STORM WATER MANAGEMENT AT FEDERAL FACILITIES & ON FEDERAL LANDS IN THE CHESAPEAKE BAY WATERSHED

A Report Fulfilling Section 202(c) of Executive Order 13508

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Report Team Coordinated by: U.S. Department of the Defense

Disclaimer:

This draft document is the Department of the Defense's (DoD) current draft report under Section 202c of Executive Order 13508 (EO) making recommendations to the Federal Leadership Committee (FLC) for a strategy to strengthen storm water management practices at Federal facilities and on Federal lands within the Chesapeake Bay watershed. DoD intends to release this draft document to the public concurrently with its submission to the FLC. After the FLC has considered this draft, along with the other draft reports prepared pursuant to the EO, it will prepare a draft strategy to restore the Bay and publish it in the Federal Register for public comment. The current draft report includes preliminary recommendations which may change as the draft strategy is developed. This draft document is not a final agency action subject to judicial review. Nor is this draft document a rule. Nothing in this draft document is meant to, or in fact does, affect the substantive or legal rights of third parties or bind DoD.

The charge from Executive Order 13508:

Section 202. *Reports on Key Challenges to Protecting and Restoring the Chesapeake Bay.* Within 120 days from the date of this order, the agencies identified in this section as the lead agencies shall prepare and submit draft reports to the (Federal Leadership) Committee making recommendations for accomplishing the following steps to protect and restore the Chesapeake Bay:

> (c) Strengthen storm water management practices at Federal facilities and on Federal lands within the Chesapeake Bay watershed and develop storm water best practices guidance;
>
> The EPA shall be the lead agency for the development of the storm water best practices; the DOD shall lead on storm water management practices at Federal facilities and on Federal lands. The lead agencies shall provide final reports to the Committee within 180 days of the date of this order.

This report fulfills the DOD's responsibility for providing recommendations to strengthen storm water management practices at federal facilities and on federal lands within the Chesapeake Bay watershed. EPA is developing a storm water best practices guide in a separate document entitled Technical Guidance on Implementing the Storm Water Runoff Requirements for Federal Projects under Section 438 of Energy Independence and Security Act.

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I. Executive Summary

Executive Order (EO) 13508 calls for the development and implementation of a coordinated Federal strategy to expand and bring greater accountability for efforts toward the Chesapeake Bay's recovery. As such, the federal government commits to lead by example and implement a new paradigm for storm water management on all federal facilities in the Chesapeake Bay watershed.

Federal agencies have a variety of facilities in the Bay watershed ranging from highly industrial sites to rural sites. Although federal agencies only own 7.8% of the land, the federal government is the largest single landowner within the watershed. Federal agencies own both developed and undeveloped lands. The federal government owns more undeveloped land but also has substantial pollutant contributions from storm water discharges from urban/suburban lands.

Storm water sources fall into three major categories: storm water discharges from new development and redevelopment projects; storm water discharges from existing facilities and developed lands; and runoff from undeveloped lands. Although a full range of options are currently under consideration, some of the key recommendations that would demonstrate leadership in strengthening federal agencies storm water management practices are provided below.

- **Adopt agency-specific policies** that defines the administrative and management controls needed to comply with the storm water requirements in Section 438 of the Energy Independence and Security Act;
- **Employ Environmentally Sensitive Design techniques for site selection and layout** to facilitate the use of practices that maintain or restore natural hydrology;
- **Upgrade existing storm water management practices and install new practices on existing developed facilities** where technically and economically feasible;
- **Install best management practices to control storm water runoff from existing paved roads**;
- **Institute practices to prevent and control erosion from unpaved roads**;
- **Expand use of land conservation easement programs** to preserve forest land and install storm water management practices; and
- **Improve GIS data on federal land ownership and land use** to allow more effective management of federal lands within the context of the Bay program and aid in implementation of the Bay total maximum daily load**.**

II. Background

The Chesapeake Bay experiences oxygen deficits, excessive levels of chlorophyll a, and lack of water clarity. All of these water quality problems are caused by excessive loadings of nutrients

(nitrogen and phosphorus) and sediments[1]. These sources of impairment have been managed through a combination of regulatory mechanisms and voluntary measures highlighted in the State Tributary Strategies with the goal of attaining water quality standards in the Bay by 2010. Since it is evident that standards will not be attained by 2010, EPA has begun work on the Chesapeake Bay Total Maximum Daily Load (TMDL), which will determine the total allowable loading of specific pollutants that the Bay may receive by combining the allowable loads determined for the 92 separate sub-watersheds that comprise the Chesapeake Bay watershed.[2]

A significant amount of the pollutant loads to the Bay are delivered as a result of storm events which result in discharges of storm water from developed lands and runoff from undeveloped lands. The primary source of these pollutant loadings is runoff from agricultural lands (53% for Nitrogen, 45% for Phosphorus, and 60% for Sediment) followed by storm water discharges from urban/suburban lands (11% for Nitrogen, 31% for Phosphorus, and 19% for Sediment).[3] There are also some loads delivered by runoff from non-agricultural, undeveloped lands such as managed forests and park lands (1% for Nitrogen, 3% for Phosphorus, and 21 % for Sediment). Although runoff from agricultural lands contributes the largest pollutant load, the only source of pollution that is increasing within the watershed is storm water from urban and suburban lands.[4]

Of the 40,960,000 acres in the Bay watershed, federal agencies own 3,187,636 acres (7.8 %). Most of the federal land in the watershed is located in Virginia and West Virginia. Although the amount of land owned by the federal government in the District of Columbia is low by comparison, the federal government owns approximately one third of the land in the District. Table 1 provides the amount of federal land in each state.

Table 1. Federal Land by State[5]

State	Acres
DC	7,946
MD	170,849
NY	2,416
PA	44,377
VA	1,894,151
WV	1,067,897

The largest federal landholder in the watershed is the U.S. Forest Service. The National Park Service, the military services, and the Fish and Wildlife Service also own a substantial amount of land. Table 2 provides the amount of land owned by each federal agency in descending order.

[1] 2009 State of the Chesapeake Bay Program, Summary Report to the Chesapeake Executive Council, May 12, 2009
[2] 2009 State of the Chesapeake Bay Program, Summary Report to the Chesapeake Executive Council, May 12, 2009
[3] 2009 State of the Chesapeake Bay Program, Summary Report to the Chesapeake Executive Council, May 12, 2009
[4] Bay Barometer: A Health and Restoration Assessment of the Chesapeake Bay and Watershed in 2008.
[5] Personal Communication, Renee Thompson, Chesapeake Bay Program Office GIS Division

Table 2. Federal Land by Agency[6]

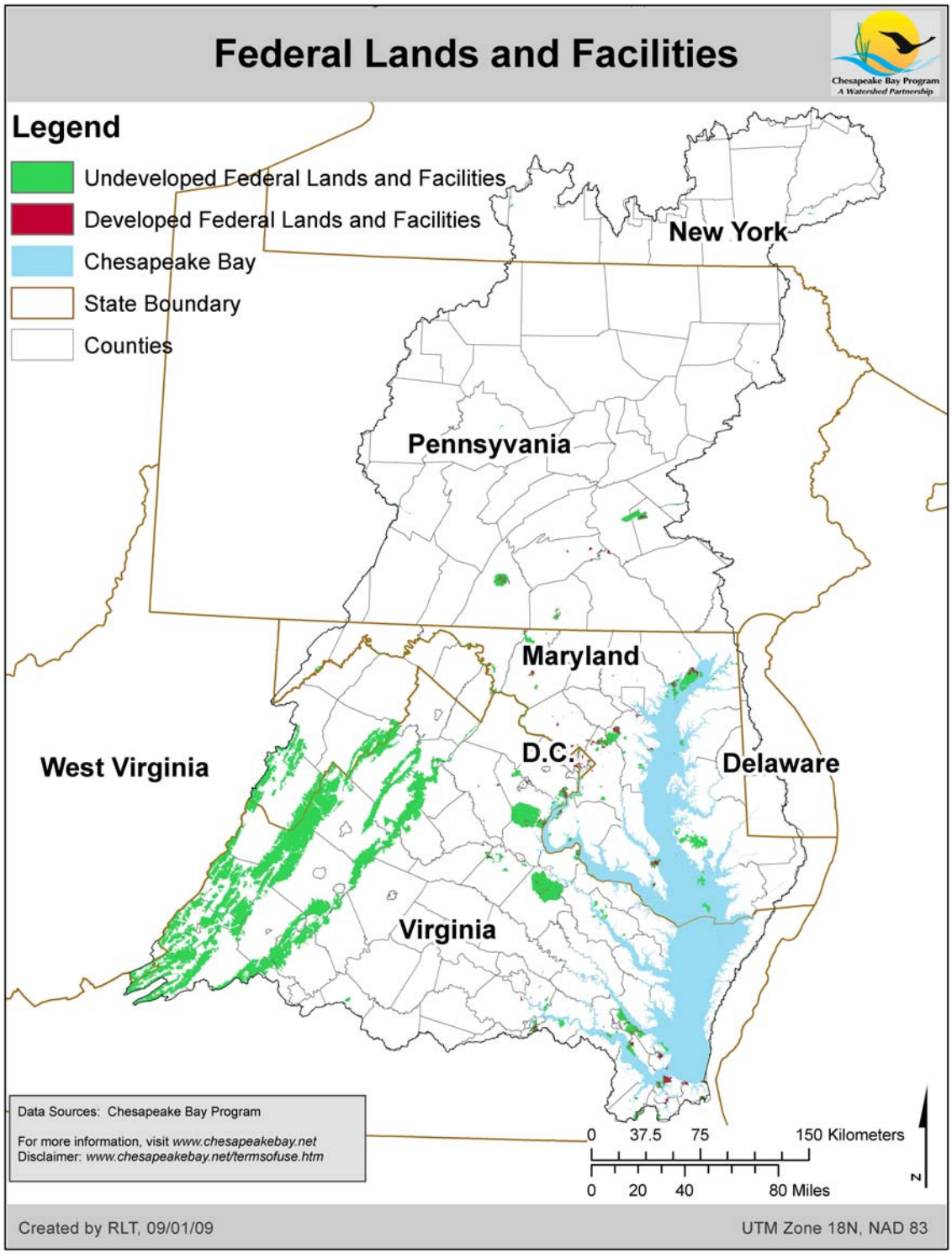
FEDERAL AGENCY	ACRES
US Forest Service	2,298,010
National Park Service	332,726
US Department of the Army	182,461
US Fish and Wildlife Service	150,678
US Department of the Navy	121,366
Federal Unclassified	61,177
Unclassified Military	12,214
US Department of Agriculture	7,675
Smithsonian Institution	5,472
US Air Force	3,804
US Army Corps of Engineers	3,024
US Department of Defense	1,693
Defense Logistics Agency	1,534
General Services Administration	1,271
National Aeronautics and Space Administration	1,091
Department of Interior	1,023
US Department of Veterans Affairs	706
Bureau of Land Management	548
US Coast Guard	363
National Institute of Health	312
US National Guard	273
National Oceanic and Atmospheric Administration	196
Architect of the Capitol	7
US Marine Corps	5
Federal Aviation Administration	2

Note: Data from the Chesapeake Bay Program Office (CBPO) is currently the best available data but it does not appear to be complete based on DoD, USFS, NPS, and NOAA review. DoD is providing updated data for its lands to the CBPO. All federal agencies should provide real estate data to the CBPO so that federal landholdings can be accurately defined in a geospatial format.

Federal agencies own both developed and undeveloped lands in the Chesapeake Bay watershed. Approximately 4,255,161 acres (10.4 %) of the watershed has been developed. Federal agencies own 83,531 acres (2.0 %) of this developed land. Federal agencies have a substantial amount of undeveloped land (3,104,105 acres). In contrast to non-federal lands, very little of the undeveloped land owned by the federal government in the Bay watershed is agricultural (11,195 acres[7]). Figure 1 is a map that depicts the extent and location of federal developed and undeveloped lands within the Bay watershed.

[6] Personal Communication, Renee Thompson, Chesapeake Bay Program Office GIS Division
[7] Personal communication, Charles Wilson, DoD Chesapeake Bay Office and Cindy Tibbotts, Fish and Wildlife Service

Figure 1. Federal Developed and Undeveloped Lands



While the percentage of federal land in the Bay watershed may not seem that large, the federal government is the largest single landowner within the watershed. Strengthening storm water management at federal facilities and on federal lands should make a significant contribution to Bay restoration and demonstrate leadership. However, to achieve restoration state and local governments as well as private landowners will need to make similar improvements in their storm water management practices.

The contribution of storm water runoff to water quality degradation in the Bay was recognized long ago and each successive Bay agreement has placed more emphasis on storm water management. The *Chesapeake 2000* agreement[8] has many provisions that address management of storm water discharges from development and redevelopment projects, storm water discharges from developed lands, and runoff from undeveloped lands. Progress on these goals is reported annually to the Chesapeake Bay Program Office as part of the Bay progress reports that are submitted by federal agencies. Additionally, Chesapeake Executive Council Directive No. 01-1, *Managing Storm Water on State, Federal, and District-Owned Lands and Facilities,* was issued in 2001[9]. This directive has resulted in many projects that demonstrate innovative storm water management practices such as bioretention areas, permeable pavement, and rain barrels on federal facilities and lands. Executive Order 13508 will build on the established framework and progress of these preceding agreements and directives and will result in a more coordinated commitment to storm water management in the Bay watershed.

To determine the current state of federal policies and programs that address storm water management, a request for information was sent to all members of the Federal Office Directors (FOD) committee on 7 July 2009. The FOD committee includes representatives from the Department of Defense (Army, Navy, and Army Corps of Engineers), Department of Commerce (National Oceanic and Atmospheric Administration), Department of Homeland Security, Department of Interior (National Park Service, US Fish and Wildlife Service, and US Geological Survey), Department of Transportation (Federal Highway Administration), USDA (US Forest Service, Natural Resources Conservation Service), and the US Environmental Protection Agency. The request was also sent to the Air Force, the Marine Corps, the Defense Logistics Agency, and the General Services Administration. Each agency was asked to draft a short statement which describes its storm water policies and procedures. Specifically, the statement addresses whether or not the agency has any policies that require storm water management practices beyond what is required to comply with applicable local, state, and federal regulations. Agencies were asked to consider their storm water policy and procedures relative to new development and redevelopment projects, existing developed land, and undeveloped lands.

Although the responses indicate that most agencies do not have policies that require storm water management practices beyond what is required to comply with applicable regulations, many agencies have implemented innovative storm water management projects such as green roofs, permeable pavement, bioretention, shoreline or stream bank stabilization, and expansion of riparian buffers on some of their facilities. Department of the Navy and the National Park Service are two agencies that have policies which go beyond what is required to comply with regulations governing storm water. The Department of the Navy has a Low Impact

[8]Chesapeake Bay Agreement, Signed on 28 June 2000.
[9] Chesapeake Executive Council Directive 01-1, 3 Dec 2001

Development (LID) Policy which requires LID to be considered and implemented on new construction and major renovation projects with the goal of no net increase in storm water volume, sediment or nutrient loading. The National Park Service has a policy that addresses the protection of water quality, floodplains and wetlands and the management of watershed and stream processes to minimize human-caused disturbances such as storm water runoff and erosion. Several agencies have policies to encourage sustainable development and to obtain certification under the Leadership in Energy and Environmental Design (LEED) program. The LEED program contains the option to obtain credits for storm water management though it does not require the use of storm water management credits if enough credits are obtained in other facets of the program to meet the desired certification level.

In addition to assessing the storm water management policies of federal agencies in the watershed, the report team researched sources of existing information and guidance on storm water management. Since storm water discharges are significant contributors to water quality problems on a national level, there are several federal agencies and nationally recognized organizations that have been working to produce educational materials and guidance documents regarding storm water management practices. Rather than duplicate the efforts of these agencies and organizations, a list of pertinent websites from some of the key organizations involved in this effort is provided below.

- EPA Office of Water: http://cfpub2.epa.gov/npdes/home.cfm?program_id=6
- EPA Office of Wetlands, Oceans and Watersheds: http://www.epa.gov/owow/nps/categories.html
- Center for Watershed Protection: http://www.cwp.org/Resource_Library/index.htm
- Low Impact Development Center: http://www.lowimpactdevelopment.org/
- Chesapeake Stormwater Network: http://www.chesapeakestormwater.net/
- National Institute of Building Sciences: http://www.wbdg.org/references/mou_sw.php
- Federal Highway Administration: http://www.fhwa.dot.gov/environment/h2o_abs.htm
- International BMP Database: http://www.bmpdatabase.org/

Specific guidance from these agencies and organizations relating to the options to strengthen storm water management practices that could be used on federal facilities and lands will be referenced in the following section. EPA will be providing additional guidance on land management to fulfill their responsibility under Section 502 of this Executive Order. Federal agencies may also wish to consult state and local agencies for additional information on specific practices recommended within their jurisdictions.

III. Analysis

Federal agencies have a variety of facilities in the Bay watershed including highly industrial sites (such as naval shipyards); commercial sites (such as office buildings); highways; rural sites (such

as national wildlife refuges), park service and forest service lands; and even agricultural research facilities. A range of storm water regulatory programs apply to operations of these facilities including industrial and municipal storm water permits issued under the National Pollutant Discharge Elimination System (NPDES) program as well as some state nonpoint source pollution regulations.

When federal facilities develop or redevelop land, they are also subject to applicable state erosion and sediment control requirements and NPDES storm water construction permit requirements that address storm water runoff during construction and state storm water management requirements that require installation, operation, and maintenance of best management practices (BMPs) to permanently control storm water runoff from the development. These regulations vary from state to state and are continually evolving but generally require management of storm water resulting from one to three inches of rainfall per event to protect water quality. This is equivalent to 27,154 to 81,462 gallons per acre per event. These regulations also require peak discharge control to prevent downstream channel erosion and flooding from a design storm, commonly a 10-year storm which generally exceeds 5" of rainfall in the Bay watershed. This equates to a discharge volume of greater than 135,770 gallons per acre per event that must be managed.

Additionally, all federal agencies are subject to Section 438 of the Energy Independence and Security Act (EISA) which requires agencies to maintain or restore predevelopment hydrology with regard to temperature, rate, volume, and duration of flow for new development or redevelopment projects that exceed 5,000 square feet. Volumes that must be managed to comply with Section 438 of the EISA will vary depending on site conditions but are expected to be within the range of storm water management volumes that are required by states to protect water quality.

Potential impacts to the Chesapeake Bay from storm water released from federal lands are associated with three major source categories: storm water discharges from new development and redevelopment projects; storm water discharges from existing facilities and developed lands; and runoff from undeveloped lands. Several approaches for strengthening storm water management are discussed below for each category of wet weather pollutant loading. Some or all of the approaches within each category could be implemented depending on the level of resource commitment that the FLC wishes to make. Approaches that the FLC does not include in the Section 203 Strategy could still be utilized to address local water quality issues or comply with the Bay TMDL.

A. New Development/Redevelopment

Since federal agencies own considerable land in the watershed and may receive a significant amount of funding for new development and redevelopment under the Economic Stimulus Package and other initiatives, it is important to control runoff from new development and redevelopment on federal lands. To strengthen storm water management from new development and redevelopment, the following potential approaches could be pursued.

1. Low Impact Development Policy

The Navy has a Low Impact Development (LID) Policy which requires LID to be considered and implemented on new construction and major renovation projects with the goal of no net increase in storm water volume, sediment or nutrient loading. LID is a storm water management strategy concerned with maintaining or restoring the hydrologic functions of a site to achieve natural resources protection objectives through green infrastructure techniques. The policy, which is provided as attachment 1, applies to projects over a certain funding threshold and has a phased-in schedule, a waiver provision, and annual reporting requirements. The Army has also developed a draft LID Policy. The Navy and Army LID Policies could be used to develop a Federal Agency LID Policy that would be applicable to all federal agencies or all federal agencies could be required to adopt their own LID Policy using the military LID policies as a template.

2. EISA Section 438 Implementation Policy

Section 438 of the EISA requires agencies to maintain or restore predevelopment hydrology with regard to temperature, rate, volume, and duration of flow for new development or redevelopment projects that exceed 5,000 square feet. However, the law does not designate an agency responsible for ensuring compliance or require the development of implementing regulations. EPA could partner with federal agencies to revise storm water regulations under the Clean Water Act to achieve the intent of Section 438 of EISA. In the interim, federal agencies should adopt an EISA Section 438 Implementation Policy that would define the administrative and management controls needed to comply with EISA Section 438. The policy could include tracking documentation similar to that used by the Department of the Navy to track compliance with its LID Policy (see attachment 2). A template policy could be developed, with the option of federal agencies adopting their own policy that may deviate from the template.

3. Soil and Hydrology Investigations to Support Environmentally Sensitive Design

In order to implement environmentally sensitive design, federal agencies will need to have a good understanding of soils and hydrology. Therefore, an important option would be for federal agencies to perform studies to investigate and document soil types and hydrology on each property to enable site selection and site layout using environmentally sensitive design techniques.

4. Tree and Native Vegetation Preservation Policy

Since trees produce valuable storm water benefits, federal agencies should develop policies that, to the maximum extent practicable, select development sites that are not heavily forested; ensure that existing trees within the development footprint are

preserved; and mitigate for trees that must be removed. Federal agencies should also develop policies to mandate planting of additional trees when previously cleared lands are developed or when impervious areas are redeveloped to minimize the amount of runoff from the site. Federal agencies should also develop policies that attempt to minimize managed turf areas on development and redevelopment sites and maximize the use of native vegetation for landscaped areas of the site, thereby reducing the need for fertilizers and pesticides that could be released with storm water discharges.

5. Improvements to Predevelopment Hydrology for Redevelopment Projects

Another option would be for federal agencies to adopt a policy that requires ***improvements*** to the predevelopment hydrology for redevelopment projects at facilities in the Bay watershed, to the maximum extent technically feasible. While EISA 438 states that Federal agencies must "maintain or restore" the predevelopment hydrology of any "development or redevelopment" project, this option would emphasize restoring hydrology rather than just maintaining it, thereby truly demonstrating federal leadership within the watershed.

When it is not technically feasible to restore hydrology on a redevelopment site, federal agencies should look for opportunities to install storm water management practices off-site. If there is no available land for storm water practices on the property, agencies should be encouraged to obtain easements to site storm water management practices off the property but in the same watershed.

6. Guidance and Demonstrations of No Offsite Discharge of Storm Water

The EPA Bay Program Office is promoting a new program that challenges facilities to install and maintain a suite of storm water control measures to achieve no offsite discharges of storm water (the “No Runoff Challenge”). A final option would be to develop technical guidance that focuses on rainwater harvesting and reuse, in addition to infiltration practices, to achieve no offsite discharge of storm water for a particular design storm. The guidance could discuss demonstration projects such as the Science Museum of Virginia in Richmond, Virginia. The FLC could commit to implementing these projects on one or more federal facilities in the watershed to demonstrate feasibility using grants from the Fish and Wildlife foundation or federal agency resources. This option would truly demonstrate federal leadership as this is an emerging concept, but it would have the disadvantages of being potentially costly and difficult to implement since the concept is relatively new and will not be feasible on all sites. This option could also include a goal for how many projects to install (e.g., X projects per agency per year, or X projects by 201X) to require continued implementation.

B. Existing facilities and developed lands

To address storm water runoff from existing facilities and developed lands, the following potential approaches could be used.

1. Storm Water Regulatory Compliance Evaluations

One option for strengthening storm water management on existing facilities and developed lands would be to develop a program to ensure federal agencies are complying with all applicable federal and state storm water management requirements. Federal agencies could perform self-assessments of their storm water management programs at set intervals (e.g., every 1 to 3 years) and leave the details of the assessment to each agency or a checklist could be provided (perhaps from an existing source such as EPA's Office of Water or the VA/DoD Eagle Award Program.

2. Storm Water Compliance Training Program

Since federal facilities are routinely inspected by regulatory agencies, federal agencies should be required to develop a training program to assist in complying with storm water management requirements. This could include training of federal agency staff as well as training of contractors that are doing construction and maintenance work on federal facilities. The Departments of the Navy and Air Force and some other federal agencies use the Environmental Compliance Awareness, Training, and Tracking System (ECATTS) to train their personnel and contractors on a wide variety of environmental topics including storm water. Other agencies could use this product or a similar product to train their personnel and contractors.

Though many federal agencies have storm water compliance responsibilities, there are many federal facilities in the watershed not covered by storm water regulatory programs. Federal office complexes are generally not subject to storm water regulations governing their existing discharges. However, since they have impervious surfaces (i.e., rooftops, parking areas, and access roads), they contribute pollutants to the Bay through their discharges of urban storm water. To strengthen storm water management at these facilities, they should be assessed for opportunities to strengthen storm water management that go beyond current regulatory requirements. For federal office complexes managed by the General Services Administration (GSA), such assessments should be coordinated with the GSA. Additionally, there are many opportunities to improve storm water management practices at regulated facilities by implementing practices that exceed regulatory requirements. Therefore, the remaining options discuss evaluations and potential management practices to address storm water management measures that are not required by regulations.

3. Assessment and Implementation of Urban Storm Water Retrofit Practices

A third option would be to perform assessments of the feasibility of installing urban storm water retrofit practices that reduce runoff volume and improve storm water quality from existing development (paved parking areas, access roads, alleys, rooftops and other impervious surfaces) and managed turf areas. Federal agencies should be encouraged to seek opportunities to purchase off-site easements for the purpose of installing storm water retrofits if those agencies that have properties where it will be difficult to implement on-site retrofits or where off-site retrofits may be more beneficial to local water quality

Since urban storm water is the primary source of pollutants from most federal facilities, this would be a key option to implement. Agencies could utilize guidance on how to perform the retrofit assessments found in the Center for Watershed Protection Urban Storm Water Retrofit Practices Manual[10] and Chapter 10 of the EPA National Management Measures to Control Nonpoint Source Pollution from Urban Areas[11]. All federal agencies could be required to perform assessments at all of their facilities by a certain date and identify high priority areas for retrofit implementation. The FLC should require that agencies implement recommendations of the assessments as dictated by local water quality problems. The FLC should also establish a goal for how much developed land should be served by retrofits (e.g., X acres or Y % of an agency's developed land) by certain dates. Retrofit BMPs should be installed with the goal of restoring predevelopment hydrology to the extent that is technically and economically feasible.

4. Assessment and Implementation of Storm Water Management Retrofit Practices for Paved Roads

There is a substantial amount of impervious area associated with existing roads that were constructed on federal property before storm water management requirements were developed. Since runoff from paved roads has been shown to contain significant concentrations of a variety of pollutants, investigation of opportunities for installation of storm water retrofit BMPs to manage storm water from roads on federal land would be beneficial for the Bay. The FLC should require federal landholders to perform these investigations by a certain date and identify high priority areas for retrofit implementation. Retrofit projects should be designed to manage runoff to improve water quality and restore hydrology to the maximum extent technically feasible. Where it is not technically feasible to implement retrofits on federal property, agencies should seek opportunities to establish easements where retrofits could be constructed. The FLC should also provide goals such as management of runoff from X acres of roadway on Federal lands or Y% of the roadways that were constructed without storm water management practices.

[10] Urban Stormwater Retrofit Practices, Version 1.0, Center for Watershed Protection Manual 3, August 2007
[11] National Management Measures to Control Nonpoint Source Pollution from Urban Areas, EPA-841-B-05-004, USEPA, November 2005

The federal government does not own and maintain the interstate and U.S. highways; it only provides funding for their construction. The Federal Lands Highway Program (FLHP) administered by the Federal Highway Administration (FHWA) provides financial resources and technical assistance (including planning, design, construction and rehabilitation) for a coordinated program of public roads that service the transportation needs of Federal and Indian lands. Federal lands highways include highway and transit facilities such as park roads, parkways, and forest highways. Federal Lands Highways projects are selected by the Federal land management agencies. Water quality, storm water management and mitigating impacts are important design considerations of Federal Lands Highway Program projects. However, the FLC could encourage Federal Land Management agencies to consider innovative storm water improvement projects as they develop plans for use of funds under the Federal Lands Highway Program.[12]

5. Assessment and Implementation of Restoration Practices

Another option could be to perform studies to evaluate opportunities to restore and prevent further impacts to lands that have been impacted by storm water from development such as riparian buffers along urban streams; stream bank/shoreline stabilization; and other erosion control projects and stream restoration. This option could be limited to requiring that the assessments be performed or the FLC could also establish goals such as reestablishment of X feet or Y % of riparian buffers; repair of X square feet of erosion problems; and installation of X feet or Y % stream bank/shoreline stabilization and/or stream restoration by a certain year.

6. Assessment and Implementation of Non-Structural Storm Water Practices

Federal facilities could evaluate whether to implement non-structural storm water management practices such as:

- bans on the use of coal tar sealants to repair cracks in pavement;
- regular street sweeping programs;
- reduced mowing of highway medians;
- catch basin cleanout;
- ditch maintenance;
- reductions in herbicide use;
- bans or reductions on the use of fertilizers for turf management;
- development of nutrient management plans for golf courses;
- development of reforestation plans for previously cleared areas, particularly managed turf areas;
- designation of no mow zones; and
- urban tree preservation and replacement policies.

[12] Personal Communication with Dennis Durbin and Camille Mittelholz, Federal Highway Administration

The FLC should require that these practices be evaluated and also establish goals such as sweeping of X % of impervious surface, reduced mowing on X acres, maintenance of X% or Y miles of ditches per year, development of fertilizer management plans for all (or certain types of) facilities by a certain date (all golf courses should develop nutrient management plans), development of reforestation plans for certain types of facilities, reforestation of X acres or Y% of previously cleared forestland and managed turf, designation of X acres of no mow zones, and/or development of tree preservation and replacement policies at X% of facilities by a certain date.

C. Undeveloped Lands

Many federal agencies own large tracts of undeveloped land. Although pollutant loading from undeveloped lands is not as high on a per acre basis as loading from developed lands, there are storm water management practices that can be employed to reduce pollutant loading from these lands.

1. Assessment and Implementation of Storm Water Practices for Unpaved Roads

Federal agencies own large tracts of undeveloped land that have substantial networks of unpaved roads. Guidance on management of erosion from unpaved roads may be found at: http://www.epa.gov/agriculture/trur.html. The U.S. Army Corps of Engineers has found that as much as 75 percent of soil loss on some installations can be attributed to unpaved roads, trails, and their associated drainage ditches[13]. Since unpaved roads are a potential source and pathway of sediments if they are not properly constructed or maintained, agencies should be required to assess their unpaved roads for erosion problems and institute practices necessary to prevent and control erosion. The FLC should allow implementation as necessary to address local water quality issues and it should establish goals for implementation of control measures such as maintenance of X miles or Y % or unpaved roads by a certain date.

2. Storm Water Management Practices for Forested Lands

Since the federal government owns large tracts of managed forest land in the Bay watershed, there is a substantial potential for sediment and nutrient loading from these lands, particularly when timber is harvested. Therefore, soil conservation plans or other BMPs for forest management operations should be required on these lands. Additionally, federal agencies should commit to preserving existing forested lands as a way to prevent additional pollutant loading associated with development of forested land. Agencies could also explore their authorities to use conservation easements on

[13] Personal communication with Hal Balbach, Army Corps of Engineers, Engineer Research and Development Center/Construction Engineering Research Laboratory

off-site forested lands to prevent development and associated storm water pollutant loading.

3. Storm Water Management Practices for Agricultural Lands.

Although federal agencies do not manage much agricultural land, since agricultural practices have the potential to contribute nutrient and sediment loading, nutrient management plans and soil conservation plans should be required on all federal land that is used for agriculture (whether agricultural operations are performed by the federal agency or a lessee). Agencies and their lessees should maintain stream buffers to filter agricultural runoff before it reaches waterways.

IV. Recommendations

Although we urge the FLC to consider the full range of options that were analyzed in Section III, the key options that were presented are highlighted to strengthen storm water management practices at federal facilities from new development and redevelopment, existing developed lands, and undeveloped lands.

1. Adopt agency-specific policies that would define the administrative and management controls needed to comply with the storm water requirements for new development and redevelopment projects in Section 438 of the Energy Independence and Security Act.

2. Investigate and document soil types and hydrology on federal properties to enable site selection and site layout using environmentally sensitive design techniques to facilitate the use of storm water management practices that maintain or restore natural hydrology.

3. Investigate opportunities for installing innovative storm water management retrofits at existing facilities and on existing lands and implement them where feasible and necessary to meet local water quality goals or based on goals set by the FLC.

4. Investigate opportunities for installation of storm water retrofit BMPs to manage storm water from existing paved roads on federal land and implement them where feasible and necessary to meet local water quality goals or based on goals set by the FLC.

5. Institute practices to prevent and control erosion from unpaved roads to prevent soil loss into nearby receiving streams.

6. Explore authorities for use and expansion of land conservation easement programs, particularly those that preserve forest land and those that would be used to install storm water management practices.

Additionally, we are providing a general recommendation that will improve information on the extent of federal land ownership and land use in the Bay watershed.

7. Improve GIS Data on Federal Land Ownership and Land Use. The Bay program office has a wealth of data on federal land ownership. However, some of the data are incomplete as there are federal parcels for which the specific agency is not identified. There also appears to be agency specific real estate data which does not appear in the publicly available data sources. Therefore, we recommend that federal agencies be required to report all of their real estate holdings and provide associated GIS data to the Bay Program Office by December 31, 2009. Additionally, we recommend that federal agencies provide the Bay Program Office with updates to publicly available land use data on federal lands that can be incorporated into the Bay loading model to accurately determine existing pollutant loads from each federal facility. This data will allow more effective management of federal lands within the context of the Bay program and aid in implementation of the Bay TMDL.

V. Elements of the Federal Coordinated Strategy

A. Environmental Goals and Milestones

The goal for strengthening storm water management practices on federal facilities and lands is to reduce pollutant loadings associated with development and redevelopment, existing facilities and developed lands, and from undeveloped lands under federal ownership. Since much of the pollutant loading to the Bay is from storm water discharges from urban and suburban areas and runoff from undeveloped lands, the successful achievement of this goal will contribute towards protection and restoration of the Bay.

Goals and milestones associated with the key recommendations discussed in section IV of this report are provided below.

- EISA Section 438 Implementation Policy – Develop by end of FY 2010
- Soil and Hydrology Investigations to Support Environmentally Sensitive Design – X % of facilities by a certain date and all facilities by another date
- Urban Storm Water Retrofit Program - X acres or Y % of an agency's developed land by certain dates
- Paved Road Runoff Retrofit Program - X acres or Y % of an agency's paved roads by certain dates
- Unpaved Road Erosion Prevention and Repair Program - Maintenance of X miles or Y % or unpaved roads by certain dates

- Federal Geospatial Real Estate and Land Use Data – Submit Real Estate data to CBPO by December 31, 2009 and Land Use data to CBPO by March 31, 2010

B. Programs and Strategies

- EISA Section 438 Implementation Policy
- Soil and Hydrology Investigations to Support Environmentally Sensitive Design
- Urban Storm Water Retrofit Program
- Paved Road Runoff Retrofit Program
- Unpaved Road Erosion Prevention and Repair Program
- Land Conservation Easement Program Expansion
- Geospatial Data Inventory Improvement Program

C. Coordinated and Effective Mechanisms

Section 202a (Water Quality) has a storm water component. Recommendations and programs discussed in this report should be coordinated with recommendations and programs from the storm water section of the 202a report.

Section 202b addresses targeting resources. There are grant programs that can be used for storm water management practices such as Non Point Source pollution control grants administered by EPA under Section 319 of the Clean Water Act and Federal Aid Highway Program grants administered by the FHA for storm water improvements on highways on state and local lands.

Both Section 202e (Land Conservation and Public Access) and 202g (Habitat and Research Activities) have land conservation components. Recommendations in this report to expand the use of conservation easements to preserve forest lands and install storm water management practices should be coordinated with the 202e and g reports which focus on protection of the Bay's significant landscapes that have ecological and historical value.

Federal reporting requirements for each of the recommendations ultimately approved by the FLC will have to be developed to assess progress on implementation in the annual progress report required by the executive order. Information from these reports will have to be included in existing Bay program reporting requirements such as the Annual Bay Report data call and Chesapeake Action Plan Database which are reported to the Chesapeake Bay Program Partnership via the Chesapeake Bay Program Office. Therefore, the progress reports developed to demonstrate implementation of the executive order should be structured to be consistent with the data elements in these existing Bay Program reports.

Reports on implementation of storm water management practices on federal lands should also be used to assess progress with the biennial milestones being established for the Bay. Some states have included federal facilities in their milestones and others have not. The 203 strategy could either recommend that separate biennial milestones be established for federal facilities similar to what the states have created that could be independently tracked and reported or federal implementation of storm water practices should be reported to the states for inclusion in the state milestones.

D. Adaptive Management Principles

Under the Bay Program, the six states and the District of Columbia will review their progress in meeting the two year milestones. Clean Water Act Sections 303(d) and 305(b) and their implementing regulations require states to prepare biannual Integrated Reports that assess whether water quality standards are being attained in the Bay and its tributaries. Federal agencies should evaluate their progress in implementing the recommendations as part of the annual progress report required by this executive order. Based on these reports, the FLC can accelerate implementation of the recommendations if progress is not acceptable.

VI. Conclusion

This report provides a wide range of options for strengthening storm water management practices from new construction projects, existing developed lands, and undeveloped lands owned by the federal government in the Chesapeake Bay Watershed. The report provides some key recommendations and some potential metrics for measuring progress but urges the Federal Leadership Committee to determine the ultimate suite of recommendations and metrics so that resource needs can be projected, planned, and budgeted.

Attachment 1

DEPARTMENT OF THE NAVY
THE ASSISTANT SECRETARY OF THE NAVY
(INSTALLATIONS AND ENVIRONMENT)
1000 NAVY PENTAGON
WASHINGTON, D.C. 20350-1000

NOV 16 2007

MEMORANDUM FOR DEPUTY CHIEF OF NAVAL OPERATIONS
(FLEET READINESS AND LOGISTICS)
DEPUTY COMMANDANT OF THE MARINE CORPS
(INSTALLATIONS AND LOGISTICS)

SUBJECT: Department of the Navy Low Impact Development (LID) Policy for Storm Water Management

References: (a) 33 United States Code 1251 (Clean Water Act)
(b) Title 40 Code of Federal Regulations 122, 130
(c) Department of Defense Unified Facilities Criteria 3-210-10 Design for Low Impact Development, October 2004
(d) Executive Order 13423 "Strengthening Federal Environmental, Energy, and Transportation Management", January 2007
(e) OPNAVINST 5090.1C, Clean Water Ashore Requirement, October 2007
(f) MCO P5090.2A, Water Quality Management, July 1998

BRAC 05 implementation, Department of Defense (DoD) Grow the Force Initiatives, and ongoing installation sustainment and modernization, have resulted in significant construction activity on Department of the Navy (DON) installations. New construction results in loss of natural vegetation cover and drainage capacity and increased storm water runoff. Conventional storm water collection and conveyance systems and storm water treatment options do not and can not replicate natural systems, thus increasing the volume and flow of storm water as well as sediment and nutrient loadings to streams, wetlands, and other receiving water bodies. Because of continuing water quality problems, States and the US Environmental Protection Agency are considering mandatory treatment and control of storm water. Conversely, low impact development (LID) techniques offer a suite of Best Management Practices that maintain or restore predevelopment hydrology. It mitigates the adverse effects of construction projects on water quality by cost effectively reducing the volume and pollutant loading of storm water before it reaches the receiving water bodies. LID utilizes strategies that infiltrate, filter, store, evaporate, and/or retain runoff close to its source. LID further reduces installation reliance on aging storm water management infrastructure. References (a) thru (f) provide requirements and guidance for LID.

This DON policy sets a goal of no net increase in storm water volume and sediment or nutrient loading from major renovation and construction projects[1]. In order to support this goal, as well as reduce reliance on conventional storm water collection systems and treatment options, this policy directs that LID be considered in the design for all projects that have a storm water management element. LID will be implemented where possible to assist DON installations in complying with references (a) and (b), as well as all applicable State and Federal requirements for sustainable development. In those infrequent situations where LID is not appropriate given the characteristics of the site, the Navy and Marine Corps are authorized to establish a waiver process that, if used, would include regional engineer level review and approval.

The Navy and Marine Corps are directed to immediately plan, program, and budget to meet the requirements of this policy starting in FY 2011. All efforts shall be made to incorporate LID practices in the fiscal years 08, 09, and 2010. The services are further directed to submit to my office an annual report that summarizes all projects that have a storm water component and identify how LID was implemented or waived. If waived, the report must identify the approving official. Naval Facilities Engineering Command, as the Department's expert in acquisition, construction, and environmental management, shall assist Navy and Marine Corps installations in meeting these policies. My point of contact for this matter is CAPT Robin Brake, robin.brake@navy.mil, (703) 693-2931.

BJ Penn

[1] Major renovation projects are defined as having a storm water component and exceeding $5 million when initially approved by DASN (I&F). Major construction projects are defined as those exceeding $750K.

Attachment 2

DEPARTMENT OF THE NAVY
OFFICE OF THE ASSISTANT SECRETARY
(INSTALLATIONS AND ENVIRONMENT)
1000 NAVY PENTAGON
WASHINGTON, D.C. 20350-1000

April 2, 2008

MEMORANDUM FOR DIRECTOR ASHORE READINESS DIVISION (N46)
DIRECTOR, ENVIRONMENTAL READINESS DIVISION (N45)
DEPUTY ASSISTANT DEPUTY COMMANDANT OF THE
MARINE CORPS INSTALLATIONS AND FACILITIES

SUBJECT: Department of the Navy Low Impact Development (LID) Implementation for Storm Water Management

Reference: ASN I&E Memo of Nov 16, 2007 "Department of the Navy LID Policy for Storm water Management"

The reference establishes a LID Policy for Storm Water Management at all Navy and Marine Corps installations. The policy stipulates that LID be considered in the design phase for all projects with a storm water management element. NAVFAC HQ is responsible for ensuring that all Navy and Marine Corps installations meet this policy.

The purpose of this memorandum is to seek information on progress in implementing the policy and to request a timeline for implementation. Specifically, how will LID information for relevant projects be tracked and how will projects be evaluated to decide whether LID is appropriate? What criteria will be used to allow for waiver of those projects? Have uniform design specifications and contract language been developed? Is language being incorporated into contracts for FY09 and out projects? What metrics have been developed for long term use and evaluation? Finally, what provisions are being made to incorporate LID practices in FY08 and FY09 projects and to incorporate design requirements into projects going into the FY10 budget? Please provide responses to these questions to my office by April 18, 2008.

The LID policy requires an annual report to ASN I&E summarizing all projects with a storm water component and identifying how LID was implemented or waived. Please submit this report to ASN (I & E) by November 15th for the preceding fiscal year. The report should include a listing of projects meeting the policy criteria for consideration along with their location and a brief description of the project, a description of any LID practices incorporated, cost of the LID practices and, if LID was waived, an explanation of how the decision was reached and who reviewed and approved the waiver.

My point of contact for this matter is CAPT Robin Brake, at robin.brake@navy.mil, or (703) 614-0268.

Donald R. Schregardus
Deputy Assistant Secretary of the Navy
(Environment)