Attachment A
Scope of Services

Phase 1.0 – Preparation

Task 1.1: Project Kickoff

VII.B.7., Page 8 The AECOM team will work closely with the Policy Committee and Technical Committee throughout the JLUS process. We will begin the project with a kick-off session with both committees to refine the study objectives and desired outcomes for each of the tasks. This will ensure that the consultant team is approaching each task appropriately, to deliver the required work products and that the goals of each committee member are aligned to facilitate decision-making. The following items will be addressed at the kick-off meeting:

- Project work plan including schedule and format and timing of deliverables for each task
- Timing of Policy and Technical Committee meetings and likely topics for the meetings
- Communication channels between the consultant team and the Policy and Technical Committees. This is particularly important given there are essentially seven entities involved: HRPDC, City of Norfolk, City of Virginia Beach, and four Navy installations.
- Establishment of a team SharePoint site (or similar data sharing platform)
- Identification of and communication protocols with stakeholder organizations or individuals that are not part of the committees

Task 1.2Public Engagement Strategy

VII.B.7., Page 8 AECOM places extraordinary emphasis on the engagement components of the JLUS and our experience has shown that people access and provide information in various ways. We believe that the value of the study is as much about the people of the communities and an inclusive process as it is the technical product. Because the Hampton Roads region is one of the most studied and discussed areas in our nation when it comes to the physical, social, and economic effects of coastal storms, tidal and precipitation flooding, historical and future SLR, this study poses a unique challenge in differentiating how the JLUS incorporates and builds upon other studies that address resiliency issues. A carefully planned and thoughtful process that looks for opportunities to tie into other concurrent resiliency efforts in the region will enrich the outcome of the JLUS and result in more informed and implementable strategies.

VII.B.7., Page 8 Our community engagement specialists will work closely with the Committees to develop an Engagement Strategy that identifies public meeting objectives; a proposed schedule; general meeting content, venues and format; alternate outreach platforms; key stakeholders to engage; website content; social media and other notification methods; and outreach materials, such as media kits. Since some stakeholders are anticipated to be involved in several concurrent resiliency efforts, we will look for opportunities to align outreach activities.

VII.B.7., Page 8 We believe the key to a robust JLUS outreach campaign is to offer a mix of face-to-face, web-based, and group meeting platforms. We propose a robust public awareness and engagement process that includes workshops corresponding to Phases 1, 4, and 5 of the project. In addition, we will engage members of the community and stakeholders through small group or neighborhood-based meetings to define areas of concern or explore targeted strategies, particularly with affected property owners and communities. We propose the following core components as part of our engagement strategy and a few optional considerations:

VII.B.7., Page 8 **Website and social media.** We will provide content to post on HRPDC's website and social media accounts. These platforms provide multiple avenues to disseminate information as well as receive feedback from the public. We will discuss opportunities for integrating a survey instrument on the website to solicit community feedback at key points of the process. An outline of the types of content and/or links to them should include:

- Project description overview and images
- FAQs
- Media page (to post press releases and photos)
- Public meeting calendar and schedule
- Contact Us

VII.B.7., Page 8 **Contact List.** It is important to have a current list of stakeholders for the internal working team as well as for the public and media. Our contact list will include community opinion leaders such as JEB Little Creek, NAS, NS commanding and public information officers and Norfolk and Virginia Beach leaders from the elected, planning, public works, economic development, civic, business, education and environmental communities.

VII.B.7., Page 8 **Public Meetings.** Public meetings should be managed to solicit input and provide a form for engagement. Our team will hold three public meetings that correspond to Phases 1, 4 and 5 of the study. We propose to hold one public meeting in Norfolk, one in Virginia Beach, and a third location to be worked out with the HRPDC and JLUS partners. We assume that the HRPDC will identify a suitable location for the public meetings and will cover any potential facility rental costs.

VII.B.7., Page 8 Our team will prepare outreach materials for the meeting from sign in sheets, evaluation forms, and handouts and will prepare a brief summary of the event to document comments. We will prepare two press releases for each of three public meetings and will disseminate them to local media and our contact list. The meeting information will also be posted on online media community calendars.

VII.B.7., Page 8 To increase participation and access to information, we recommend that virtual meeting platforms such as

GoToMeeting.com or join.me be considered. We will collaborate with HRPDC to plan the logistics of offering this option to the public. We have the capability to have sign language interpreters at each meeting for the hearing-impaired as well as Spanish-language translators, as needed.

Optional Considerations for Public Meetings
(not included in cost proposal)
We recommend that HRPDC consider placing paid public notices in publications such as the *Virginia Beach Beacon* and the *Norfolk Compass* as well military publications such as *Soundings*. The ads will run twice in each publication before each public meeting.

We recommend that meeting notices be placed in utility bills that go to residents. We would collaborate with HRPDC's marketing team on appropriate content for the notices.

VII.B.7., Page 8 **Stakeholder interviews.** We have a readily available and extensive list of Norfolk and Virginia Beach opinion leaders from the military and elected officials to faith-based leaders. We will review this list with the JLUS partners to identify a list of approximately 30 prospective stakeholders that will be interviewed during Phase 2 of the study. The list would be submitted for approval by the JLUS Policy Committee before anyone is contacted. Key information that we intend to discuss in these interviews are issues that stakeholders are facing regarding recurrent flooding, coastal storms and storm surge, and erosion; impacts to key sectors such as transportation infrastructure, water delivery and wastewater, communication, private property, natural resources/marine environments; strategies and recommendations developed in previous studies; and overall, how incompatible community development currently impacts military operations.

VII.B.7., Page 8 **Community and Media Relations.** Our team's extensive network of Norfolk and Virginia Beach leaders will serve us well as we build upon these established relationships to more effectively engage the public. We will develop an outreach kit to share with various organizations like the Downtown Norfolk Council, Virginia Beach Vision to help disseminate critical project information. The kit will feature printed and electronic FAQs, sample letters to the editor and how to send them, project timeline, blurbs for the community group's websites, Facebook, Twitter and Instagram social media platforms.

VII.B.7., Page 8 It is vital to reach out strategically to millenials who are the emerging leaders. The Hampton Roads Chamber has a young professionals group, tHRive, that has over 1500 members. These are the types of groups we recommend be included for partnership and community engagement and would receive the kit.

VII.B.7., Page 8 **Installation Tours.** We will explore opportunities with the U.S. Navy representatives and their Public Affairs Officers to integrate installation tours as a component of the outreach strategy. Tours would be promoted through the outreach strategy but managed by each installation to ensure adherence to base access and security protocols.

VII.B.7., Page 8 **Social Media.** We strongly recommend the use of social media platforms to reach the public in a very cost-effective manner. For those who won't or can't attend meetings, we recommend videotaping or providing a link for them view the meetings and post them on the project website, Facebook and Twitter sites. Additionally, we recommend a YouTube Channel with timely posts of project updates and upcoming meetings. Some of the stakeholders could encourage their constituents via videotaped messaging to engage in the public process. Using stakeholders instead of consultants lends much credibility to the messaging.

VII.B.7., Page 8 **Coordination with other JLUS studies.** AECOM team leaders will coordinate through the HRPDC with other concurrent JLUS processes underway or initiated. This coordination will ensure a common understanding of regional factors and influences and can inform strategy development.

VII.B.7., Page 8 **Policy and Technical Committee Meetings.** The AECOM team will conduct regular meetings with the Policy and Technical Committees to ensure ongoing direction at key decision points. Our scope of work and project schedule identifies recommended check in points for these meetings that coincide with project progress milestones.

VII.B.7., Page 8 **Stakeholder and Public Engagement Strategy.** In coordination with key partners, we will formulate an engagement strategy document that details the frequency, timing and methodology for engagement with key stakeholder groups and with the public.

Task 1.3 Data Sharing Platform

VII.B.7., Page 8 Prior to the development of the data collection approach or data sharing platform, the AECOM team will conduct a detailed review of existing available data and past reports. This review will identify the data gaps, sources and sharing requirements of key stakeholders and team members. AECOM has a wide variety of hardware and software tools that can be utilized to meet the data collection and management needs of the JLUS program. One example is Sharepoint, which AECOM has used successfully to manage complex project data and documents for previous DoD and municipal projects. It is a secure web-based FTP site that allows customizable restricted user access to upload, view, modify and download copies of data and documents during this study. This type of data management solution streamlines the data sharing and submittal process, offering ease of access and time savings.

Task 1.4 Public Meeting #1

VII.B.7., Page 8 The first public meeting will introduce the public to the JLUS process and purpose of the study, the JLUS partners and committee structure, and how to provide input during the study. We recommend the first meeting include an overview of how other recent technical studies and recommendations will inform the JLUS and an introduction of how the challenges of flooding, coastal storms, and erosion are impacting Navy operations at the four installations. This overview will help explain how the JLUS builds upon the region's significant progress on issues of resiliency while clarifying the expanded role of the JLUS to consider military readiness. We will work with the JLUS partners to develop the presentation and materials. We have found that an open house format with a scheduled presentation works well for the first meeting and allows participants an opportunity to view maps and ask questions of the planning team.

Phase 1 Deliverables

- Project Kickoff Meeting
- Project Work Plan & Schedule
- Public Engagement Strategy Document
- Summary of 1st Public Meeting
- Data Management Solution

Phase 2 – Information Gathering and Assessment

VII.B.7., Page 8 The wealth of existing, peer-reviewed and vetted data, in combination with the informed and diverse perspectives of the various stakeholders to be interviewed, will form a solid foundation on which to base the analyses and integrated planning efforts. Ultimately, the study's data-driven, stakeholder-involved recommendations will help to create, over time, a resilient community capable of accommodating moderate flooding events and efficiently recovering from major coastal storms.

Task 2.1 Data Collection

VII.B.7., Page 8 In addition to the existing resources and documents listed in Attachment 2 of the RFP, our team will collect available and relevant data on growth trends, current and proposed land use and development policies, building and floodplain codes, zoning, encroachment program efforts, local and regional transportation infrastructure, utility networks, watershed studies and hazard mitigation plans. This effort will include collection of available GIS layers from the JLUS partners as well as other state and federal resources as applicable. Our understanding of local Navy infrastructure, missions, and challenges will be an asset in the dialogue with Navy leadership about data sources. We understand the sensitive nature of DoD data and will offer ideas on how to bring relevant information forward in a way that does not compromise security or safety concerns for the bases.

VII.B.7., Page 8 Since around 2008, the number of studies, models, vulnerability estimates, and future projections of SLR has grown enormously. The AECOM team already has access to or has been involved in the development of locally-focused data that will be needed to support the JLUS. Additional existing data sources will be identified and created through the course of the project.

VII.B.7., Page 8 The Data Collection task will catalog and map (where appropriate) available existing data and reports that can be used to inform subsequent phases of analysis and plan development; where existing report findings aren't yet digitized or readily mapped in detail, the information can be included in the maps as polygons and call-out boxes. For vulnerability assessment and resilience zone delineation, we will use recently updated 2014/2015 FEMA Flood Insurance Rate Maps and Flood Insurance Studies in addition to Sea Level Rise studies. To augment the analyses, historical flood data, such as high tide and storm surge, high water marks, flood damage assessment, and street closures will be collected from various sources, including but not limited to NOAA, NWS, City and county emergency management agencies, and the National Climate Data Center.

VII.B.7., Page 8 The aim is to view as much of the available information as possible spatially to aid in understanding relationships, cross-connections and interdependencies between the many varied land uses. This spatially driven approach will also aid in identifying knowledge gaps that need to be filled during the study. Understanding that mapping such multiple and diverse data sets can quickly become unwieldy, the AECOM team's experienced planners and GIS analysts will develop a balanced set of data display products to convey the issues and potential strategy solutions succinctly.

Task 2.2 Stakeholder Interviews

VII.B.7., Page 8 To obtain input on critical assets and resources that support the military and the communities of Norfolk and Virginia Beach and to help us understand interdependencies, stakeholder interviews are vital. We propose to conduct interviews during a one week listening tour to increase efficiency and maximize participant's time. Some interviews could be conducted as small focus groups and, depending on the number of folks identified; we can field up to two teams for interviews. Potential stakeholders could include:

- City of Norfolk and Virginia Beach elected and appointed officials
- Commanding Officers from JEB Little Creek-Fort Story, NAS Oceana, NS Norfolk, and NSA Hampton Roads
- Navy Installation Departmental staff: Community Planning and Liaison Officers, Asset Management, Public Works, Planning
- City Planning Directors and Resiliency Officers
- City of Norfolk and Virginia Beach Departmental Leaders (Development, Strategic Growth, Public Works, Transportation, Economic Development, Utilities, Emergency Communications, Emergency Preparedness, etc.)
- Virginia Beach Economic Development Authority
- Hampton Roads Planning District Commission
- Port of Virginia
- Utility Providers
- Hampton Roads Transportation Planning Organization
- Hampton Roads Transit Authority
- Hampton Roads Chamber of Commerce
- Hampton Roads Military and Federal Facilities Alliance
- Virginia DOT
- U.S. Army Corp of Engineers
- Academic institutions (i.e., Old Dominion University, etc.)

VII.B.7., Page 8 This list is not intended to be exhaustive but is indicative of the types of opinion leaders that must be included in the outreach strategy. Our proposal assumes that HRPDC would assist AECOM with logistics and the scheduling of interviews. The

interviews could be held in a central location in each city – e.g. Norfolk City Hall and Virginia Beach Town Center. The input received from the interviews will be used to prepare a summary list of challenges and opportunities and preliminary analysis diagrams, as applicable.

Task 2.3Technical Committee Meeting

VII.B.7., Page 8 We will hold a meeting with the Technical Committee to share a summary of findings from the stakeholder interviews and discuss any important data gaps.

Phase 2 Deliverables

- Reference list of documents/reports collected
- Final Stakeholder List and Schedule of Interviews
- Stakeholder interviews (one week)
- Data gap list
- Data Management Solution

Phase 3 – Analysis

Task 3.1 Establish Resiliency Analysis Zone

VII.B.7., Page 8 Some areas of the geographic study area may be more vulnerable than others to frequent flooding, storms, erosion and sea level rise. Recognizing this, we propose a two-step process for defining a resiliency impact area based on available FEMA Flood Insurance Rate Maps (FIRMs), historic documented flood impact data, disaster damage assessments, SLR projections, and information gained from stakeholder interviews and studies. The outcome of this task will be the lens through which a broader compatibility analysis will be performed under this Phase.

VII.B.7., Page 8 We understand that SLR projections are dynamic and there is concern in the scientific community that consensus projections in the latest IPCC and the National Climate Assessment are low. The decision which SLR values to include in the JLUS will be made in collaboration with the Technical and Policy Committees and should take into account the planning horizons that HRPDC, the Cities, and the Navy may have for future planning, which are likely to differ from each other.

VII.B.7., Page 8 ***Step 1: Establish a baseline SLR metric.*** Various agencies have studied and published SLR projections with much more effort expended in the past 10-15 years. To integrate SLR into the analysis, we propose to consider a range of SLR by selecting two or three different SLR values that bracket the range of projections published by reputable agencies. For example, 1.5 feet of SLR approximately represents the USACE / VIMS low estimates at 2100, USACE/NOAA mid-levels at 2065, and the USACE/NOAA/VIMS highest for the 2035-2040 timeframes. Selecting 3.0 feet of SLR can represent years from 2055 to 2075. If year 2075 is deemed a sufficient future planning horizon for this JLUS, then these two SLR values would be sufficient. This method has been proposed and agreed to for the ongoing Norfolk Harbor/Elizabeth River channel deepening feasibility studies.

VII.B.7., Page 8 ***Step 2: Define a resiliency analysis zone that shows an adjusted future inundation area.*** After SLR is determined, tide and storm surge elevation grids for events included in the vulnerability analysis will be integrated into the future SLR values. We will overlay the SRL and storm surge elevation with FEMA FIRM mapped data to delineate a resilience zone. Executive Order (EO) 13690, Federal Flood Risk Management Standards, require federal agencies to comply the EO using best-available, actionable data and methods that integrate current and future changes in flooding based on science, or simply use 500-year flood elevation. We will apply either best available flood data or 500-year elevation to draw worst case scenarios. This information will be formulated into layers for use in GIS and depicted spatially to convey the current baseline condition and a projected condition that together form the resiliency analysis zone.

Task 3.2 Land Use and Military Operations Compatibility Analysis

VII.B.7., Page 8 A review of existing plans is a very important foundational step for developing the JLUS, in order to continue and build on current initiatives and use best practices for the community as catalysts for further progress towards resilience.

VII.B.7., Page 8 The AECOM team will conduct a thorough review of existing plans and growth-related GIS data for the four Navy installations, City of Norfolk, City of Virginia Beach and the region, including zoning ordinances and Comprehensive Plans, and Navy technical studies. AECOM is well-positioned for this task: we prepared the 2005 JLUS for NAS Oceana, NALF Fentress and Chambers Field , the NAS Oceana Installation Development Plan (including support sites Dam Neck Annex and NALF Fentress), the Dam Neck Annex Encroachment Action Plan, and a Sustainability Pilot Project for JEB Little Creek-Fort Story. In addition, we are currently preparing the Naval Station Norfolk Installation Development Plan and the JEB Little Creek-Fort Story Installation Development Plan.

VII.B.7., Page 8 Changes in regulations and policy such as the new Federal Flood Risk Management Standard (FFRMS) and DoD, DOT, and HUD policies will affect future investment and funding opportunities. Federal and state laws and regulations, Executive Orders, and military directives and instructions will be reviewed to determine the potential impact between study area land uses and base operations and land uses. Recent major construction or improvement projects as the installations will be identified and noted along with any proposed physical improvements that are planned in support of mission growth. The AECOM team also prepared the Regionalized Sea Level Change and Extreme Water Level Scenarios tool as part of the Coastal Assessment Regional Scenario Working Group (CARSWG) for the SERDP/ESTCP JV effort to understand the implications on Navy bases globally.

VII.B.7., Page 8 Both the City of Norfolk and Virginia Beach have recently adopted or revised their Comprehensive Plans which will serve a

primary input to the analysis along with Norfolk Vision 2100 that outlines where the city should grow in the future in response to flooding and rising seas. These documents and others prepared by the HRPDC, Hampton Roads Transportation Authority, and local utility providers will be carefully reviewed to understand growth objectives and to extract potential compatibility issues. We will also gather available demographic and population projection data to develop the current and future growth concepts for the study area and reports related to the economic impact the military has on the region.

VII.B.7., Page 8 We understand that significant progress has been made in addressing encroachment related to land use, noise, economic concerns of the surrounding communities since the 2005 JLUS for NAS Oceana, NALF Fentress and Chambers Field was completed. We will collect available data on remaining incompatible development in consultation with the cities and collect available data on remaining conflicts and statistics such as those referenced in the Progress Reports for the NAS Oceana Encroachment Reduction Program.

VII.B.7., Page 8 Using collected data, the AECOM team will develop a series of GIS-based maps showing current conditions and foreseeable future conditions for the study area. GIS layers will incorporate existing and future/proposed land uses and growth areas, zoning, roadway and transit networks, infrastructure (water, sewer, stormwater, communications), planned capital improvements, political boundaries, zoning, noise contours, controlled airspaces, accident potential zones (APZs) radar vectoring areas, and environmental constraints and resource conservation areas.

Task 3.3 Technical Committee Meeting

VII.B.7., Page 8 Members of the AECOM team will meet with the Technical Committee to present the results Tasks 3.1 and 3.2 and obtain feedback on any suggested modification to the process and findings. We will also develop a list of asset categories for our work in Task 3.3.

Task 3.4 Asset Identification Strengths/Weakness/Opportunity/Threat (SWOT) Analysis

VII.B.7., Page 8 The AECOM team will work with the Technical Committee to develop a list of asset categories that will be included in the vulnerability assessment. In the interest of time and budget, typically critical facilities and infrastructure and the most vulnerable populations are included. Cities often start from a list of critical assets included in a Hazard Mitigation Plan. A Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis will be used to inform asset criticality, priority and the asset groups used in the vulnerability assessment. As part of this task, we propose to collect the following information in GIS for each asset (where available):

Exposure: Location and elevation
Sensitivity: Critical functionality of the facility or building to military operation, community service, local economy and long term resilience
Adaptive capacity: feasibility of incorporating adaptation techniques or mitigation measures (physical or policy related)

VII.B.7., Page 8 We will work with the Navy to determine what information can be appropriately referenced for this exercise. One approach may be to consider the broad facility classification of Shore Capability Areas. We will provide a prioritized list of Navy, governmental, and private facilities and building where adaptation measures can be incorporated. This task will note if there are any gaps where no current or very limited information exists along with key actors and decision makers that will need to be involved in preparedness strategy development and implementation.

Task 3.5 Development and Floodplain Code Assessment

VII.B.7., Page 8 A powerful and proven strategy for enhancing resilience to flooding and sea level rise is to inventory and analyze land development codes for the City of Norfolk and the City of Virginia Beach and facility planning and design standards for Navy installations with regard to managing flood risk. As this is likely a large body of regulations, we propose a focused review in specific areas that have been identified as currently contributing to flooding and land use incompatibility issues inside and outside the fence, or have the future potential for exposure.

VII.B.7., Page 8 The AECOM team will request information on a variety of “capability indicators” to include existing Federal, state, regional and local plans, codes, policies, programs, and ordinances that affect flood hazard vulnerability either directly or indirectly. Assessment of these documents will provide an opportunity to identify capability gaps or distinct opportunities for policy-related or administrative programs that may improve resiliency with regard to repetitive flooding, sea level rise and coastal erosion. Focus will be on regulations affecting land use, development and redevelopment in flood hazard areas of the JLUS study area. At a minimum, the assessment will include:

- Flood damage prevention ordinances;
- Virginia Uniform Statewide Building Code;
- Zoning ordinances;
- Subdivision ordinances;
- Comprehensive plans;
- Administrative procedures for ordinance implementation;
- Emergency Operations, Disaster Recovery and Continuity of Operations plans;
- Hazard Mitigation plans;
- Community Rating System submittals and related documents;
- Virginia Stormwater Management Act; and
- Chesapeake Bay Act.

VII.B.7., Page 8 This task will include discussions with administrators in Norfolk, Virginia Beach, HRPDC and the Commonwealth of Virginia, as necessary, to determine specific aspects of regulatory processing, implementation and updating. We will identify capability

gaps and flood-related mitigation opportunities through a comparison of local programs with nationwide guidance documents on flood and sea level rise mitigation.

Task 3.6 Composite Vulnerability and Interdependencies Assessment

VII.B.7., Page 8 As described in 3.3, a vulnerability assessment will be performed for critical assets and asset groups based on the hazard scenarios defined and using information collected on those assets. The results of this analysis, which will identify the highly vulnerable assets, will be compared to results from previous studies and the regional issues maps prepared to validate findings and establish the basis for future recommendations. We will also compare these results to areas identified as currently impacting military operations or readiness to understand how the more highly vulnerable areas may relate and impact future military operations. The result will be a spatial understanding of areas where adaptation strategies are most needed.

VII.B.7., Page 8 Utilizing the results from the composite assessment, our team will identify remaining data gaps, and develop a ranking for the impacts criteria and potential weighting of criteria to reflect any impact on military operations and importance to the community.

Task 3.7 Technical Committee Workshop

VII.B.7., Page 8 Members of the AECOM team will hold a 1.5 day workshop with the Technical Committee to present the results Tasks 3.3, 3.4, and 3.5. A key objective will be to review and confirm the prioritization of issues with the Committee. The afternoon of the first day will include a presentation of the analysis findings and a discussion with the group to validate the findings to ensure all issues are comprehensively documented. The second day will bring together multiple disciplines to discuss and brainstorm potential solutions (programs, policies, projects) for identified vulnerability and compatibility issues discussed on day one and define draft evaluation criteria that will guide the next phase of work.

In preparation for day two of this workshop, the AECOM team will research best practices that address typical structural issues from an urban design perspective to illustrate the concept of co-benefits. This may include example imagery from other recommendations in recent studies in the area, sketches of design solutions from other similar projects, and/or rough sketches representing ideas for specific vulnerability issue areas in the study area. The team will present this information and facilitate a discussion with the committee intended to develop preliminary evaluation criteria that reflect community and navy priorities and values. This discussion will also help vet ideas that are acceptable to the partners that can carry forward into the next phase.

Phase 3 Deliverables

- Existing condition memo summarizing land use, development conditions, and resiliency factors
- Asset inventory table (excel spreadsheet) containing all available relevant data for each asset group required to assess asset exposure, sensitivity and adaptive capacity. Specific data varies with each asset and asset group.
- Guidance document on gap analysis and adaptive capacity for each asset type
- GIS mapping of key assets compared to selected hazard scenarios to inform vulnerability assessment
- Summary of land development regulations (municipal and DoD) and administration thereof, capability gaps, mitigation opportunities, and preliminary recommendations for implementation
- Presentation of best practice design-related solutions as part of Technical Committee workshop

Phase 4 – Development of Recommendations and Strategies

Task 4.1 Develop Adaptation Strategies and Link with Funding Opportunities

VII.B.7., Page 8 The work in Phase 2 (Data Collection and Stakeholder Interviews) and Phase 3 (Analysis and vulnerability assessment) will establish the factual basis for developing meaningful resilience strategies that will reduce risk and enhance the military operations as well as improve safety for the military, residential, commercial, and industrial assets in the Hampton Roads area. Using the objectives identified in the Project Kickoff (Task 1.1), our team will utilize a proven multi-step process to develop a customized adaptation plan that incorporates both mitigation and adaptation strategies for municipalities and military facilities alike and that area applicable at the site, neighborhood, community, and regional scales.

Identify Potential Adaptation Measures

VII.B.7., Page 8 Building on the findings from the data collection and analysis phase, an understanding of the local and regional issues learned from stakeholders and the public, the asset vulnerability assessment, and the development and floodplain code review, evaluation criteria will be refined to inform and evaluate mitigation measures and adaptive strategies. Military assurance and operational readiness are important factors that will be included in the evaluation criteria.

VII.B.7., Page 8 For each identified hazard and associated risk, such as coastal flooding, sea level rise and erosion, the project team will identify adaptation measures that will reduce or eliminate the risk. Observed adverse impacts from coastal flooding and storm events include but are not limited to:

- Failing bulkheads and repeated flooding of buildings and roadways
- Accessibility issues to/from installation / facilities during high water events
- Increasing wetland encroachment on existing facilities and limited developable areas
- Undersized and under maintained stormwater management infrastructure
- Saturated soils / sinkholes / water intrusion in foundations / increased foundation requirements.

- Utility line, facility, and equipment corrosion due to salt water exposure
- Utility and critical infrastructure degradation due to age and maintenance
- Ship/aircraft relocation during storm events – impact on readiness, personnel impact

VII.B.7., Page 8 The study will emphasize, but will not be limited to, actions that affect existing and future structures, infrastructure and land use. Adaptation measures might include retrofitting of structures or construction of smaller scale floodwalls in hazard-prone locations and/or modification of procedures and policies.

VII.B.7., Page 8 These projects may be non-structural (e.g. land use plan, capital improvement plan, Continuity of Operations, innovative landscaping, shoreline protection, aquaculture, regulatory measures, property relocation incentives) or structural (e.g., seawalls, dams, dikes, wetland enhancement, structural retrofitting) solutions. At a minimum, this list of prioritized adaptation measures will be based on a process that results in identification of cost effective adaptation projects with planning committee and public inputs. We will build on strategies suggested during the workshop in Task 3.7, and measures recommended from previous studies such as the HRPDC Land and Water Quality Protection reports, HRPDC Military Transportation Needs Study, and Norfolk Resiliency Strategy.

Evaluate & Prioritize Potential Adaptation Measures

VII.B.7., Page 8 The potential mitigation measures and adaptive strategies identified in the previous step will be evaluated for applicability and prioritization. Evaluation criteria will be refined and may include elements of STAPLEE evaluation criteria developed by FEMA for Hazard Mitigation planning, military operational needs, and other cost based indices including return on investment (ROI) and benefit-cost. The prioritization of mitigation actions will include consideration of relative costs and benefits, identification of parties responsible for implementation, potential funding mechanisms, and timelines for implementation.

VII.B.7., Page 8 In order to efficiently provide a high level understanding of the potential impact of failing to implement the agreed priority strategies, we will prepare a simplified analysis of the potential economic impact of a hazard event on the Virginia Beach-Norfolk-Newport News Metropolitan Statistical Area (MSA) using readily available data from the Bureau of Economic Analysis (BEA) on the number of employees and their compensation by industry for the most recent year for which data is available. We will suggest a hypothetical hazard event type and characteristics (i.e., area impacted, magnitude or severity, and length of impact), as well as associated direct impact on an estimated percentage of the MSA's employees by industry and their associated compensation (i.e., employees unable to work, person hours lost, and compensation potentially lost), and indirect impacts will be estimated using a relatively simple measure, such as multiplying the direct impacts by 2.0, adding the direct and indirect impacts together for an estimate of economic impact from the event.

VII.B.7., Page 8 We propose to develop high level Rough Order Magnitude (ROM) costs for up to 15 priority structural projects, using cost data from comparable projects and other industry benchmark data. Mitigation measures and adaptive strategies (structural and non-structural) that are inconsistent with JLUS partner priorities as revealed during the stakeholder meetings will be eliminated from further consideration. The focus will be on mitigation measures and adaptive strategies that offer the maximum benefit and that meet the goals and objectives for the region, for the municipalities and for the military bases in the study area.

Task 4.2 Develop Integration and Implementation Strategy

VII.B.7., Page 8 The plan will include a strategy for integrating the recommended adaptation measures into other planning mechanisms such as public works manuals, stormwater management plans and local zoning and development regulations. The purpose of integrating the recommendations of the adaptation plan into other planning mechanisms is to leverage those other resources to further reduce risk. Linkages that are key or critical will be determined in Phase 2, during the Stakeholder Interview process, and confirmed in this step.

VII.B.7., Page 8 Initial adaptation strategies will be focused on the planning horizon determined by the JLUS Policy Committee. However, due to the unpredictable nature of SLR in both timing and amplitude/elevation, this plan will be designed as a "living" plan that itself will be adapted going forward, as estimated rates of SLR are borne out by actual measurements over time, and as industry/scientific guidance evolves such as IPCC, USACE, National Climate Assessment (NCA3), and NOAA SLR projection updates. The goal is to recommend mitigation measures and adaptation strategies that are flexible and adaptable to changing conditions so that they can be easily retrofitted to accommodate future conditions.

VII.B.7., Page 8 For the adaptation measures that are appropriate for the HRDC and the military installations, the study will present an implementation strategy that identifies the responsible party for implementation, a timeframe for implementation, and potential sources of funding. For a plan to be more than a document on the shelf, it must be structured and presented in a way that is easy to understand, action oriented, engages different types of stakeholders in different forums, educates them on specific vulnerabilities that apply to them and gives tangible reasons why it matters. This process begins with the stakeholder interviews in Phase 2 and will continue throughout the study with key meetings and interactions with the JLUS Policy Committee and stakeholders. For the plan to be successful, elected officials, local government staff, general public and interest groups must buy into and believe in it. The specifics of the plan must also be presented to state and federal leaders in a way that garners their interest, underscores financial sustainability and minimizes components that are politically difficult.

Example AECOM project for a confidential client's facility risk assessment and climate change adaptation measures, including land use plan update, Stormwater management, emergency preparedness plan, protection of hazardous materials and installing flood gates and pumps.

VII.B.7., Page 8 The implementation strategy will also include recommended tools and methods to maintain collaboration between key stakeholders in the region. This process driven approach will establish a structure and forum which incentivizes stakeholder participation and accountability for enhancing regional and local resilience. The entity that is formed as a result of this effort would be responsible for hosting regular meetings to establish actions and document progress towards achieving established goals. To accommodate changes in

physical and climate conditions, political climate, funding, municipality growth and military mission, such an entity and its mission statement would be inherently flexible and /adaptable.

VII.B.7., Page 8 The implementation strategy will identify potential funding streams and consider and match up to existing or highly probable funding programs. AECOM has extensive experience with grant programs available from FEMA, HUD, USDOT, USACE, EPA, NOAA, and many other agencies. AECOM' grants management specialties are built on broad technical expertise in the following grant-related areas:

- Resilience and climate change adaptation,
- Infrastructure, such as bridges, water-wastewater management, roads and stormwater management systems.
- All-hazards mitigation projects and planning
- Risk and vulnerability assessments
- Environmental and sustainability planning
- Land Use and capital improvement planning
- State, Regional, and Local Emergency Response and Recovery

VII.B.7., Page 8 The findings and recommendations will be documented in a draft *Strategy Recommendation and Implementation Plan*.

Task 4.3 Technical and Policy Committee Workshop
VII.B.7., Page 8 The findings from task 4.1 and 4.2 will be presented to the JLUS Technical and Policy Committees during a half day workshop. AECOM will facilitate a discussion and review of the draft strategies and organize workshop activities to include prioritization exercises. In preparation for this workshop, the AECOM team will prepare a series of illustrations to depict priority structural project types in general relationship to local conditions. For budgeting purposes, we have estimated preparing up to 8 illustrations (artistic or photo realistic renderings) to help convey solutions that achieve multiple benefits sought by the JLUS partners. AECOM will facilitate a review and discussion of the strategies and their evaluation ranking outcome. Following the meeting and feedback from the JLUS partners, the AECOM team will refine the draft strategies (eliminate, add, revise) and associated evaluation rankings and prioritization levels.

Task 4.4 Public Meeting #2
VII.B.7., Page 8 The AECOM team will hold a second public meeting to report findings from first public meeting, summarize the findings and initial recommendations from data collection and analysis tasks, and solicit additional feedback on possible strategies to consider. The public meeting will be conducted as a workshop with interactive breakout sessions to review known risks and engage the public so that they become part of the strategy development in order to improve the regional support for the final plan. Illustrations prepared as part of task 4.3 will be integrated into the presentation.

Phase 4 Deliverables
Draft strategy recommendations and implementation plan
Summary of second public meeting/workshop

Phase 5 – Plan Completion + Adoption

VII.B.7., Page 8 Based on the input from the JLUS draft recommendations review and the public and stakeholder input from Phase 4, the findings and recommendations will be refined and presented in a complete draft report and presented to the JLUS Technical Committee and then the Policy Committee for review and comment. AECOM will develop a Plan Outline for review and approval at the outset of this task. In addition, AECOM will participate in up to 3 meetings (aligned with other JLUS committee meetings) or conference calls to coordinate across the concurrent JLUS efforts in the region.

Task 5.1 Prepare Draft JLUS Plan and Present to JLUS Committees
VII.B.7., Page 8 AECOM will assemble all interim deliverables into a draft report format and circulate to the Technical and Policy Committees, as well as other agencies as indicated, for review, comment and revisions. We will present the Draft Plan to the Technical and Policy Committee for review before the plan is released by HRPDC for public review and comment.

Task 5.2 Public Meeting #3
VII.B.7., Page 8 The AECOM team will hold a public meeting to present the recommendations of the JLUS and solicit feedback. We assume that HRPDC will serve as a central repository for public comment and will forward a consolidated comment matrix to AECOM at the conclusion of the public review period.

Task 5.3Prepare Final JLUS Plan and Conduct Briefings
VII.B.7., Page 8 Following review of the draft report, we will revise and finalize the document based on comments received from the public, Policy and Technical Committees and other local and federal agencies, as appropriate. We will present the Final Plan to the local jurisdictions and the HRPDC for formal adoption and propose to brief Navy installation leadership in a combined meeting.

Phase 5 Deliverables
- Draft JLUS (and implementation plan) - electronic and 15 copies
- Final JLUS (and implementation plan) - electronic and 20 hard copies
- Final Presentations to Norfolk, Virginia Beach, HRPDC and Navy

Phase 6: Preliminary Design – Optional Phase

The priority strategy recommendations will be formulated during Phase 5 of the project. In an effort to build broader consensus and momentum toward implementation, the AECOM team will provide assistance to the HRPDC in advancing design concepts for up to three structural projects. Because the type, scale, and design criteria for the projects are unknown at this point in the process, AECOM has assumed a total allowance budget of $50,000 that could be used toward this effort. While more detailed discussions will be needed to fully articulate the scope of work for this task, the following assumptions can be assumed for this work effort.

- Conceptual design of a stormwater management or flooding mitigation project typically includes developing very approximate dimensions and alignments of the main project features. When pump stations or other mechanical systems are involved, the number and sizes of the pumps (or gates, etc.) required to achieve the project goals are typically estimated at conceptual design stage. The conceptual design products contain a set of drawings that typically include:
    - Base map information displaying existing topography, existing structures and infrastructure, and existing utilities. "Existing" conditions may include items that are not yet present but which can be known or confidently assumed to be implemented in the project area. Aerial images may or may not be included in the base map.
    - An approximate layout of the conceptual design project components. The aim of the conceptual design layout is to show the dimensions of each component (for ROM cost development) and how the components relate to each other and to existing features (such as structures, infrastructure and utilities).
    - A small number of typical cross-sections (i.e. profiles or elevation views) sufficient to illustrate the significant project components. The cross-sections provide additional information for ROM cost development, and they help illustrate how the project will look from ground level.

Artistic or photo-realistic renderings of the project or parts of the project can be developed to help various audiences visualize how the project will fit into the existing environment – not only how it will fit into (or alter) the viewshed, but also how the project may impact daily activities and how the project will benefit the community.

A "basis of design" summary will be provided for each conceptual design that documents the various assumptions made during design development, approximate quantities for ROM cost development, and an outline of additional information, studies, etc. that are likely required for taking the project further into preliminary and final design.

The following additional assumptions and limitations apply to the development of conceptual designs as part of this phase:

- No new topographic or hydrographic surveys will be completed. It is assumed that existing, available data sets (such as the topographic surveys and LiDAR elevation data sets held by the Cities) remain applicable and, compiled together, adequately describe the existing conditions upon which the conceptual designs will be based.
- No new above-ground surveys of utilities or Sub-surface Utility Exploration (SUE) is included. Instead, the conceptual design base map will include locations of existing utilities provided to the project team in georeferenced digital format (i.e. CAD files, GIS shapefiles or geodatabases) by HRPDC, the Cities, and/or the various utility services (e.g. Dominion, VNG, HRSD, etc.).
- No new geotechnical investigations or wetland delineations will be conducted. For conceptual design purposes, geotechnical and environmental considerations will be based on assumptions guided by prior experience with the available, existing information in the project region.
- It is assumed that the HRPDC and the Cities will provide all relevant topographic and geotechnical data that they holds within the study area, and that the Cities will provide up to date GIS files for the storm water collection system and hydraulic structures within the study area.
- Only very limited calculations on structural members, geotechnical foundation stability, and electrical / mechanical components will be included in the conceptual design. Instead, the conceptual design development will make use of knowledge and element sizing from similar projects in this or a similar region, both to illustrate the concepts and to develop ROM costs.
- While ROM costs for the conceptual design is part of the larger scope of work, the scope does not include completion of a detailed Benefit Cost Analysis (BCA) such as would be sufficient to seek USACE or FEMA funding support for project construction.
- The "without project" and "with project" flood impacts analyses in the present scope of work do not include assignment of monetized economic impacts of flooding and economic benefits of the conceptual mitigation alternatives. Economic impact / benefit calculations could be part of a subsequent scope of work to advance one or two preferred alternatives.

Project Schedule

VII.B.8.Provide a detailed project schedule to complete the tasks listed in the Scope of Services.

VII.B.8., Page 9 The overall project (phases 1 through 5) will be conducted over a 21 month period as shown below in the diagram. Based on our JLUS experience, we have found there is some overlap among the phases of work and that the final phase (plan completion and adoption) requires ample time to allow public review, committee consultation and document revisions. Therefore we have reflected a slight shift in the schedule noted in the RFP to allow more time for this important consultation phase. As with any public planning process, we are flexible and will work with HRPDC to define a schedule that works best for all JLUS partners.

Phase 1 Preparation: Months 1-3

Phase 2 Information Gathering and Assessment: Months 2-6

Phase 3 Analysis: Months 6-11

Phase 4 Development of Recommendations and Strategies: Months 11-15

Phase 5 Plan Completion and Adoption: Months 16-21

Phase 6: Preliminary Design – Optional Phase : TBD