actions with the “Lego Principle” in mind the better to ensure we do not waste time, effort and money. What role can the private business sector play? What actions can be taken to minimize hazardous materials going into flood waters fertilizers, gasoline set fuel, etc? Not sure these connects are that helpful! I raise more questions than offer solutions! What can I say? Everything has to be on the table improving storm drainage, raising buildings, seawall/levees, raising roads/bridges etc.

Mason Andrews, Hampton University, 406-5805, mason.andrews@verison.net

- Hope we can quickly develop and implement street-scape standards including Bio Retention and permeable sidewalks and parking lanes
- Need store house/data base of geotechnical info

- Hope demo dry swale, sub grade sterns (where soil profile appropriate) draining for groundwater recharge, buoyant self-deploying flood barriers, buoyant foundations and other fun stuff to assess utility
- Parking garages configured for water retention perhaps
- Walled water storage/rain gardens
- Fashion forward hip boots!

Ms. Tanterrian Taylor, Serria Club, 559-6150, sunshine.23504@yahoo.com

Hello!

I ask the City of Norfolk, Virginia and the US Army Corps of Engineer to please take a look at the "Sink Hole" that keeps growing in Norfolk, Va. 23502-3855 area code. I'm still try to get the Military Circle Mall to fix this problem. The address is 5870 Poplar Hall Drive. It is an empty parking lot next to Dale Train Station located at 5880 Poplar Hall Drive. Please Help!

Paul Robinson, 418-3516, paulrobinson@alv-usa.com

There does not seem to be a federally defined sea level rise hazard model to work against e.g., rise per year [ft], probabilities, etc.

1. Is this in feet the case
2. If not, does the federal government agree that this should be
3. If they do agree, which agency should do it (NOAA?) and when?

Ms. Tanterrian Taylor, Serria Club, 559-6150, sunshine.23504@yahoo.com

Hello!

My name is Ms. Tanterrian Taylor. My idea on Reducing the flooding in the City of Norfolk, Virginia.

(1) Please ask (All) companies owner if they can have the person who cut their grass to use trash cans. Please st trash down in the drainage, sewer whole on the streets.

(2) Advise Residents not to put trash (All) bags and cups on the streets. It does not hurt to put them in the trash Ghent and Willouby Area. Build up a wall! That will stop the over flow of water! Put a camera down into the (an how much trash is in the lines. And then go from that point as we can make up a new plan to handle the problem Thank you for your time!

Chris Steele, Resident, 584-8457, cpsteele@aol.com

1) Whatever the objectives of this event it would be helpful to show the public the waste plan. This helps in decisions on where to live, economic development, and comfort with the sustainability of the community.

2) OV development is dependent on a clear vision on how the beaches will be maintained. Also is there a plan to remove the visible storm water drains and improve storm water management.

Emily Birkues, Ghent Neighborhood League, 625-3141

Smith/Colley Creek Basin which flows, ultimately into the Hague.

Structural: a flood wall/gate with pumps would help tremendously

Nonstructural: an aesthetic, well thought out and planned berm/living shoreline around the Hague, up into Stockley Gardens and Botetourt Gardens.

Streets: Low points a long Mowbray Arch – in front of 528 Mowbray, near corner of Mowbray and Mill Street, all around Chrysler, South side of Hague on Dundaff.

The corner of Colonial Ave. and Warren Crescent floods quickly and does not drain. Water is stagnant. Also, lots of flooding at Mowbray and Boutetourt. The field floods (old Leigh Hospital) and all around the old apartment building on Drummond/Mowbray/Boutetourt. Another area: behind Chrysler (intersection of Olney and Virginia Beach Boulevard) people cannot get through.

Samuel Furlong, 793-5021, furlong.samuel@gmail.com

First, I think it's fantastic that the City and Federal government have provided the community a forum for asking questions and gaining insight into efforts to mitigate flooding in the City. Some recommendations for future events.

- 1) It was difficult to identify who was who. Name tags and focus area would be very helpful
- 2) A little more advertising would be great!
- 3) A website to follow process (one may exist...awareness of it does not!)

Continued education of the public will support this effort. We do care! Lower income families may not have access to mediums used to advertise events like this, and after they are the ones hardest hit by flooding. We need to find a way to get them involved as well. Thanks again!!

Ellen Carson

- 1) Breakouts by neighborhood very helpful but
- 2) Guided tour, with overview then neighborhood would have been helpful
- 3) Session was well staffed with friendly, knowledgeable folks
- 4) Recommend review of current emergency shelter locations – OV Senior Center is about to be torn down and elementary on Willowood lies very low, it seems
- 5) What protections are available for Chrysler, with all the tunnels under it?
- 6) Didn't see the Tide overlay on any map – have heard concern stops and tracks going under water
- 7) What are timeframe and budget issues?
- 8) Is there a role here for ordinary citizens?

Atiba Muse, NRDC, 804-895-0723, atibamuse@icloud.com

It is very innovative of the City of Norfolk to act responsibly regarding sea-level rise. Please add me to any e-mail list that serves as a News worthy report of daily events and community outreach.

Ana Moran, 660-473-2994, amm22276@email.vcs.edu

I am concerned about ODU area which is very flooding in Hampton Boulevard. What are the measures that are being taken in order to lessen the flooding when bad storms?

Kimberly Williams, 472-5388, krwilliams65@gmail.com

I live in Lambert's Point. During heavy rains, my street (27th and Bowdens Ferry) still floods even after storm. Driving around town, I have had trouble with high water (fast rising!) from ordinary rain storms (1) Tidewater and Princess Anne Road in the (2) Park Place neighborhood, between 27th & 26th Streets on streets near Colley Avenue, and (3) downtown in the area around NSU. I regularly experience high water in heavy rain events (non-hurricane, non-nor'easter heavy rains). I have had 2 cars damaged in 2 different storms driving home from Virginia Beach in the above named areas.

Jonn Ryan, Ghent Neigborhood League, 408-2030, jryan@clubfirm.com

- 1) We need a "sea change" in perception, that there is a problem that needs to be addressed now, and not in the wake of a catastrophe. City shall have indicated that funding is more forthcoming post catastrophe. This is unacceptable.
- 2) We need to understand and exhaust all funding sources, sufficient to undertake a large scale project or projects, and create or foster the "sea-change" in referenced in 1) above. Is there an inventory of sources? Do we know?
- 3) We need to understand and express publicly how dependent the City and region are on the tax revenues from waterfront on water-affected properties. What will a 30% drop in market value from such properties do to the inventory of sources? A real concern for all taxpayers. 30% is not a scientific percentage, merely an estimate.
- 4) Further to 2. Above, Annapolis seems to understand better than we historic preservation/Department of Interior Funding. Smart, Nuanced, Creative.
- 5) There is no, zip, zilch commitment on part of City to fund permanent flood remediation, as far as I can tell. Why are we not socking money away now, and thus planning to execute when plans form. We need to be ready.
- 6) Leadership is needed to explain the value of hardening city agreement flooding.

7) Sending dump trucks around on storm days, to me, is a testament to governmental ineffectiveness.

8) The Hague, also known as the Smith/Colley Creek basin, is surrounded by a bulkhead and supporting structures that are in disrepair. The portion of the bulkhead under North facing side of Water side adjacent to Brambleton Ave. Bridge, case in point. This area needs attention regardless of flooding. This area, generally, is one of the most beautiful in Norfolk. Hundreds of our citizens enjoy the Hague area daily and they don't live there. Residents go on the streets to fireworks and watched every year. Races run through in the neighborhood several times a year. Young folks adorn the bridge with their locks. Doctors crucial to Sentara make it their homes. Students at EUMS live there. This area in Ghent has historically been a haven for open-minded culturally diverse citizens in Norfolk. This neighborhood can't the city and the federal government daily in the redevelopment, and not just money cost. It was a terribly difficult thing, the demolition of many lower income homes in New Ghent, and the vicinity. That settled down (through it still resonates with many in the City) and the neighborhood has become a "Cash Cow" for the City, State, and federal government, made hell of a place to live. Was all that strife, and wish (both governmental and few people like my parents who moved to Ghent in the 60's), and distrust, for NOTHING? Preserve the value of perhaps the greatest, get most different, redevelopment and success in City history.

Robert Rea, Axcel Innovation, 305-5869, Robert.rea@excel.us

Trying to evaluate proposed actions and alternatives in seven zones and 18 impact areas is not workable. How can you possibly, reach a preferred alternative? And how can you explain it at a public meeting? Perhaps you could use classes of actions, such as floodgates, relocations, buffer zones, vegetation. With the alternatives being different combinations for the entire study area. I have experience in doing EA's and EIS's, including conducting public meetings, and would welcome the opportunity to help sort it out.

William W. Fleming, 1324 Five Point Road, Virginia Beach, Virginia, wwfleming@hotmail.com, 481-0484

Regarding the USACE Norfolk Flood Risk Management study, I would like to make the following comments and recommendations:

My first comment is that I feel that hard gray barriers (dykes) should be replaced with wide triangular "soft" barriers that have a base of a minimum of $\frac{1}{4}$ mile wide by 10 to 15 feet high. In some cases these soft barriers can be wider. The side of this triangular barrier facing the water should be an engineered wetland that incorporates natural wetland features including oyster reefs at the shore, wetland grasses, wetland shrubs, and transition trees which would occupy the summit and inland slope of the barrier. If such a soft barrier is $\frac{1}{4}$ mile wide and 10 feet tall isosceles triangle, the grade of the water side would be 1:66. If the soft barrier is $\frac{1}{2}$ mile wide isosceles triangle, the grade of the water side would be 1:132.

The use of a wide soft barrier will provide the benefits of energy attenuating wetlands, soil strengthening root structures, and wind attenuating trees. In residential areas where structures are currently within the footprint of such as soft barrier, some existing structures could be elevated and incorporated into the general cross-section of the soft barrier. In other cases, the local zoning might be changed to prevent future residential and commercial structures from being built in this soft barrier buffer.

The development of a soft barrier structure can be incorporated into other threatened areas in Hampton Roads including Virginia Beach, Norfolk, Hampton, and Newport News, as well as the Eastern Shore. By establishing a continuous integrated band of soft barriers, this strategy will result in a continuous regional protective band of protective buffer which can accommodate existing populations to a considerable extent while providing a basis for future rational development. Moreover, the wetland and tree components of the soft barrier will substantially improve water quality in the Chesapeake Bay and associated rivers and creeks.

My second comment is that I feel that the Corps of Engineers should look elevating the ground in the Norfolk area when future structures are built. The goal would be to change the elevation of as much of the Norfolk area to 10 to 15 feet above the current levels. For example, in the case of Norfolk Naval Base, the national security threat of flooding and sea level rise is significant because most or all of the base would be subject to flooding. If the ground level of NOB were raised 10 feet, this national security threat would be substantially mitigated. Such an endeavor would require new construction to be built based on a ground level that is 10 feet higher than current levels. Some older buildings would need to be replaced, but many of them would be due for replacement anyway.

The prospect of raising the ground level of the entirety of Norfolk would be logically difficult and very expensive. However, it would probably be more cost-effective if the residential areas near the water would be a good start. For example, if the neighborhoods along the Lafayette River were raised, they would help serve as part of the soft barrier buffer discussed in the first comment. As mentioned earlier, one of the changes of mindset will be to plan for future construction so that the ground is 10 or so feet higher than the existing elevation.

Both of the suggestions above are near-term strategies that provide long-term solutions to the regional problems of sea level rise and recurrent flooding.

Lela Smith

Hello my name is Lela Smith I am contacting you because it has come to my attention that a flood risk management study will be conducted in the City of Norfolk. As a resident of Norfolk and a marine biologist and oceanographer I am hoping some ecologically friendly methods will be evaluated and implemented. There are a few available options that will not only reduce flooding susceptibility, but also be self-sustainable, and economically viable. Several cities impacted by

Superstorm Sandy, including New York City and Point Pleasant Beach, where I grew up, are implementing ecological methods to reduce flood risk. These methods include replenishing, restoring, and establishing salt marshes and oyster reefs. I am hoping Norfolk will follow in the foot-steps of these other great cities in adopting these water and storm management options, which would not only mitigate the flood risk but would also help to clean the waters surrounding Norfolk and add to the health of the bay system.

There are several reasons to consider utilizing oyster reefs in place of sea walls. Seawalls are expensive, solid, non-adaptable structures. Due to their inability to adapt to environmental changes they are subject to being undermined over time by both passive and active erosion. The implementation of these walls would not only be costly, but would also result in immediate changes in the currents, a reduction of the aesthetical value of the land, the gradual erosion and loss of public land, and a lessening of biodiversity of the ecosystem. On the other hand, as a living structure, oyster reefs are able to adapt to the new conditions which the ocean and bay system will often present, making it a more sustainable option. These living infrastructures also filter water (approximately 50 gallons per oyster per day) as well as help to hold sediment in place, while reducing wave energy that reaches the shoreline. The result of which is an overall lessening of erosion of the shore line. Oyster beds have been proven to be highly effective at reducing wave action that reaches the shore. After Sandy, which cost New York City over 40 billion dollars, a study was conducted to see how much of the wave action of storms hitting the city would be reduced if the historical oyster beds were still in place. The results of this study was that as much as 200% reduction would occur if the beds were still there.

Another option that should be considered would be establishing and restoring the local salt marsh. The usefulness of salt marshes to reduce flood risk is highly renown. A study to quantify the effectiveness of these marshes during extreme weather was recently conducted by the University of Cambridge. This study efficiently demonstrated that these marshes are an effective way of managing and reducing the destruction caused by severe storm wave action. The study showed that a mere 40 meters of salt marsh reduced storm surge wave height by nearly 20%. Shoreline erosion was also minimal after such surges as the root structures held the soil steadfast, even under conditions where the above soil parts of the plants were decimated.

As a Sandy survivor both myself and my family have been financially, personally, and otherwise affected by coastal flooding. Due to the storm surges several members of my family had their homes destroyed or deemed inhabitable. My uncle and his family were only legally allowed to return to their home this January and my in-laws are getting the final permits this month, nearly five years after the storm. From my experiences, my education, and the research I have conducted I truly believe that barriers created using natural defenses will be the best and most sustainable form of protection for the City of Norfolk.

Arlene Fields Warren, Virginia Department of Health, 804-864-7781

The Office of Drinking Water has no comments at this time of Scoping on this project.

Patricia VonOhlen, 9801 River Road, Newport News, Virginia, wvonohlen@gmail.com

I am glad to see/read that the Army Corp is working on strategies to address sea level rise and tidal flooding in Norfolk. Although I live in Newport News, I believe that standards and recommendations put in place for Norfolk will set a precedence that other Hampton Roads cities will follow. My comment is that I'd like to see ACOE place a high priority on green infrastructure and NOT on a hardened shoreline approach. Living shorelines and protection and expansion of wetland type areas will bring the best results over time. Shoreline vegetation (native plants) is a highly effective strategy.

Thank you for your work on this important issue and thank you for considering my comments.

Vanessa Whitehurst, 1328 Bolton Street, Norfolk, Virginia, vwhite@nps.k12.va.us

My name is Vanessa Whitehurst, I reside at 1328 Bolton St Norfolk, VA. When it rain continually for several hours the corner of Bolton and Golf Street floods terribly, we could use row boats to get in and out of the neighbor.

Cheryl Copper, 611 Massachusetts Avenue, Norfolk

Colonial Place-Riverview President Tobie Serafim sent your email and a deadline of June 30 to get you resident's input on flooding here. Here are a few thoughts:

1. We've lost two cars to non-hurricane flooding on Norfolk Streets (the first was at Washington Park near Colonial—Cogan's Pizza area Ghent and the other was in Colonial Place on Michigan Ave)
2. With even gentle rains it floods on
 - a. Many parts of Mayflower (both ends—near Colley and at Colonial and around New Jersey or New York)
 - b. Delaware at Lafayette Towers
 - c. Delaware at Lewellyn
 - d. Storm drains backing up has brought water up to the mid-600 block of Massachusetts Avenue
 - e. Intersections even at our higher roads as we exit the neighborhood (Colonial, Lewellyn) in Park Place
 - f. Underpasses

3. Historically, many of our waterways were deep enough for tall sailing ships (Lafayette River for one), but development has sent more than a century of sediment into the river and its tributaries. It's true that dredging is expensive and disturbs the benthic community established in mud, but it would give our waterways (I think) more volume to hold storm water.

4. Barring that, I wish we had a large scale capacity to pump, collect and store rainwater for later community use to help prevent that runoff from adding to flooding. A large water tank. Water trucks. We have three rain barrels, but they can fill up in minutes. Even if every home had several rain barrels, it wouldn't be enough to offset the flooding we see.

5. Our Unitarian Church at the Hague cancelled Sunday services three times due to flooding at our front door. Our weekly bulletin posts tides so we know where to park. A gate is being discussed there, and I don't know how that's engineered, but it can't come soon enough. It's one of the reasons we must move to another location—in Va. Beach. Dredging there might mitigate some flooding.

Thanks for your help on this important topic.

Doug Beckmann, 722 Lesner Avenue, 202, Norfolk, 714-4482

The scope of the flood risk management study should consider ongoing work and mandates to improve the Chesapeake Bay ecosystem that will occur simultaneously with the efforts to reduce flood risk. Although independent from a regulatory standpoint, the efforts to reduce future flood risk and the efforts and mandates to restore the Chesapeake Bay ecosystem offer many opportunities to complement one another and to provide synergistic effects. For example, living shorelines and oyster reefs provide marine habitat, improve water quality and at the same time mitigate storm effects and erosion. Conversely, some of the more traditional "hard engineering" solutions to mitigate the effects of coastal storms, such as sea walls, have a harmful effect on marine ecosystems.

The scope of the flood risk management study should identify and maximize efforts that achieve the dual and complementary goals of reducing flood risk and improving the Chesapeake Bay ecosystem; and conversely, the study should identify ways to minimize flood mitigation measures that are harmful to the Chesapeake Bay ecosystem.

Maggie Moore, magatola@earthlink.net

I understand that these are only scoping comments, but I am concerned that because this is a feasibility study and Federal EIS, specific city implementation measures will not be a part of any alternatives.

Actual zoning ordinances, tax incentives, or project funding could make a difference in the nuisance flooding that occurs in many neighborhoods. The haphazard concrete work that has been performed by the city to date near streams and at culverts is causing more rapid flooding during storm events.

In addition, there are concerns that any recommendations/alternatives will not be implemented across all city departments. All alternatives in the scoping information not only affect public works and right-of-way but also a wide variety of other departments. The zoning variance committee alone has incredible power in adding more impermeable surfaces throughout the city and approving development where other departments (planning, parks and recreation) may not have recommended it. These day-to-day operations within the city are truly indirect and cumulative effects and should be treated as such. Other departments, such as GIS, may already have key information for the study and need to be involved from this point forward.

Michael Tylor, 3808 Jefferson Boulevard, Virginia Beach

In your upcoming study referenced on the subject line above, please take into account the Chesapeake Bay Blueprint and the goal we all share of improving the Chesapeake Bay ecosystem.

As I am sure you know, flood mitigation can be achieved using methods that are complementary to water quality, as opposed to other methods that are harmful. I won't delineate here as I am sure you are familiar with the various methods, but please understand that many of us are very concerned with the health of our Bay and its tributaries. We understand that flood mitigation is important, but so is the financial, recreational and overall quality of life aspects of the Bay. These are important to us all in Hampton Roads.

Please emphasize the flood mitigation methods that are Bay friendly in your report. Common sense says that we can prevent flooding best by working with Mother Nature, as opposed to against her. Thank you for your work on behalf of the Bay, and for your time and consideration.

**Winston Bibee, 2114 Maple Street, Virginia Beach, Virginia 23451, 334-1091,
Winston.bibee@gmail.com**

I first wanted to thank you and the USACE for your hard work and leadership on the Norfolk Flood Risk Management Study in particular, and the North Atlantic Coast Comprehensive Study overall. Through such efforts we can make better informed and more successful decisions on how to handle flooding and sea level rise in the region and the country.

As the study is conducted and methods for flood mitigation are determined, I would ask that considerable effort be placed on solutions that not only mitigate flooding but also benefit water quality in the region. Many of the more common hardened shoreline solutions used in the area such as revetments, bulkheads, and rip rap may actually have a negative impact on water quality and the environment. In addition these options are not sustainable in the long term and provide no resilience in the face of sea level rise. Alternative "green" solutions such as constructed wetlands, living shorelines, and oyster breakwaters provide similar services as the hardened shorelines mentioned above and they provide the added benefits of improving water quality and providing habitat. These green alternatives are also more sustainable and resilient, as they will

migrate upland as sea levels continue to rise. Other ecologically beneficial solutions such as rain gardens, bio swales, and infiltration trenches should also be considered where appropriate. These green solutions are often equally or more effective than less environmental options and can be implemented at a fraction of the cost.

Although I understand all options will be considered in this study, I would suggest that when a determination is being made of which solution to use the more environmental solutions would be given more weight and preference over those that do not provide the added benefit of substantial ecosystem services. In this way we can focus on solutions that will mitigate flooding and sea level rise in a long term sustainable manner while improving water quality, as opposed to short term solutions that will decrease water quality.

Thank you again for your work. I look forward to the results of the study.

Denise Mosca, 6977 Ark Road, Gloucester, Virginia, 804-693-9097

Thank you for the opportunity to submit comments. I would encourage the Corps, in conjunction with the City of Norfolk, to consider the Norfolk area ecosystem as a whole in the flood risk management study, to see where living shorelines and green infrastructure can be used to buffer the shoreline and create habitat. Hardening of the Norfolk shoreline with traditional gray infrastructure, like seawalls, bulkheads or rip rap, as well as the use of impervious surfaces in the city, contributes to the sea level rise that this study is trying to address. These natural solutions can be used to ameliorate the function of existing city structures, replace infrastructure as it needs replacement and engineer forward thinking options for flood minimization benefits for the years to come.

In addition to all the ecological benefits to coastal green infrastructure options, they may be constructed for a fraction of the cost of traditional methods. Please give every consideration to their use wherever possible in this flood risk management study.

Lela Smith, Norfolk

Hello my name is Lela Smith I am contacting you because it has come to my attention that a flood risk management study will be conducted in the City of Norfolk. As a resident of Norfolk and a marine biologist and oceanographer I am hoping some ecologically friendly methods will be evaluated and implemented. There are a few available options that will not only reduce flooding susceptibility, but also be self-sustainable, and economically viable. Several cities impacted by Superstorm Sandy, including New York City and Point Pleasant Beach, where I grew up, are implementing ecological methods to reduce flood risk. These methods include replenishing, restoring, and establishing salt marshes and oyster reefs. I am hoping Norfolk will follow in the foot-steps of these other great cities in adopting these water and storm management options, which would not only mitigate the flood risk but would also help to clean the waters surrounding Norfolk and add to the health of the bay system.

There are several reasons to consider utilizing oyster reefs in place of sea walls. Seawalls are expensive, solid, non-adaptable structures. Due to their inability to adapt to environmental changes they are subject to being undermined over time by both passive and active erosion. The implementation of these walls would not only be costly, but would also result in immediate changes in the currents, a reduction of the aesthetical value of the land, the gradual erosion and loss of public land, and a lessening of biodiversity of the ecosystem. On the other hand, as a living structure, oyster reefs are able to adapt to the new conditions which the ocean and bay system will often present, making it a more sustainable option. These living infrastructures also filter water (approximately 50 gallons per oyster per day) as well as help to hold sediment in place, while reducing wave energy that reaches the shoreline. The result of which is an overall lessening of erosion of the shore line. Oyster beds have been proven to be highly effective at reducing wave action that reaches the shore. After Sandy, which cost New York City over 40 billion dollars, a study was conducted to see how much of the wave action of storms hitting the city would be reduced if the historical oyster beds were still in place. The results of this study was that as much as 200% reduction would occur if the beds were still there.

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As a Sandy survivor both myself and my family have been financially, personally, and otherwise affected by coastal flooding. Due to the storm surges several members of my family had their homes destroyed or deemed inhabitable. My uncle and his family were only legally allowed to return to their home this January and my in-laws are getting the final permits this month, nearly five years after the storm. From my experiences, my education, and the research I have conducted I truly believe that barriers created using natural defenses will be the best and most sustainable form of protection for the City of Norfolk.

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Attached Letter Comments



Mr. David Schulte
 Department of the Army
 U.S. Army Corps of Engineers
 Norfolk District, Fort Norfolk
 803 Front Street
 Norfolk, VA 23510

Subject: National Environmental Policy Act Scoping Comments - The City of Norfolk Flood Risk Management Study

Dear Mr. Schulte:

On behalf of Elizabeth River Project (ERP), I submit the following comments regarding the U.S. Army Corps of Engineers (USACE) National Environmental Policy Act (NEPA) scoping for the City of Norfolk Flood Risk Management Study. We appreciate the opportunity to submit these comments.

As you know Norfolk has experienced a total of 14 inches of relative sea level rise since 1930. Half of this sea level rise has been attributed to land subsidence and the remainder to rising waters. Future sea level rise will be at this rate, if not greater, and Virginia Institute of Marine Science has developed a range of estimates from three to seven feet of sea level rise by 2100. The range of sea level rise from these scenarios will significantly impact the City of Norfolk and its infrastructure unless we are proactive in addressing the issue. We commend the City of Norfolk and the Corps of Engineers for being proactive in developing a City-wide flood risk management plan.

The approach which the City of Norfolk and the Corps of Engineers take moving forward will be precedent setting not only for the region, but also for the nation, since all eyes are on Norfolk and Hampton Roads on how we will address rising seas. The two main options for addressing sea level rise include taking a nature based approach using "natural infrastructure" which would include building tidal wetlands, oyster reefs, sand dunes, and native vegetated berms. Alternatively, the "grey infrastructure" approach would include sea walls, rip rap revetments, dikes, tide gates, and other hardened shoreline designs.

Pursuant to the requirements of section 102(2)(C) of the National Environmental Policy Act (NEPA) of 1969, and its amendments, the Army Corps of Engineers will develop a feasibility study with an integrated Environmental Impact Statement (EIS) to evaluate environmental impacts from reasonable project alternatives and to determine the potential for significant impacts related to reduce future flood risk in ways that support the long-term resilience and sustainability of the coastal ecosystem.

ERP believes that the feasibility study, where possible, should favor natural infrastructure for the following reasons:

475 Water Street, Suite C103A, Portsmouth, Virginia 23704 (757)399-7487 www.elizabethriver.org

- 1) Natural infrastructure can be self-maintaining and has the potential for self-repair after storms. As living systems, tidal wetlands and oyster reefs have the potential to recover quickly after a storm without significant human intervention. Compared to sea walls, bulkheads, and levees which have shown to need human intervention for maintaining and repairing after floods. ERP has built significant numbers of wetlands and oyster reefs throughout the Elizabeth River which have had no significant storm damage. One of our largest projects at Money Point included restoration of a three acre oyster reef and a seven acre wetland restoration. This project has witnessed major nor'easters and hurricanes since 2009, and no repair has been needed. This project has also significantly reduced flooding to the upland industry, Kinder Morgan/Elizabeth River Terminals.
- 2) Natural infrastructure will also grow and has the potential to keep pace with sea level rise. Rodriguez et al. 2014, found that intertidal oyster reefs should be able to keep up with future accelerated rate of sea level rise through vertical growth of the reef. While existing low marsh areas may not be able to survive at their current elevation in 30 years, these systems do have the ability to migrate upland with sea level rise. However grey infrastructure like sea wall and tide gates do not adapt to sea level rise and are fixed at a specific elevation without significant human intervention and engineering.
- 3) Natural systems can also provide significant protection to wave action. For example reefs reduce wave energy by 97% and the crest of reefs can reduce wave height as much as 84% (Ferrario et al. 2014). Möller et al. 2014, found that up to 60% of wave reduction can be attributed to vegetation and that marsh substrate will remain stable and resistant to surface erosion under all conditions, even once waves had broken the stems of marsh plants.
- 4) Natural infrastructure can also be more esthetically pleasing for a community while also providing habitat for a greater diversity of wildlife. While not everyone might agree, a community of sea walls and bulkheads are less esthetically pleasing than a community of salt marsh and oyster reefs. It has been shown that bulkhead and sea walls overall have lower species diversity compared to natural shorelines (Seitz, R.D et al. 2006).

ERP does understand that a natural infrastructure approach may not be able to be used in all situations; however, hybrid approaches can be considered when natural systems will not work. These hybrid approaches use living breakwaters, which combine oyster reefs/blocks with traditional breakwaters, and in some cases, wetland. For a review and example of cities where hybrid approaches haven seen successfully used please see (Sutton-Grier et al. 2015. Env Science and Policy).

New York City will be using this approach with a new project called “Rebuild By Design the Big U Project” which will provide climate adaptation and recreational opportunities. The project will integrate hard and soft infrastructure with recreational

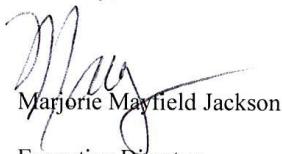
benefits. It will provide integrated flood protection into the community while also improving water access through the use of wetlands, berms, and flood walls or barriers.

In addition the City of Seattle just installed one of the nation's first living sea wall which provides habitat for fin fish and invertebrates while also providing visitors with a better appreciation of Elliott Bay (see link for more information: <http://www.seattletimes.com/seattle-news/environment/seattles-new-seawall-also-a-highway-for-fish/>).

ERP also understands that flooding due to sea level rise will impact areas of the city not directly adjacent to a water body. This can occur when water flows back through stormwater pipes causing flooding inland. All of the cities in Hampton Roads, including Norfolk, are currently working to meet a federally mandated Total Maximum Daily Load requirement to reduce nitrogen, phosphorus, and sediments to the Chesapeake Bay. To meet this requirement, significant water quality improvements will be installed throughout the city and we believe there are significant opportunities to combine flood protection with stormwater improvements. We would recommend that the Corps of Engineers develop a close working relationship with the City of Norfolk's Stormwater Division to understand what projects are anticipate in the next 10 years, and how they can be improved to reduce flooding. In addition, we believe that two groups together could also identify new projects which would have multiple benefits of reducing flooding while also reducing pollution to our rivers.

By evaluating, focusing on natural infrastructure and hybrid approaches in the development of the feasibility and EIS documents, the Corps of Engineers and Norfolk will be setting a precedent for the region for addressing flooding and creating habitat while improving water quality. ERP and the community have been striving for 22 years to bring back this urban river and we have made significant strides. We hope that this plan will have to accelerate habitat restoration while also improving water quality. We thank you for allowing us the opportunity to provide guidance to the development of the feasibly study and hope you will allow Joe Rieger (jrieger@elizabehriver.org) to participate on your Advisory Committee for this study. If you have any questions regarding our comments, please feel free to contact me at 757-399-7487 or at mmayfield@elizabehriver.org.

Sincerely,



Marjorie Mayfield Jackson
Executive Director

Attached On-Line Responses

John Prince in Ward 1 June 28, 2016, 8:43 PM

Where and how does it flood?

It floods because of storms and any system associated with northeast fetch winds. There is no other reason it floods. And it is NOT flooding on sunny calm days as NOAA has stated which is not helpful to understanding this issue. It floods in the lower areas because of Norfolk's old areas with antiquated drainage systems and an increase in pavement and un-creative grading unmitigated by pervious ground, plainly put. And the city still allows pavement, at increasing levels, without mitigating for it with pervious space. These are the basic reasons it floods. Call me if you need more.

What should we do to mitigate flooding?

You can call me any day, and any time, but creating more space for rain water to travel through is the key, and planting large native tree species (NOT more Asian small and diminutive species that do nothing to mitigate).

Also, Not requiring businesses and homes to have an equal amount of impervious parking - Norfolk cannot absorb any more of these requirements. And, repairing and replacing outdated drainage plumbing –anyone can see this is not keeping up with getting rid of water.

What shouldn't we do to mitigate flooding?

Planting small, diminutive Asian trees in mass to satisfy some code for small size. (We need large native trees which draw up water copiously. Charleston SC does this and they have a worse flooding problem than us, and they do not allow Asian species. :)) Add fancier pavement with the idea that this helps funnel water out of harm's way- it does not. Before the city implements its Resiliency budget, ensure that the HALF (\$60 million) earmarked for "consulting, legal and design" fees does NOT happen, and that a far smaller percentage for legal consult design is allowed. (The notion that HALF of the Resiliency grant Norfolk has been awarded - \$60 million- is slated for these non-on-the-ground services (design, legal, consult) illustrates the great "follow-the money" game that is so prevalent in environmental repair -with much of the money not getting to the real projects necessary - and rightfully and rapidly fueling American's distrust with the issue. As such, Norfolk should not be emulating in architecture and new construction heavy, brick Colonial styles more apparent in central Virginia, but should be seeking unique "coastal" identifier architecture that is lighter and more flexible in many ways. Currently, too many new structures are required (nicely) built with old central Virginia colonial architecture, but this architecture is not coastal and not what we need to be building. We need a more unique coastal identifiable architecture.

What opportunities does the city have because of water?

Livability, mild climate, tourism, to show off its natural resources and beauty, and reclaim the sort of natural beauty that Charleston SC has, unabashedly, and in full native and natural force. (Norfolk is still in the closet with understanding and marketing its Coastal Southern flora and climate as Charleston does). This would create a natural world that is beautiful and understanding

of its place in history like that of Bermuda and Charleston. This is where we need to look. We are not and should not emulate a northern industrial economy. Flooding in Norfolk We want to hear your thoughts on flooding in Norfolk.

Rick Jones in Ward 2 June 23, 2016, 3:08 PM

Where and how does it flood?

I live in The Hague. It floods all around parts of the inner perimeter of the waterway. The three most noticeable parts are (1) by the Chrysler Museum (to include the adjacent street intersections), (2) Mowbray Arch between Mill Street and Colonial Avenue, and (3) Mowbray Arch near the corner of Fairfax. I'm not sure what you mean by "how does it flood?" It rises over the walls of the Hague and floods the streets and the little park between the water and the street. In some places it has destroyed the trees and ground vegetation. It often renders the streets unusable to foot traffic, and sometime even to vehicular traffic.

What should we do to mitigate flooding?

I can only speak to The Hague, but I would put some sort of lock or gate under the Brambleton Avenue bridge. In keeping with the concepts related to Dutch Dialogs, use the top of that lock to also be a foot bridge so that people can walk without having to go up on Brambleton Avenue. Perhaps put a pumping station in the Unitarian Church that has been ruined by the flooding at the corner of Yarmouth and Grace. I realize there is a run off problem due to the two creeks that were originally there and that have been covered up. I have no suggestions for that. Regardless, follow the Dutch Dialog precepts and come up with a solution that can solve more than one problem at the same time.

What shouldn't we do to mitigate flooding?

Do not be short-sighted. This is going to be a century-long issue (if not more), and a very, very long-term approach needs to be considered.

What opportunities does the city have because of water?

Hard to say. More water sports, like kayaking, perhaps? Very high water could let deeper draft vessels in if timed properly.

Name not shown in Ward 2 June 22, 2016, 5:44 PM

Where and how does it flood?

The 400 block of W Princess Anne Rd. Street flooding especially where Debree and Princess Anne meet.

What should we do to mitigate flooding?

In some neighborhoods with street flooding small things will help - like rain gardens and retaining ponds. Tidal flooding requires larger scale projects.

What shouldn't we do to mitigate flooding?

The city can focus on large scale projects, but also encourage and assist residents to do things at home and in neighborhoods that will slow down rain runoff.

What opportunities does the city have because of water?

Recreational and cultural. Be a leader in sea-level rise education and research.

Christian Strange in Ward 5 June 18, 2016, 12:30 PM

Where and how does it flood?

Flooding typically occurs near downtown and Ghent/Colonial Place during high tides or big rain storms. There are other random spots where flooding happens a lot like on East Little Creek Road between Military Highway and Shore Drive, near Ocean View, and sometimes in neighborhoods either with poor drainage or with no sewer grates, just ditches.

What should we do to mitigate flooding?

Raise roadway elevation in flood prone areas, raise seawalls (Hague), reduce building and housing in flood areas, even pay for and demolish existing buildings and help people relocate from very flood prone zones making those areas wetlands again. Increase signage on flood prone roads. Be transparent and vocal about reducing the impact of flooding that can't be mitigated so citizens are aware of when and where flooding happens.

What shouldn't we do to mitigate flooding?

Nothing. Allow continued development in the most flood prone zones.

What opportunities does the city have because of water?

Norfolk has a great opportunity to improve recreational offerings related to the water, wetlands, and how we can live with and interact with flooding. Every school aged child in Norfolk should have multiple opportunities to learn about our waterways and how water is a key component of the City. We can also use area near water that don't flood as places to build up (i.e., multi-level towers) versus building out into the wetlands. This will increase the taxable density, improve revenues, and provide funds to deal with flooding.

Name not shown outside Norfolk June 17, 2016, 9:57 AM

Where and how does it flood?

Corner of Stockton Rd and Biltmore Rd.. storm drains not draining properly

What should we do to mitigate flooding?

The city prepares for snow & ice by pre-salting the road, do the same with the drains...clean them out in advance of a major storm

What shouldn't we do to mitigate flooding?

Put it off

What opportunities does the city have because of water?

None.. it will save wear & tear on the neighborhood yards, as the vehicle traffic does ride up on the sidewalks to avoid the flooding,

Connie Davis in Ward 2 June 16, 2016, 11:07 PM

Where and how does it flood?

Llewellyn at the split with Granby; in underpasses; almost any low spot; on the [unfortunately] buried old creeks; the Hague; you name it, it floods

What should we do to mitigate flooding?

Is there some way to collect the water and pump it into cisterns for future use such as lawn watering in droughts; washing streets, bldgs. I'm not suggesting de-salinizing it for drinking water. Build sea walls? Cease allowing building in current, and more importantly, future flood zones? Any way to collect it, purify it sufficiently (get out the salt if sea water OR only collect rain water) and somehow pump it underground to reach the aquifer(s) - would or would not doing so mitigate the ground subsidence and have a positive effect?

What shouldn't we do to mitigate flooding?

I'm sure there are some bad ideas - can't think of any just now. Maybe not build the Tide extension at ground level - elevate it at the 2075 expected sea level? Or maybe by then we'll use another transportation type - say, drones?

What opportunities does the city have because of water?

There are obvious advantages - living on water; port facilities all of which are also "challenges". I would not, in advertising NFK as a wonderful place to live (as it is) as a waterside city.

Wendi White in Ward 2 June 16, 2016, 9:33 AM

Where and how does it flood?

On the corner of Bolling and Carillo. At the intersection of 49th and Bluestone.

What should we do to mitigate flooding?

It will have to be a combination of strategies contingent on the funding available: flood gates for the most critical infrastructure, marsh grass and shoreline restoration, retreat from the most vulnerable areas that are built on fill, new zoning rules to prevent new construction or reconstruction in high risk areas.

What shouldn't we do to mitigate flooding?

Allow the greatest burdens of relocation and displacement to fall on lower-income residents.

What opportunities does the city have because of water?

Recreation, shipping, military bases.

Kim Cabotaje in Ward 2 June 15, 2016, 10:37 PM

Where and how does it flood?

My street floods in a heavy downpour--Elmore Place, Lafayette Shores 2. We do our best not to even park in the street and have to be vigilant when there is rain if we're in the street. Several of my neighbors have inherited their homes from parents or grandparents. They report that the flooding began when the brick wall was erected to separate Lafayette Shores 2 from LS 1. Folks have gone to city council over the years and have been told that it is caused by the storm drains clogging up. I have a neighbor who routinely rakes and cleans the street before stormy weather, and still it floods.

What should we do to mitigate flooding?

Installation of living roofs would help to absorb rain water and prevent runoff and flooding.

What shouldn't we do to mitigate flooding?

Not sure.

What opportunities does the city have because of water?

I'm not sure what this question is asking. Opportunities as a result of being surrounded by rivers and the bay? We could certainly be leaders in protecting the natural waterways and the essential life they contain.

Name not shown in Ward 5 June 15, 2016, 11:06 AM

Where and how does it flood?

Ocean View Avenue near the bay streets flood regularly. The right hand lane is usually unusable.

What should we do to mitigate flooding?

Better drainage on OV Ave.

What shouldn't we do to mitigate flooding?

Allow future development in areas that are SUPER prone to flooding.

What opportunities does the city have because of water?

Boating, Wildlife refuges, a unique city that offers more than other inland cities. People in general LOVE to live by the water.

Name not shown in Ward 3 June 15, 2016, 10:36 AM

Where and how does it flood?

At the intersection of Illinois Avenue and Lafayette Blvd., every time it rains.

What should we do to mitigate flooding?

The storm drain system needs major repair/renovation. Offer rain barrels to residents. Step up anti-littering efforts; one of the major problems in my neighborhood is that the drainage ditches are blocked with garbage from haphazard littering. Norfolk is a filthy city and needs a major anti-littering campaign.

What shouldn't we do to mitigate flooding?

No Response

What opportunities does the city have because of water?

No Response

Name not shown in Ward 5 June 15, 2016, 9:23 AM

Where and how does it flood?

Throughout the City - Larchmont, Downtown (especially sections of Olney, Brambleton, Princess Anne roads), Huette Drive (near Botanical Garden), Pretty Lake in East Ocean View and West OV to Willoughby. Sometimes it is rainfall with nowhere to go, but often it's rising waters - rivers, "lakes", Bay.

What should we do to mitigate flooding?

Allow for flood zones ... I've seen this done in Florida. Neighborhoods that are prone to flooding would be the natural location for these flood plains. Yes, it may be a difficult political road and this is where we need fearless leadership. It could be a hard pill for some people to face relocation, but it makes the most sense and some of us are tired of spending tax dollars to save those homes and roads (especially in Larchmont).

What shouldn't we do to mitigate flooding?

We shouldn't ignore it. We shouldn't keep doing the same thing that doesn't work and expect different results (e.g., Larchmont)

What opportunities does the city have because of water?

Norfolk is a water mecca. Having lived in drought areas, it's a blessing. We can celebrate our rich water resource. We can embrace it and live with it. We can build a canal with kayaking. Reno NV has done this – or check out Richmond. It could be situated near ODU - which would also put it close to the base. We need to clean our waterways - I rarely sail in the Elizabeth River because it is so yukky. Improving the waterways, attracting boaters, kayakers, fisher people, etc. could truly be a boon to our economy.

Name not shown in Ward 4 June 15, 2016, 9:17 AM

Where and how does it flood?

At the entrance to Elizabeth Park neighborhood, occasionally water "pools" across a "dip" in a stretch of Curlew Ave between the Light Rail line and the timber line collection pond next to the sound wall. Specifically, about 20 yards West of the intersection of Curlew Ave. and Corporate Blvd., and the entrance to the Park & Ride lot opposite the crossing gates. This normally happens

after either a prolonged period of rain or an intense single rain event. Eventually, the water recedes, but it does happen from time to time.

What should we do to mitigate flooding?

Raise that section of Curlew Ave. with fill and pavement to make the road all on one level.

What shouldn't we do to mitigate flooding?

No Response

What opportunities does the city have because of water?

Save it for a drought.

Name not shown in Ward 2 June 15, 2016, 8:23 AM

Where and how does it flood?

Colonial Place...specifically Mayflower Road

What should we do to mitigate flooding?

Good question. If money is not an issue, flood gates across the Bay Bridge Tunnel w/ locks in ship channels would protect the entire Chesapeake Bay. Building flood walls in area where flooding happens, though unsightly and view blocking would be a cost effective measure. Though internal low areas of Colonial Place specifically flood due to rising water backing up through the storm drains and a flood wall will not fix.

What shouldn't we do to mitigate flooding?

Everything should be on the table. Then use a risk mitigation to cost benefit analysis to narrow options...easier said than done.

What opportunities does the city have because of water?

Water front views abound as well as ready access to water for recreational activities.

jimdreano@netzero.net ginger in Ward 5 June 10, 2016, 8:05 PM

Where and how does it flood?

In my location, it may be best to ask what was done. My house on the Corner of Devon and Earl Sts. Flooded unbearably, whenever we got a couple consecutive days of steady rain.in fact, the only thing that kept my house from flooding, was that my lot was built-up, before construction,

and elevated. A little more difficult at mowing, but well worth it. Anyway, I have not experienced street flooding in a while, and the waters seem to drain properly.

What should we do to mitigate flooding?

I have witnessed only two resolutions, and short of being a Topographical Engineer, am not sure exactly where, how, and if they are practical in all locations. As I stated earlier, at the risk of sounding obvious, elevating property, and routing, volume, and maintenance of storm sewer lines, appear to be the only functional, long-term resolutions. What may seem overkill at the time, may well be property and even life-saving advantages in the future. Addressing isolated problem areas, seems to be a band aid solution. A wholesale assessment of Norfolk, with its respect to the surrounding Tidewater areas, with an approach toward, large scale, long term resolution of storm water evacuation, is needed, to avoid solving a single problem that might migrate to another area. The "Big Picture", must be the constant goal, while routing pipes, drains, sewers, etc. to deflect consistent deluging of Norfolk. Subsequently, a schedule of maintenance, supported by periodic monitoring and testing of these systems, to expose weak spots. Sounds simple, but like most oversight projects, it's also about money. If not well managed financially, the best plans, will remain as inked paper, collecting dust. I believe, having been a Norfolk Resident in many locations, for almost half a century, that, a well thought out, logical, and fiscally responsible concept, can be developed, that will actually save millions in property damage, and achieve Resident Safety goals far into the future !

What shouldn't we do to mitigate flooding?

What we shouldn't do, is, allow this issue to degrade into a clash of egos, a political football, or a power debacle (sound dramatic ? just look at that empty rail, Norfolk residents will pay for, forever !), the goal is serious, and the solutions must be comprehensive. Most important, is a pathological assessment, of what we have that currently meets, or needs the least in changes, rendering the lowest cost, shortest time, effort, which may also yield, insight, both in the assessment, and the (re) construction phases. Then the feedback, positive results, and review, of what was done, what provided the best results, etc. we can eliminate our losses (if any), and duplicate our successes. I understand this sounds a bit vague, and general, but until the initial analysis, is conducted, that's all you can logically have. It would be interesting, to do an overlay, of a topographical (elevation) map, on top of a recent map, of our current sewer, drain, stormwater system routing. Again, it may sound simplistic, but it would be foolish, to not employ the two greatest natural, and cost free elements, Geography, and Gravity, to our advantage.

What opportunities does the city have because of water?

What? I hope somebody actually reads this. Seriously? Is someone looking for a pat on the back, for Norfolk's natural Harbor? Seaport? Recreational access? Wrong direction. Stop looking here. Let the PR Department handle advertising and travel brochures.

Mary Prier in Ward 1 June 9, 2016, 4:36 PM

Where and how does it flood?

It floods the intersection / entrance to the Willoughby Neighborhood during heavy rains. It is dangerous and damaging to drive through it. Vehicles (trucks mostly) that speed down the street push waves into our garage -- we had to replace the garage door because of this.

What should we do to mitigate flooding?

Storm water management for heavy rainfall. Can there be an engineering fix -- open gates to pipe the water into the Bay when it gets heavy? The police did a good job trying to close off traffic, but I don't like to see them have to do that kind of duty.

What shouldn't we do to mitigate flooding?

Use funds to address the drainage not to pay people to raise their homes.

What opportunities does the city have because of water?

I'm not sure what this question means in the context of a flooding survey. Is this when you define a problem as an opportunity? We have an opportunity to address the problems in the realm of the sustainability project to mitigate the effects of sea level rise. We have an opportunity to develop Ocean View and Willoughby into valuable neighborhoods on the shores of the scenic Chesapeake Bay, but the plans and vision for the area seem to have been misplaced somewhere during the Great Recession.

Name not shown in Ward 2 May 25, 2016, 7:02 PM

Where and how does it flood?

Hampton Boulevard, the Hague, some streets in Larchmont

What should we do to mitigate flooding?

Rain barrels, restore wetlands, do not permit rebuilding in flood areas (with help for relocation), restore low lying areas as wetlands, build overpasses on critical roads (such as Hampton Boulevard), relocate critical power stations. Start now.

What shouldn't we do to mitigate flooding?

Subsidize raising of houses in areas prone to flooding.

What opportunities does the city have because of water?

Ports, navel shipyards, military, cruise lines, recreation.

Brett Jenkins in Ward 3 May 25, 2016, 7:21 AM

Where and how does it flood?

Coleman Place Palmyra Street 2400 block is the main street that floods along with at least three others behind it, but that one is the worst. Anytime it rains we must move our cars.

What should we do to mitigate flooding?

Clean drains more frequent. In other areas of the city I think we should put up some type of water tank or tower with the ability to pump and store water to be time released.

What shouldn't we do to mitigate flooding?

No Response

What opportunities does the city have because of water?

No Response

Name not shown in Ward 2 May 24, 2016, 2:45 PM

Where and how does it flood?

1. Intersection of 4th View and West Ocean View right in front of Thirsty Camel
2. West Ocean View and 12 view st. by 711

What should we do to mitigate flooding?

Spend money and re-work willoughby spit storm drain system. its antiquated and not effective during moderate or greater storms.

What shouldn't we do to mitigate flooding?

Nothing

What opportunities does the city have because of water?

We have the opportunity to spend infrastructure money and create jobs by upgrading an old antiquated framework of storm drains and sewers that hasn't been updated for almost a century in some places....and definitely as recent as the 1950's and 1960's in most places.

Jonathan Ross in Ward 4 May 24, 2016, 2:30 PM

Where and how does it flood?

During storms and above normal high tides, Townsend Road between Jasmine and Fontaine (in the curve) floods all the time. When it does we can't get in and out of the neighborhood. That is the only way in and out since they closed off the section of Fontaine.

What should we do to mitigate flooding?

Either reopen Fontaine or raise the road and provide better drainage

What shouldn't we do to mitigate flooding?

No Response

What opportunities does the city have because of water?

No Response

Andrew Bean in Ward 2 May 24, 2016, 1:34 PM

Where and how does it flood?

Intersection of Argall Ave and Cedar Ln.

What should we do to mitigate flooding?

Would it help to increase the size of storm drain inflows? The storm drain on the northeast corner of the intersection looks like it has mildly collapsed downward, decreasing the size of the entrance.

What shouldn't we do to mitigate flooding?

No Response

What opportunities does the city have because of water?

No Response

Stephanie Stewart in Ward 2 May 24, 2016, 12:55 PM

Where and how does it flood?

It floods everywhere! :) Really though, I work near the corner of Olney/Boush/VB Blvd. and have to be very creative how I get to work some days! Llewellyn and Monticello are also an issue, even during "regular" rain. I've seen Wards Corner flood, but not as often and is typically only when there's a major storm. The combination of rain and tidal flooding is the worst.

What should we do to mitigate flooding?

All options should be explored. Would love to see creative options on how we can live with the water.

What shouldn't we do to mitigate flooding?

Don't know enough about this area to say.

What opportunities does the city have because of water?

Wonderful entertainment: beaches, canoeing, kayaking, boating, fishing. Cruise port, military..... It's also gorgeous!

Name not shown in Ward 5 May 24, 2016, 12:48 PM

Where and how does it flood?

19th Bay and Pleasant Ave becomes very flooded and many vehicles cannot pass through. It also floods badly past Pleasant Ave on 18th Bay.

What should we do to mitigate flooding?

I'm unsure. There is a lot of construction going on in the area, which may also contribute to this. Maybe it would help to have some sort of marker/cone to indicate to drivers how deep the standing water is. Possibly outline a detour for residents unfamiliar with flooded areas and safer routes.

What shouldn't we do to mitigate flooding?

Pump water to different area, as this just seems to increase flooding area.

What opportunities does the city have because of water?

I don't understand this question.

Leann White in Ward 2 May 24, 2016, 12:43 PM

Where and how does it flood?

Downtown, Ghent, any low areas or streets by waterways.

What should we do to mitigate flooding?

Supplement funding to inject water back into the aquifer to stop or slow Norfolk from sinking. Local industry continues to pull water out and it's impossible to replenish at that rate without technology and human intervention. Focusing on Tidal flooding helps only a small part of the problem. Let's set up a system to continuously replenish what we take out by treating water and returning it to the aquifer.

What shouldn't we do to mitigate flooding?

Build more flood walls instead of preventing the problem.

What opportunities does the city have because of water?

No Response

Name not shown in Ward 4 May 23, 2016, 7:10 PM

Where and how does it flood?

Downtown Ghent is where I see a lot though it can be seen in more areas along Princess Anne Ave and Virginia Beach Blvd making my commute interesting when it rains a lot.

What should we do to mitigate flooding?

Improve sewers and add pumps

What shouldn't we do to mitigate flooding?

No Response

What opportunities does the city have because of water?

Shipping, recreational and the military activities depend on the water

Louise Owens in Ward 5 May 23, 2016, 7:37 AM

Where and how does it flood?

Pretty much all of east ocean view, especially 19th Bay and pleasant Ave even when there is no storm

What should we do to mitigate flooding?

With road work on pleasant avenue add curbs and keep storm drains clean

What shouldn't we do to mitigate flooding?

Really don't know what can be done, being the low lying areas perhaps build up the banks of pretty lake

What opportunities does the city have because of water?

I really have no answer

Audrey Lindsey in Ward 4 May 22, 2016, 11:31 AM

Where and how does it flood?

I live near Norfolk State area and there are several areas that needs improvements, such as: Park Avenue/Virginia Beach Blvd, Princess Anne Road/Ballentine Blvd, and the on and off ramps on Campostella Rd near the interstate.

What should we do to mitigate flooding?

Install a better drainage system that regulates the flooding. Add a jersey wall where the flooding occurs, so that the Elizabeth River water will not pour in and flood the streets. Most of the flooding in this area mostly comes from high tide.

What shouldn't we do to mitigate flooding?

Research techniques that the city has already researched on because it's not working.

What opportunities does the city have because of water?

Use the water to their advantage, there have been ways to use water as a energy source. I think it will be a good economic source to use water to save energy and I think it will be very effective and it will be a smart way to save money in the long run. If the city is more eco-friendly using products and materials to help with this overflow of water, Virginia would be known as the most Eco-friendly State ever.

Benjamin Camras in Ward 2 May 19, 2016, 12:40 PM

Where and how does it flood?

Flooding from rainfall and tidal flooding are the most common types of nuisance flooding in the city. It leads to so many impassable roads it can be hard to get home, if not impossible. Some of the biggest trouble spots from rainfall/inundation flooding: Princess Anne & Monticello, Princess Anne & Debree, Llewellyn between Princess Anne and Shirley, Colley & Princess Anne, long stretches of Princess Anne between Military and Ballentine, Boush & Grace - it's really all over the place. And the flooding happens so quickly. I cannot get into or leave my neighborhood during these events.

What should we do to mitigate flooding?

Decrease the amount of impervious surfaces in the city. Restore waterways that have been filled in for development. Promote the use of rain barrels and other techniques to capture stormwater runoff in developed areas. Replace asphalt/concrete with pervious versions. Adapt existing green spaces to better collect stormwater. Create living recreation areas along the waterfront that are designed to flood.

What shouldn't we do to mitigate flooding?

I think all options should be explored. I would like to see more efforts concentrated on adapting our city to absorb and distribute water in more creative ways than underground pipes. It will be important to implement strategies that help us deal with flooding and inundation in the city, in addition to installing mechanisms that keep water out. But keeping water out (tide gates, flood walls) is not the singular answer.

What opportunities does the city have because of water?

Tons! Our waterfront areas are part of what makes this city so special. Why not embrace the challenges water creates and have our city be a 21st century example of how to live with water? We could be a national (and global) example of how to passively and actively plan for and react to all types of flooding. Though dealing with unwanted water presents a lot of challenges, it presents so many opportunities to exhibit novel approaches in urban design, environmental

planning, community health, recreation, transportation, civic engagement, and economic development, all of which can work cohesively to address our water related problems.

Name not shown in Ward 5 May 15, 2016, 11:11 AM

Where and how does it flood?

All of East Ocean View, from 1st Bay-21st Bay. At the ends of the Bay Streets and along Pleasant Avenue and Pretty Lake Avenue. Every time it rains and every time the tide is over 3.5 feet.

What should we do to mitigate flooding?

Build a flood gate at Pretty Lake for major storms. Improve infrastructure in neighborhoods so that water goes down storm drains when it rains instead of coming back up through them like a fountain.

What shouldn't we do to mitigate flooding?

Spend money on repeats of studies that have already been performed.

What opportunities does the city have because of water?

The city has great recreational and educational opportunities because of the rivers, lakes and Chesapeake Bay. We also have the opportunity to set an example for other cities on how to improve infrastructure, building codes and emergency response to deal with sea level rise.

Cameron Waite in Ward 1 May 13, 2016, 9:15 AM

Where and how does it flood?

Llewellyn Avenue between Connecticut Ave and Delaware Ave; Sections of Mayflower Ave. This happens at every high tide and during every rain.

What should we do to mitigate flooding?

There is a 2 acre parcel for sale along Llewellyn Avenue between Riverview and Colonial Place. The City should investigate various ways for purchasing the property i.e. federal or state funding to transform the land into a wetlands buffer. Removing 2 acres of land in favor of new wetlands would benefit all neighborhoods bordering the Lafayette River as an additional storm buffer.

What shouldn't we do to mitigate flooding?

No Response

What opportunities does the city have because of water?

The boat ramp and the existing walkway could both be expanded to increase quality of living for Norfolk residents.

Clara Heyder in Ward 2 May 11, 2016, 7:44 PM

Where and how does it flood?

Washington Park streets during heavy rains. Flows from Blair Middle school to Colonial Ave.

What should we do to mitigate flooding?

Better drainage and more drains

What shouldn't we do to mitigate flooding?

Should try everything

What opportunities does the city have because of water?

Recreation and business

Name not shown in Ward 2 May 11, 2016, 5:35 PM

Where and how does it flood?

Streets and intersections, largely due to tidal levels. I am most familiar with those near Mowbray Arch; VB Blvd/Olney.

What should we do to mitigate flooding?

Is it possible to install regulators on street drains to prevent tidal flooding through them? This seems to be the most common issue I see. I understand some (expensive) plans have been considered regarding flood gates for the Hague/Smith's Creek, which seems necessary.

What shouldn't we do to mitigate flooding?

No Response

What opportunities does the city have because of water?

It drives our economy and our entertainment. The city should take better advantage of entertainment on the waterfront. Town Point Park is a wonderful asset used only during a few months a year. I hope Waterside will work - this time - but it's a shame to have been closed so long. And it's a shame the renovation doesn't include bathrooms accessible for Town Point Park. I do think the city should have left the waterfront more accessible and used more broadly (rather than being so heavily city-owned development - or lack thereof) such as was done in Annapolis.

June 2017 Project Evaluation Public Meeting Comments

Tom McNeilan, 757-761-0616, tom@mcneilan.com

1. Why is the scope of “projects” in the 3x3x3 apparently limited (with perhaps a few limitations) to the projects as defined by the 2010 “(illegible) study” for Norfolk Public Works? Cannot the USACE define and evaluate other projects and approaches?
2. Is there really any possibility that the 3x3x3 study can lead to something other than an approved project that sits on the shelf awaiting post-disaster funding?
3. How will the USACE define projects so that 30 years from now – after the disaster- the project definition provides the most possible flexibility so that the new thoughts & opportunities can be included – ex. not like Ocean View sand nourishment project definition did not allow optimization (that isn’t part of the authorized projects we can’t do that & resulted in very unfavorable bid prices.
4. How tremendously disappointing to see the USACE’s recent council presentation & see the city spending \$1.5M to repeat the \$200k (illegible) study. And yes, I realize it is “part of the federal process.”
5. Why does the USACE study consider synergistic opportunities?
6. Why doesn’t the USACE study consider larger –more holistic- concepts for Little Creek and Eastern Branch? – and yes I know that wasn’t part of the study – (illegible) to the broken USACE process

Name Not Provided

What steps are being taken to limit sea level rise? It seems like measures only propose to reduce damage.

Is this a regional issue with Ohio Creek and the study Norfolk is being looked? What about Hampton and Newport News? Norfolk is not alone with these issues.

Cindy Sink, cindysink42@gmail.com

I’m so glad proposals and mandate are ongoing. And while a surge barrier and floodwall could certainly help, I appreciate even more the creation of absorption areas with ponds and grasses. Personally, in the corner of my yard that floods from slough overflow, the creation of a denser garden with plants to absorb the water has been effective. The creation of natural ponds would be great in neighborhoods.

Mark Ferley, 757-617-9683

With regard to floodwalls and gates, please ensure adaptability planning so the wall can be added onto after the original is constructed.

Larry Atkinson, ODU, 757-683-4926, latkinso@odu.edu

Changes in tidal flow – any structures will reduce the flow in the Lafayette. This will reduce flushing of the river. Additionally the structures cause de-stratification. Note: I did a study for Suerdrup Eng on the effect of the CBBT expansion. So, please do studies of the changing oceanographic characteristics of the river as structures are added.

Will Redfern, Algonquin Park LL, willredfern@hotmail.com

Best thing for Lafayette River Area is to put surge barriers from terminals to new railyard/coal piers. This preserves all the real estate along the river, which is some of the expensive in the city. Thank you!

Karen Speights, Chesterfield Heights, 757-672-6355, tru2_1self@yahoo.com

It is difficult to understand from this format how these findings pertain to my neighborhood. I would preferred a more structured meeting followed by separate stations. I was not able to learn much from this presentation. It was also unclear who were the experts in what field.

Joe Cox, 495-1553, eastbeachjoe@gmail.com

Why would the City of Norfolk and Corps of Engineers permit a developer to build two five-story buildings in a flood area Pretty Lake Drive that already floods with each heavy rain? Traffic congestion will magnify during flooding or in the event of mandatory evacuation from approaching hurricane.

Syble Stone Cox, 757-287-5147, sstone1180@aol.com

Presently we have a developer who is planning to build two five story apartments between Little Bay and Pretty Lake Drive. This area already floods and the people living in the condos at the end of Pretty Lake cannot get out of their neighborhood. Bay Point cannot get out of their street. The same developer wants two build two more apartments has already built a (illegible) story apartment complex that floods with a heavy rain! Now we are adding two more buildings – PLEASE CONSIDER THE SAFETY OF THE RESIDENTS WHO LIVE IN BAY POINT. Should we have a level 5 hurricane – THEY WILL NOT BE ABLE TO SURVIVE!

Lynn Roth Taylor, 757-276-3880, lynnrrohtaylor@gmail.com

1. Put major land work on maps
2. Name the major streets
3. Have meetings in bigger rooms with proper air flow
4. Small groups are great but need more space between groups and sound management
5. Thank you for your work and we look forward to future meetings. It's a serious problem.
6. Include individual civic leagues on group email list.

Charles Cook, 625-1734, ccook35@cox.net

One suggestion for major flood prone areas is to follow the New Orleans example in which one house has a roof that can be used as a helicopter pad for rescue purposes. Brad Pitt helped to build such a house in Ward 9. Residents know to go to that house in case of emergency. Ward 9 floods more than any area of the city, so residents feel a sense a comfort knowing that an opportunity for rescue exists. Although not something the Corps of Engineers would implement, it is something the city or state should consider.

Jean Jordan, 757-423-4019, jeanhjordan@cox.net

Thank you for having this open house.

1. It is difficult to get much information from individual people standing next to boards. I would suggest in the future to have a public meeting divided by section of the city, possibly in separate

rooms and give a presentation on each section of the city allowing questions at the end. It is such a large proposal and I understand it is difficult to address everyone's concerns.

2. Also, it would be helpful to have a map of proposal online that can be zoomed in/out. The map in current PowerPoint slides on Next Door Network does not zoom with detail. Thank you!

James Weckerly, 757-440-5276, jamesweckerly@gmail.com

I believe the surge barrier wall from NIT to Lamberts Point is the best choice of options presented for my Larchmont neighborhood. As long as there are oyster beds and grass marshland included on both sides of the structure for aesthetics. Recommend inclusion of trees into the project as well. One group that is impacted, but not available for comment are the ODU students with dormitories in the flood/storm surge zones. I believe they would "vote" for the NIT to Lamberts Point project as well. Keeping Hampton Blvd open and the naval base accessible should be a priority. Where "raising" structures is the best option, could cisterns to catch rainwater be incorporated into the design? Using "rain water" as flushing water for toilets and yard sprinkler systems would be a green benefit. My second choice is the combination barrier/seawall from NIT to Larchmont and sea wall to Lamberts Point. Thank you for the meeting.

Georg Dahl, 757-343-5271, georg.dahl@cox.net

The structure across the Lafayette (NIT to NS Coal) needs to be designed so flow in the river is high enough so the river flushes to minimize the pollution buildup.

Karen Lindquist, Green Stream Technologies, 757-339-1855, Karen.lindquist@greenstream.com

As a resident of Norfolk, and as a member of the Chesapeake Bay Foundation and board member of the local chapter of the Sierra Club, I am strongly in favor of natural mitigation solution ex) living shorelines and restored wetlands, to the extent that these are possible.

As an employee of Green Stream Technologies, I'd like to have a conversation with you about low-cost water level sensors that continuously monitor tides and can provide more data points for analysis of storm events than current extrapolation methods.

Maggie Moore, 440-4148, magatola@earthlink.net

Please work with the city on detailed alternatives such as: modified city zoning for frequently inundated properties (not residential, instead open space). Tax penalties for impermeable surfaces in all permits.

Please consider environmental justice in this study. The potential for a disproportionate and adverse impact on a low-income community is high in this area.

Please choose natural and nature based features in all alternatives considered.

Please do not consider structural measures. They have failed time and time again throughout the history of the area and USACE. Mother Nature will return the shoreline to its previous state.

Karen Crawford, 757-810-2254, karcrawecu@gmail.com

We live on Mowbray Arch on The Hague and experience major issues with tidal flooding and storm surge. There are historic homes, Chrysler Museum, and Christ/St. Luke's Church that are at risk in this area. We would recommend a flood gate/wall to be put in place in order to save the historic treasures in Norfolk. Also, improved storm drains should help in the short term.

Lori and David Baccanari, 757-537-4990, baccanari5@gmail.com

We are definitely interested in a long term solution for storm surges – including a flood wall at Hampton Blvd Bridge. But our immediate concern is the frequent flooding of our street on high tides which prevents us from driving to and from our house. The bulkhead is in dire need of repair and water even flows backwards in storm water drains flooding street before water even rises over bulkhead. The city came out and agreed to install a one-way valve but have heard nothing since January/February 2017

Robbyn Gayer, 757-406-6487, robynsmobile@gmail.com

Concerning the proposed flood wall/tide gate near The Hague. It is important to preserve properties and water quality of The Hague if possible. This area is a gem in the city and should be preserved well.

Stringfield, VDOT, 757-925-3669

Will the display information be on a website for future use? City of Norfolk or Corps of Engineers Site.

Betty Baucom, Norfolk Public Schools, 620-5995, bettybaucom@cox.net

It seems like flooding needs to be a new weather category for Norfolk officials to consider as it impacts students and teachers ability to get to school. In low-lying areas of our city students who are walkers in community schools are stranded by water in yards and sidewalks that they have to cross are sitting in class with wet shoes all day. Really, it's a price of growing up in our city, but it is a more frequent concern when there are downpours and flooding that happens at 8:00 and 3:00 in the afternoons. Notice how often that happens. Increasingly flooding impacts the operations of schools.

William R Jennings, Stop the Flooding Now, stopthefloodingnow@outlook.com

1. Please consider as a priority hurricane storm surge mitigation for all of Hampton Roads.

Shawn Ware-Avant, 757-839-1120, swareavant@cox.net

I am grateful the city is taking a proactive approach to flooding. It is a historic problem for our city and both a health and safety risk. I am concerned, however, that a fiscal evaluation that produces a cost/benefit analysis around the coastal risk of our city might lean more heavily toward acquisition and relocation. I have heard discussions of offering land trusts to residents but not as much about how the city might instead offer funds and/or incentives to encourage and assist residents in elevating their homes and installing both flood damage reduction and sustainable/environmental (illegible) solutions on their properties. If the city is focused on building sustainable communities, why not assist residents in joining together to maintain them? We've endured the flooding for decades.

Jeanne Walters, 757-489-8896, jeanne0325@yahoo.com

Thank you for your display and information 6/8/2017. As a long term Larchmont resident (I grew up here from early elementary school) I've seen the impact and increase of flooding issues. In fact, after having water again in my duct work for Hurricane Isabel (water ready to come over the top to my hardwood floors) I felt I had to mitigate. And so, after Thanksgiving in 2003 they started to raise my home 5 feet. This was done without help from FEMA since the city said it could be years before FEMA help might occur. Had I not done so, I would have had water in my home at least twice. I see substantial increases in "nuisance" flooding and it is worsening. Your potential plan to put in floodgates between NIT and Lamberts Point makes the most sense. Though it will be more expensive, in the long run a better use of money. Otherwise many more homes will require raising (or razing) or will continue to flood. Running flood gates down Hampton Blvd does not seem best logically, not to mention it is the same area as a potential route for the Tide extension to the base. NIT/Lamberts Point floodgates will have a positive reduction for the most number of residents in this area being considered.

Terry Legg, WRA, 757-869-9113, Tlegg@wrallp.com

Great job on the story boards! Great format for this type of discussion with both city of Norfolk and USACE reps available to answer questions. Thanks for putting all this effort in the meeting and the study. I hope congress provides the funding to move some of these concepts into the next phase of development. Thanks for your service to our community!

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AGREEMENT
BETWEEN
THE DEPARTMENT OF THE ARMY
AND
CITY OF NORFOLK, VIRGINIA
FOR THE
CITY OF NORFOLK FLOOD RISK MANAGEMENT STUDY

THIS AGREEMENT is entered into this 3rd day of FEBRUARY, 2016, by and between the Department of the Army (hereinafter the "Government"), represented by the U.S. Army Engineer, Norfolk District (hereinafter the "District Engineer") and the City of Norfolk (hereinafter the "Non-Federal Sponsor"), represented by the City of Norfolk, City Manager.

WITNESSETH, THAT:

WHEREAS, US Senate Committee on Environment and Public Works Resolution authorizes that the Secretary of the Army review the report of the Chief of Engineers on beach erosion and hurricane protection for Norfolk, VA, dated April 17, 1984, and other pertinent reports, to include existing flood risk management studies and engineering reports to determine whether any modifications of the recommendations contained therein are advisable in the interest of flood damage reduction in the vicinity of Norfolk, Virginia; and

WHEREAS, Section 105(a) of the Water Resources Development Act of 1986, Public Law 99-662, as amended (33 U.S.C. 2215(a)), specifies the cost-sharing requirements; and

WHEREAS, the Government and the Non-Federal Sponsor have the full authority and capability to perform in accordance with the terms of this Agreement.

NOW, THEREFORE, the parties agree as follows:

ARTICLE I - DEFINITIONS

A. The term "Study" means the activities and tasks required to identify and evaluate alternatives and the preparation of a decision document that, as appropriate, recommends a coordinated and implementable solution for flood risk management at the City of Norfolk, Virginia.

B. The term "shared study costs" means all costs incurred by the Government and Non-Federal Sponsor after the effective date of this Agreement that are directly related to performance of the Study and cost shared in accordance with the terms of this Agreement. The term includes, but is not necessarily limited to, the Government's costs for preparing

the PMP; for plan formulation and evaluation, including costs for economic, engineering, real estate, and environmental analyses; for preparation of a floodplain management plan if undertaken as part of the Study; for preparing and processing the decision document; for supervision and administration; for Agency Technical Review and other review processes required by the Government; and for response to any required Independent External Peer Review; and the Non-Federal Sponsor's creditable costs for in-kind contributions. The term does not include any costs for dispute resolution; for participation in the Study Coordination Team; for audits; for an Independent External Peer Review panel, if required; or for negotiating this Agreement.

C. The term "PMP" means the project management plan, and any modifications thereto, developed in consultation with the Non-Federal Sponsor, that specifies the scope, cost, and schedule for Study activities and tasks, including the Non-Federal Sponsor's in-kind contributions, and that guides the performance of the Study.

D. The term "in-kind contributions" means those planning activities (including data collection and other services) that are integral to the Study and would otherwise have been undertaken by the Government for the Study and that are identified in the PMP and performed or provided by the Non-Federal Sponsor after the effective date of this Agreement and in accordance with the PMP.

E. The term "maximum Federal study cost" means the \$1,500,000 Federal cost limit for the Study, unless the Government has approved a higher amount.

F. The term "fiscal year" means one year beginning on October 1st and ending on September 30th of the following year.

ARTICLE II - OBLIGATIONS OF THE PARTIES

A. In accordance with Federal laws, regulations, and policies, the Government shall conduct the Study using funds appropriated by the Congress and funds provided by the Non-Federal Sponsor. The Non-Federal Sponsor shall perform or provide any in-kind contributions in accordance with applicable Federal laws, regulations, and policies.

B. The Non-Federal Sponsor shall contribute 50 percent of the shared study costs in accordance with the provisions of this paragraph and provide required funds in accordance with Article III.

1. No later than 15 calendar days after the effective date of this Agreement, the Non-Federal Sponsor shall provide funds in the amount of \$25,000, for the Government to initiate the Study, including preparation of the PMP. In the event more funds are needed to develop the PMP, the Government shall provide the Non-Federal Sponsor with a written estimate of the amount of funds required from the Non-Federal Sponsor, and no later than 15 calendar days after such notification, the Non-Federal Sponsor shall provide the full amount of such funds to the Government.

2. As soon as practicable after completion of the PMP, and after considering the estimated amount of credit for in-kind contributions that will be afforded in accordance with paragraph C. of this Article, the Government shall provide the Non-Federal Sponsor with a written estimate of the amount of funds required from the Non-Federal Sponsor to meet its share of the shared study costs for the remainder of the initial fiscal year of the Study. No later than 15 calendar days after such notification, the Non-Federal Sponsor shall provide the full amount of such funds to the Government.

3. No later than August 1st prior to each subsequent fiscal year of the Study, the Government shall provide the Non-Federal Sponsor with a written estimate of the amount of funds required from the Non-Federal Sponsor during that fiscal year. No later than September 1st prior to that fiscal year, the Non-Federal Sponsor shall provide the full amount of such required funds to the Government.

C. The Government shall include in the shared study costs and credit towards the Non-Federal Sponsor's share of such costs, the costs, documented to the satisfaction of the Government, that the Non-Federal Sponsor incurs in providing or performing in-kind contributions, including associated supervision and administration. Such costs shall be subject to audit in accordance with Article VI to determine reasonableness, allocability, and allowability, and crediting shall be in accordance with the following procedures, requirements, and limitations:

1. As in-kind contributions are completed and no later than 60 calendar day after such completion, the Non-Federal Sponsor shall provide the Government appropriate documentation, including invoices and certification of specific payments to contractors, suppliers, and the Non-Federal Sponsor's employees. Failure to provide such documentation in a timely manner may result in denial of credit. The amount of credit afforded for in-kind contributions shall not exceed the Non-Federal Sponsor's share of the shared study costs less the amount of funds provided pursuant to paragraph B.1. of this Article.

2. No credit shall be afforded for interest charges, or any adjustment to reflect changes in price levels between the time the in-kind contributions are completed and credit is afforded; for the value of in-kind contributions obtained at no cost to the Non-Federal Sponsor; for any items provided or performed prior to completion of the PMP; or for costs that exceed the Government's estimate of the cost for such item if it had been performed by the Government.

D. To the extent practicable and in accordance with Federal laws, regulations, and policies, the Government shall afford the Non-Federal Sponsor the opportunity to review and comment on solicitations for contracts prior to the Government's issuance of such solicitations; proposed contract modifications, including change orders; and contract claims prior to resolution thereof. Ultimately, the contents of solicitations, award of contracts, execution of contract modifications, and resolution of contract claims shall be exclusively within the control of the Government.

E. The Non-Federal Sponsor shall not use Federal Program funds to meet any of its obligations under this Agreement unless the Federal agency providing the funds verifies in writing that the funds are authorized to be used for the Study. Federal program funds are those funds provided by a Federal agency, plus any non-Federal contribution required as a matching share therefor.

F. Except as provided in paragraph C. of this Article, the Non-Federal Sponsor shall not be entitled to any credit or reimbursement for costs it incurs in performing its responsibilities under this Agreement.

G. In carrying out its obligations under this Agreement, the Non-Federal Sponsor shall comply with all the requirements of applicable Federal laws and implementing regulations, including, but not limited to: Title VI of the Civil Rights Act of 1964 (P.L. 88-352), as amended (42 U.S.C. 2000d), and Department of Defense Directive 5500.11 issued pursuant thereto; the Age Discrimination Act of 1975 (42 U.S.C. 6102); and the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), and Army Regulation 600-7 issued pursuant thereto.

H. If Independent External Peer Review (IEPR) is required for the Study, the Government shall conduct such review in accordance with Federal laws, regulations, and policies. The Government's costs for an IEPR panel shall not be included in the shared study costs or the maximum Federal study cost.

I. In addition to the ongoing, regular discussions of the parties in the delivery of the Study, the Government and the Non-Federal Sponsor may establish a Study Coordination Team to discuss significant issues or actions. The Government's costs for participation on the Study Coordination Team shall not be included in the shared study costs, but shall be included in calculating the maximum Federal study cost. The Non-Federal Sponsor's costs for participation on the Study Coordination Team shall not be included in the shared study costs and shall be paid solely by the Non-Federal Sponsor without reimbursement or credit by the Government.

ARTICLE III - PAYMENT OF FUNDS

A. As of the effective date of this Agreement, the shared study costs are projected to be \$3,000,000, with the Government's share of such costs projected to be \$1,500,000 and the Non-Federal Sponsor's share of such costs projected to be \$1,500,000. These amounts are estimates only that are subject to adjustment by the Government and are not to be construed as the total financial responsibilities of the Government and the Non-Federal Sponsor.

B. The Government shall provide the Non-Federal Sponsor with quarterly reports setting forth the estimated shared study costs and the Government's and Non-Federal Sponsor's estimated shares of such costs; costs incurred by the Government, using both Federal and Non-Federal Sponsor funds, to date; the amount of funds provided by the

Non-Federal Sponsor to date; the estimated amount of any creditable in-kind contributions; and the estimated remaining cost of the Study.

C. The Non-Federal Sponsor shall provide to the Government required funds by delivering a check payable to "FAO, USAED, Norfolk (E4)" to the District Engineer, or verifying to the satisfaction of the Government that the Non-Federal Sponsor has deposited such required funds in an escrow or other account acceptable to the Government, with interest accruing to the Non-Federal Sponsor, or by providing an Electronic Funds Transfer of such required funds in accordance with procedures established by the Government.

D. The Government shall draw from the funds provided by the Non-Federal Sponsor to cover the non-Federal share of the shared study costs as those costs are incurred. If the Government determines at any time that additional funds are needed from the Non-Federal Sponsor to cover the Non-Federal Sponsor's required share of the shared study costs, the Government shall provide the Non-Federal Sponsor with written notice of the amount of additional funds required. Within 60 calendar days of such notice, the Non-Federal Sponsor shall provide the Government with the full amount of such additional funds.

E. Upon conclusion of the Study and resolution of all relevant claims and appeals, the Government shall conduct a final accounting and furnish the Non-Federal Sponsor with the written results of such final accounting. Should the final accounting determine that additional funds are required from the Non-Federal Sponsor, the Non-Federal Sponsor, within 60 calendar days of written notice from the Government, shall provide the Government with the full amount of such additional funds. Should the final accounting determine that the Non-Federal Sponsor has provided funds in excess of its required amount, the Government shall refund the excess amount, subject to the availability of funds. Such final accounting does not limit the Non-Federal Sponsor's responsibility to pay its share of shared study costs, including contract claims or any other liability that may become known after the final accounting.

ARTICLE IV - TERMINATION OR SUSPENSION

A. Upon 30 calendar days written notice to the other party, either party may elect at any time, without penalty, to suspend or terminate future performance of the Study. Furthermore, unless an extension is approved by the Assistant Secretary of the Army (Civil Works), the Study will be terminated if a Report of the Chief of Engineers, or, if applicable, a Report of the Director of Civil Works, is not signed for the Study within 3 years after the effective date of this Agreement.

B. In the event of termination, the parties shall conclude their activities relating to the Study. To provide for this eventuality, the Government may reserve a percentage of available funds as a contingency to pay the costs of termination, including any costs of resolution of contract claims, and resolution of contract modifications.

C. Any suspension or termination shall not relieve the parties of liability for any obligation previously incurred. Any delinquent payment owed by the Non-Federal Sponsor pursuant to this Agreement shall be charged interest at a rate, to be determined by the Secretary of the Treasury, equal to 150 per centum of the average bond equivalent rate of the 13 week Treasury bills auctioned immediately prior to the date on which such payment became delinquent, or auctioned immediately prior to the beginning of each additional 3 month period if the period of delinquency exceeds 3 months.

ARTICLE V - DISPUTE RESOLUTION

As a condition precedent to a party bringing any suit for breach of this Agreement, that party must first notify the other party in writing of the nature of the purported breach and seek in good faith to resolve the dispute through negotiation. If the parties cannot resolve the dispute through negotiation, they may agree to a mutually acceptable method of non-binding alternative dispute resolution with a qualified third party acceptable to the parties. Each party shall pay an equal share of any costs for the services provided by such a third party as such costs are incurred. The existence of a dispute shall not excuse the parties from performance pursuant to this Agreement.

ARTICLE VI - MAINTENANCE OF RECORDS AND AUDIT

A. The parties shall develop procedures for the maintenance by the Non-Federal Sponsor of books, records, documents, or other evidence pertaining to costs and expenses for a minimum of three years after the final accounting. The Non-Federal Sponsor shall assure that such materials are reasonably available for examination, audit, or reproduction by the Government.

B. The Government may conduct, or arrange for the conduct of, audits of the Study. Government audits shall be conducted in accordance with applicable Government cost principles and regulations. The Government's costs of audits for the Study shall not be included in shared study costs, but shall be included in calculating the maximum Federal study cost.

C. To the extent permitted under applicable Federal laws and regulations, the Government shall allow the Non-Federal Sponsor to inspect books, records, documents, or other evidence pertaining to costs and expenses maintained by the Government, or at the request of the Non-Federal Sponsor, provide to the Non-Federal Sponsor or independent auditors any such information necessary to enable an audit of the Non-Federal Sponsor's activities under this Agreement. The costs of non-Federal audits shall be paid solely by the Non-Federal Sponsor without reimbursement or credit by the Government.

ARTICLE VII - RELATIONSHIP OF PARTIES

In the exercise of their respective rights and obligations under this Agreement, the Government and the Non-Federal Sponsor each act in an independent capacity, and neither is to be considered the officer, agent, or employee of the other. Neither party shall provide, without the consent of the other party, any contractor with a release that waives or purports to waive any rights a party may have to seek relief or redress against that contractor.

ARTICLE VIII - NOTICES

A. Any notice, request, demand, or other communication required or permitted to be given under this Agreement shall be deemed to have been duly given if in writing and delivered personally or mailed by certified mail, with return receipt, as follows:

If to the Non-Federal Sponsor:

Marcus D. Jones
City Manager
1101 City Hall Building
810 Union Street
Norfolk, Virginia 23510

If to the Government:

Jason E. Kelly, PMP
Colonel, U.S. Army
US Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510-1011

B. A party may change the recipient or address for such communications by giving written notice to the other party in the manner provided in this Article.

ARTICLE IX - CONFIDENTIALITY

To the extent permitted by the laws governing each party, the parties agree to maintain the confidentiality of exchanged information when requested to do so by the providing party.

ARTICLE X - THIRD PARTY RIGHTS, BENEFITS, OR LIABILITIES

Nothing in this Agreement is intended, nor may be construed, to create any rights, confer any benefits, or relieve any liability, of any kind whatsoever in any third person not a party to this Agreement.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement, which shall become effective upon the date it is signed by the District Engineer.

DEPARTMENT OF THE ARMY

BY:

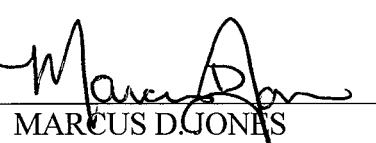


JASON E. KELLY, PMP
Colonel, U.S. Army
District Engineer

DATE: 03 Feb 2016

CITY OF NORFOLK, VIRGINIA

BY:



MARCUS D. JONES
City Manager

DATE: 2/3/16



August 2, 2017

Col. Jason E. Kelly
 District Commander
 US Army Corps of Engineers, Norfolk District
 803 Front Street
 Norfolk, VA 23510

Re: City of Norfolk Coastal Storm Risk Management Study

Thank you for your recent presentation to our Technical Policies Committee. We applaud the Norfolk District and the City of Norfolk for forward-thinking efforts to prepare for rising seas. Part of making Norfolk resilient will involve safeguarding the environmental quality of our waters, which make up so much of the city's identity, marketability and quality of life. As you finalize design alternatives, our comments are in this regard.

- 1) **Environmental impacts, Lafayette River and Broad Creek, due to changes in hydrodynamics and loss of high quality habitat with wall structures** - We are concerned that the proposed structures could significantly reduce flushing and result in more residence time for sediments and nutrients, potentially setting back recent concerted efforts of dozens of local, regional and federal partners that so far have resulted in historic progress with restoring the Lafayette River sub-watershed of the Elizabeth River. Recently the Lafayette was removed from the state's list of impaired waters for bacteria and the Lafayette is on track to become the first Virginia river to meet bay goals for restoration of native oyster populations. Similar concerns apply to Broad Creek, the new top focus area for many of the same partners, including City of Norfolk, working together with federal, regional and local funds to improve failing water quality there.
 - a. Lafayette River: If a surge barrier cannot be avoided, locating such a barrier along the Hampton Boulevard bridge may have less impact to the Lafayette River than the other two surge barrier alternatives located nearer the mouth of the Lafayette. The other two have a larger footprint and sequester waters in the healthiest stretch of the Lafayette where the highest quality river bottom habitat exists, with coarse grain sand that harbors high benthos or bottom dwelling life such as hard clams and attracts a high diversity of fin fish. This area of the Lafayette consistently shows the highest diversity of species in the Lafayette on annual fish surveys by Elizabeth River Project and Chesapeake Bay Foundation. In addition, the barriers at the mouth of the Lafayette appear to impact restored oyster reefs and one of them appears to impact an oyster leasing ground.

- 2) **Environmental impacts, the Hague** – The Hague should not be written off as a lost cause. Among your alternatives, we are especially concerned regarding the alternative of a

Page 2

permanent wall that would block off The Hague from the river system, posing the potential for total loss of this part of the Elizabeth River. There appear to be a number of viable alternatives recently proposed for flood control and water quality improvement in the Hague that should be seriously considered. Recent otter sightings over the last two years in the Hague, typically seen feeding on fish and shellfish, are an indicator of viable marine life that should be enhanced and not abandoned.

- a. Creative design concepts proposed for flood control along the Hague by the Coastal Community Design Collaborative (presented by Dr. Mason Andrews and her architecture students at Hampton University to the City of Norfolk Executive Flood Committee, Fall 2015) should be explored regarding potentially more appropriate and more effective alternatives for reducing flooding along The Hague while contributing to ecosystem health in this section of the Elizabeth River (see attached excerpts, Power Point). In particular, the Hampton University team suggests a combination of barriers (to keep flood water out) and sponges (to hold water). While these ideas are conceptual, they appear to hold significant merit for further exploration, especially since we understand that the Ghent neighborhood was supportive during extensive community involvement activities, with some neighbors even offering to help pay for implementation:
 - i. Raise the existing armored shoreline along Mowbray Arch with a higher bulkhead enclosing a vegetated walking trail. The team preliminarily estimated this at \$25 M, which they understood to be perhaps half the cost of barrier walls being considered.
 - ii. Add check valves to existing stormwater outfalls to prevent backflow from the river.
 - iii. Consider a water activated buoyant flood wall, which rises with the tide, such as marketed by Aggeres Flood Solutions and used in Belgium and Scotland. We understand that the neighborhood was favorable to this concept, as the viewshed generally would not change except in flood conditions.
 - iv. To hold water (sponge effect), the collaboration suggested Stockley Gardens (former creek bed) be considered for conversion into large dry swales that still could offer recreation opportunities (grassy areas still could host the Stockley Gardens Art Show, etc). As former creek bed, the soil is expected to hold water for quite some time.
 - v. The old Leigh Memorial hospital, now deteriorating, could be torn down, part of the site redeveloped and the income used to fund a walled rain garden that we understand is of interest to the Chrysler.
 - vi. Consider an underground water retention basin beneath Botetourt Gardens.
 - vii. Consider an underground retention basin beneath the Chrysler (bladder in the basement).
 - viii. The Hague Stormwater Evaluation and Improvement Concept, a 2014 study for the City of Norfolk by Moffatt & Nichol, presented what appear to be a

series of relatively cost-effective concepts that would improve water quality and sediment quality while assisting with improved control of wet weather flooding. Among these, removal of sediment accumulations (cost estimates, \$600,000 to \$1.6 M), would increase the volume capacity of the Hague while potentially improving water quality. Oyster restoration, a living shoreline and a living cap are all promising alternatives as well.

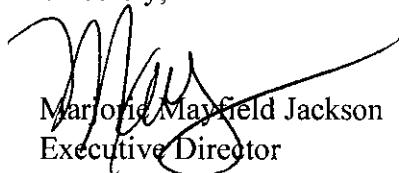
- b. The City of Norfolk is currently designing a stormwater wetland and a living shoreline (30%) along the southwest shore of the Hague, projects which also should help with natural flood control. Some funding has been identified.

- 3) **Over-reliance on walls versus vegetated berms with wetlands and warm season grasses throughout the draft study approach** – Natural alternatives should be considered to allow for greater habitat benefits including the opportunity for wetland retreat during sea level rise. These approaches can be highly successful with absorbing flooding as demonstrated at our Money Point restoration site, where a new berm and wetland protected an industry very successfully during the highest recorded tide at Elizabeth River Terminals during a northeaster storm in November 2009. The terminal reported less flooding than in past storms, even though the NOAA tide station showed the highest recorded tide level in the Chesapeake Bay.

- 4) **Mitigation of impacts** – Offsetting the impacts of structures added will be critical to continuing the recovery of the Elizabeth River. Wetlands, open water and benthic habitat will be significantly impacted. As discussed earlier, the barrier structures anticipated in the Lafayette would impact the healthiest area of the Lafayette, the branch of the Elizabeth currently leading in river recovery.

Thanks again for your efforts to keep us abreast of the planning underway. Please include Elizabeth River Project when holding planning activities that include technical representation from the larger community.

Sincerely,



Marjorie Mayfield Jackson
Executive Director

Cc: Norfolk City Council
Doug Smith, Norfolk City Manager
Christine Morris, Norfolk Resilience Officer
Susan Conner, Norfolk District Corps of Engineers