



## Executive Director's Recommendation

Commission Meeting: October 4, 2012

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**PROJECT**

**Federal Environment Element of the Comprehensive Plan for the National Capital**  
Washington, D.C.

**NCPC FILE NUMBER**

CP01b

**NCPC MAP FILE NUMBER**

N/A

**SUBMITTED BY**

Staff of the National Capital Planning Commission

**APPLICANT'S REQUEST**

Final adoption of the updated policies to the Federal Environment Element, to take effect when all of the Federal Elements of the Comprehensive Plan for the National Capital have been adopted.

**REVIEW AUTHORITY**

Preparation and Adoption of Federal Elements of the Comprehensive Plan pursuant to 40 U.S.C. § 8721

**PROPOSED ACTION**

Approve as requested

**ACTION ITEM TYPE**

Staff Presentation

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### PROJECT SUMMARY

At its June 7th, 2012 meeting the Commission approved for public release draft policy updates to the Federal Environment Element of the Comprehensive Plan for the National Capital. A 60-day public comment period was conducted and staff has been working to respond to the comments that were received as well as drafting a narrative to accompany the new policies. At this time, the policies in the Environment Element are being presented for final adoption by the Commission. To avoid confusion among the public and applicant agencies as well as to provide a streamlined process for updating the Comprehensive Plan, staff is recommending approval of the Federal Environment Element policies, however, the policies will not take effect until all the Federal Elements have been updated and are ready for publishing.

The Federal Elements of the Comprehensive Plan were last updated in 2004 when the National Capital Planning Commission adopted a complete revision of the Plan and its policies. Since that time, the federal government has increased its focus on environmental impacts and the overall sustainability of its buildings and operations through legislation, executive orders and new policies. There has also been an update by the District of Columbia government to the District Elements of the Comprehensive Plan, including its environmental policies. The aim of this update to the Federal Elements is to audit the existing policies to ensure they are supportive of the federal government's goals regarding sustainability, environmental issues, and regional coordination in the National Capital Region. Also, the updates are intended to reflect current best practices in environmental planning. The update looks to ensure that federal planning and

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development efforts are integrated with the goals of the recently adopted District Elements of the Comprehensive Plan, the Metropolitan Washington Council of Government's Report on Climate Change, and with other federal, regional and local government initiatives.

## KEY INFORMATION

- In addition to auditing existing policies, three new policy areas are being introduced for the Environment Element. They are: Climate Change, Light Pollution, and Energy Conservation.
- The draft update to this element has been vetted through internal staff review and in discussions with federal and local government stakeholders through a working group meeting in February 2012 and the receipt of comments from agency stakeholders in March 2012. The Council on Environmental Quality staff also provided input to the draft revisions.
- There has been an update by the District of Columbia government to the District Elements of the Comprehensive Plan. At its January, 2011 meeting, the Commission concluded that the proposed updates to the District Elements would have no negative impact to the Federal interest. This update to the Federal Environment Element is to ensure that the policies are supportive of the most current federal government goals regarding environment impact and sustainability and that they are compatible with the District Elements of the Comprehensive Plan and with current agency initiatives.
- After the Commission authorized the release of the draft policy updates, Staff opened a 60-day public comment period running from June 11, 2012 to Friday, August 10, 2012. A public event was also held on June 27, 2012 where the draft policies were presented with an opportunity for the public to provide comments.

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## RECOMMENDATION

Commission action requested:

- **Final adoption** of the updated policies to the Federal Environment Element
- **Hold the policies in abeyance** until all of the Federal Elements of the Comprehensive Plan for the National Capital have been adopted at which time the policies will go into effect (pursuant to 40 U.S.C. § 8721)

## PROJECT REVIEW TIMELINE

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| Previous actions | February 5, 1981 – The Commission adopted the Federal Environment Element of the Comprehensive Plan for the National |
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|   | <p>Capital.</p> <p><b>May 4, 2001</b> – The Commission adopted a revised Federal Environment Element of the Comprehensive Plan for the National Capital.</p> <p><b>August 5, 2004</b> – The Commission adopted the updated Comprehensive Plan for the National Capital, which included the current Federal Environment Element.</p> |
| <p><b>Remaining actions</b><br/>(anticipated)</p> | <p>NCPC staff will present to the Commission all of the Federal Elements of the Comprehensive Plan for the National Capital once the update process is complete and prior to the Plan's publishing.</p>   |

Prepared by D. Zaidain  
September 17, 2012

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### I. PROJECT DESCRIPTION

#### **Background**

The National Capital Planning Act of 1952 recognizes the Commission’s interest in the region’s environment by giving the Commission the responsibility “to preserve the important...natural features of the national capital.” The updated Federal Element policies will help manage the federal government’s environmental impacts in the National Capital Region (NCR) and enable agencies to meet mission needs while fulfilling the goals of new federal environmental laws and related Executive Orders. The policies work hand in hand with other Federal Elements in the Comprehensive Plan to establish priorities for future federal investment and coordination with local and regional environmental initiatives. These priorities include working with host communities to facilitate climate change adaptation planning, reducing greenhouse gas emissions through alternative means of transportation such as bicycles, use of alternative fuels, and continued and enhanced use of mass transit. Others actions include developing policies regarding environmental mitigation for federal facilities that provide better environmental controls and encouraging agencies to mitigate adverse impacts to soils, air quality, water supply issues, vegetation, floodplains, and wetlands.

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## **Proposal**

The policies in the Federal Environment Element relate to the maintenance, protection, and enhancement of the region's environment. The Element provides an overall framework within which the Commission and others can evaluate the environmental implications of federal projects and facilitate coordinated management of environmental resources among agencies. The Element also serves to convey the Commission's environmental policies to other federal agencies, to local governments and coordinating bodies such as the Metropolitan Washington Council of Governments (MWCOCG) and to citizens and advocacy groups.

The policies contained in this Federal Environment Element are designed to reinforce the federal government's continued and emerging priorities for sustainable development and potential impacts to the environment resulting from federal actions. The draft narrative and policies are attached as an Appendix.

## **II. PROJECT ANALYSIS/CONFORMANCE**

### **Executive Summary**

The federal government takes a strong interest in protecting the region's environment and has a significant influence on it for a variety of reasons:

- The federal government owns a large portion of the region's land and water area, including many key environmental resources.
- The federal government is also the region's single largest employer, tenant, and building owner. As a result, the government's environmental stewardship has a significant impact on the region's overall environmental quality.
- As a permanent presence in the region, the federal government can maintain a long-term perspective on the region's environmental quality.
- The nation and world look to the Washington region as a symbol and model for effective governance. Environmental policy in the National Capital Region, therefore, has a significant impact far beyond the immediate environment of the region.
- The region is interconnected to environmental resources beyond its borders. As a result, environmental policies within the region affect populations and ecosystems beyond those of the region itself.
- As home to the government agencies that set policies for the nation, the region often plays a role in testing innovative policies and demonstrating the benefits of sound environmental stewardship.

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## **Analysis**

The key changes to the Federal Environment Element include the introduction of three new policy areas. These policy areas are Climate Change, Light Pollution, and Energy Conservation and are discussed further below.

### *Climate Change*

In March 2011, the Council on Environmental Quality (CEQ) issued a set of implementing instructions for Federal Agency Adaptation Planning. The instructions informed agencies on how to integrate climate change adaptation into their planning, operations, policies, and programs. CEQ also advised federal agencies that they should consider opportunities to reduce Greenhouse Gas (GHG) emissions caused by federal actions and adapt their actions to climate change impacts throughout the National Environmental Policy Act (NEPA) process. By statutes, Executive Orders, and agency policies, the federal government is committed to the goals of energy conservation, reducing energy use, eliminating or reducing GHG emissions, and to off-set climate change.

The scientific community has also identified a broader approach to understanding the potential effects of climate change. In January 2009, the U.S. Climate Change Science Program (CCSP) transmitted to the President and the Congress a report titled: *Coastal Sensitivity to Sea-Level Rise: A Focus on the Mid-Atlantic Region*. The report extensively documents climate change effects relative to sea-level rise as a major occurrence to be considered by the mid-Atlantic region, including Washington, DC.

Recent U.S. and international assessments of climate change show that global average sea level rose approximately 1.7 millimeters per year through the twentieth century, after a period of little change during the previous two thousand years. Observations suggest that the rate of global sea level rise may be accelerating. Vulnerability to threats associated with rising sea levels is compounded by high population densities along coastal areas and rivers leading to major estuaries, such as the Chesapeake Bay, and the possibility of other effects from susceptibility to storms and environmental stressors. Other potential impacts of climate change are higher air and water temperatures, and changes in precipitation patterns.

The likelihood of rising sea levels is high, with 2095 projections ranging from a low of 38 centimeters (15 inches) to a high of 102 centimeters (40 inches). A 2008 report from the Chesapeake Bay Program estimates a sea level increase within the Bay of approximately 70–160 centimeters (27.5–62.9 inches) by 2100. Areas with potential for significant effects include areas in Washington, D.C., lying along the shores of the Potomac River. The probable rise of even a few feet would exacerbate the effects of tides or floods in those areas.

The updated to the Federal Environment Element reflects the assertion that climate change will be felt across an array of sectors. The predicted rise in the frequency and intensity of heat waves will increase the rates of heat-related deaths and respiratory problems in the region. Increases in the region's temperature will also create more heat islands and higher ground-level ozone

pockets, which can exacerbate asthma and respiratory problems. More code orange and red days are expected with increased smog, ozone, and particulate matter levels. Climate change could also result in an increase in the intensity and frequency of storms would increase the potential for deaths due to flooding and wind damage.

The full scope of the impact of climate change on the Washington region has yet to be fully analyzed. Risks and financial effects are critical to any set of decisions that will require an investment of substantial resources that could address climate effects. Maryland has been active in developing adaptation priorities and opportunities, but so far has focused mainly on vulnerable coastal areas. Virginia has also begun to assess the potential damage climate change could have on its coastal areas, agriculture, and recreational resources. The District of Columbia is reviewing impacts related to heat-island issues, vegetation, energy and building environmental effects, and stormwater management. The District is committed to reducing its 2006 levels of greenhouse gas emissions 20 percent by 2012, 30 percent by 2020, and 80 percent by 2050. Despite having higher emissions than some comparison cities, the District's dense urban development, availability of mass transit, and walkable neighborhoods will facilitate its efforts to reduce greenhouse gas emissions. The District's Climate Action Plan is focused on comprehensively mitigating the impacts of climate change. There is a clear need for cooperation on a regional level to help shape policy, address impacts, formulate adaptation strategies, and analyze options for mitigating climate change. The federal government must play a role in this effort by accounting for climate change in its initiatives.

The policy section of the Environment Element supports the recommendations of the 2010 and 2011 Progress Reports of the federal Interagency Climate Change Adaptation Task Force. The reports recommend that agencies integrate adaptation planning to ensure that federal operations and programs remain effective in a changing climate. Implementing instructions for this work were issued by the Council on Environmental Quality. Agencies in the National Capital Region are now evaluating how climate variability and change will impact their operations and services, and are beginning to integrate adaptation into their planning processes. The Element reflects (1) newly established federal adaptation policies; (2) increased sharing of climate adaptation expertise and information across agencies; and (3) ongoing development of needed adaptation plans.

### *Light Pollution*

Light pollution first became a concern in the 1970s when astronomers identified the increase in lighting associated with development and growth as a contributing factor in the degradation of the night sky. More recent studies suggest that navigational lighting and building lighting posing a continuing threat to migrating birds and other wildlife. In response to these issues, a national and international "dark sky" movement has begun to advocate for changes in lighting design. While light emissions in the early part of the 20th century would have been considered minor problems in relation to particulate matter, today the situation is often reversed—with particulate matter levels improving while night sky darkness decreases—leading to light trespass, dangerous glare, and wasted energy. Significant degradation has already occurred in the National Capital Region.

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As noted by the latest U.S. EPA report on nighttime lighting: *Reducing Artificial Nighttime Light Pollution and Its Impacts, August 27, 2010*; “Artificial nighttime lighting is not a bad thing per se. In the right amount it provides comfort, visibility, safety, and security. But too much of it can cause problems. Excessive, misplaced light is an unnecessary waste of light and energy. Though much more research is needed, we know that the consequences of light pollution are far-ranging. Fortunately, it is relatively easy to tackle without needing to make significant trade-offs, simply by eliminating upward and horizontal spillage and turning off unnecessary lighting. Light is easier to clean up than air or water pollution, and the results are immediate. Such actions will also reduce energy consumption and the emissions of greenhouse gases and pollutants produced from generation of that energy.”

The proposed Federal Environment policies reflect a balanced approach to the use of exterior lighting. The policies support lighting use but lighting should be carefully designed and controlled to maximize benefits while minimizing negative impacts. Lighting provides aesthetic benefits, such as highlighting our government’s symbolic buildings and memorials for nighttime viewing. It also is used to enhance safety and security, but similar benefits can sometimes be obtained with motion-sensitive lighting fixtures, or with lower lighting levels that avoid sharp contrasts and glare.

#### *Energy Conservation*

Federal government agencies of the NCR have developed many tools, resources, programs, and other forms of technical assistance to support federal and private sector energy conservation and sustainability efforts, too numerous to list in this document. From ENERGY STAR © to WasteWise© for example, the U.S. EPA continues to develop and make available information that agencies can use to collect and benchmark resources and energy use. ENERGY STAR©’s Portfolio Manager, for example, assists agencies to understand and benchmark energy use as a first step in reducing energy intensity. EPA’s Laboratories for the 21st Century program provides a similar tool for laboratories, which EPA, the Department of Energy, and the National Institutes of Health have used. Improving the energy efficiency of federal facilities is one of the most constructive, cost-effective ways to address the challenges of high energy prices, energy security and independence, air pollution, and global climate change. The policies provide a basis for federal agencies to begin to conserve energy in their day to day activities.

Staff believes the three new policy areas are significantly relevant to improvement and continual maintenance of the federal establishment and interests in the National Capital Region. Furthermore, the proposed revisions address new issues and challenges in the areas of preserving, protecting, and enhancing the federal environment. The Element acknowledges both existing and new laws aimed at protecting the environment and recognizes the Commission's responsibilities to ensure that federal agencies follow the spirit and procedures embodied in these laws as they conduct their activities. They highlight the role that the federal government has as a steward for the environment both nationally and in the Washington area.

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It is staff's recommendation to the Commission adopt the updated policies for the Environment Element as final, but note that they will not take effect until all of the Federal Elements have been adopted.

*Public Comments*

Below is a list of public comments received during the 60-day public comment period along with staff responses.

**Comments submitted by Susan Herre  
Received: July 16, 2012**

Comments with Responses in italics:

I spoke about waste-to-energy at the NCPC Public Forum: Comprehending the Comp Plan - Environment Element on June 27, 2012. The company that is advancing waste-to-energy is Pyromex <http://www.pyromex.com/>. The U.S. contact is Thomas Joyce [thomas.joyce@pyromex.com](mailto:thomas.joyce@pyromex.com).

*Staff appreciates the information and will keep the comment on file.*

**Comments submitted by Michael Echavarria  
Received: July 9, 2012**

Please consider a policy that requires weight slips and associated reports to be provided only by Material Recycling Facilities that are ICSR certified as legitimate recyclers.

*NCPC does not regulate or have authority over recycling or solid waste facilities.*

**Comment submitted by JW Spear, Sr., P. E.  
Received: June 27, 2012**

Please consider incorporating a policy that would require all Construction and Demolition (C&D) debris recycling to be performed by facilities whose diversion and recycling statistics are certified by an agency employing an ISO compliant, third-party Certification Program. Currently, stakeholders in C&D recycling projects have no real ability to confirm the validity and accuracy of a C&D recycling facility's statistics. This step will assure reliable statistics reporting.

*NCPC does not regulate or have authority over recycling or solid waste facilities.*

**Comments submitted by Joseph Abrahams  
Received: June 27, 2012**

Please consider adding policy to require that only ICSR certified construction and demolition recycling facilities may provide recycling and landfill diversion reports.

*NCPC does not regulate or have authority over recycling or solid waste facilities.*

**Comprehensive Plan for the National Capital**

This update to the Federal Environment Element of the Comprehensive Plan is provided in accordance with the provisions of the preparation and adoption of Federal Elements of the Comprehensive Plan specified at 40 U.S.C. § 8721.

**National Environmental Policy Act (NEPA)**

Staff reviewed the proposal in accordance with NCPC's Environmental and Historic Preservation Policies and Procedures, and determined that the proposed federal element update can be categorically excluded from further environmental analysis and documentation. The action is determined by the staff to qualify as categorical exclusion as cited at the Commission's procedure (11) "Adopt a Federal Element of the Comprehensive Plan or amendment thereto, 40 U.S.C. 8721(a): D.C. Code 2-1003."

**National Historic Preservation Act (NHPA)**

This proposal does not sustain characteristics as a federal undertaking. The proposal of policy revision does not implement, contract, or take other actions that would preclude consideration of the full range of alternatives to avoid or minimize harm to federal historic properties. Consequently, the proposed action does not require review pursuant to the NHPA, Section 106 process.

**III. CONSULTATION**

**Coordination with federal and local agencies**

The updates to the Federal Environment Elements have been coordinated with external stakeholder agencies through a stakeholder forum held on February 15, 2012. A stakeholder comment period was opened from June 11, 2012 through August 10, 2012 to allow stakeholder agencies and the general public to review the draft policy update and submit comments.

**IV. APPENDIX**

Copy of the Final Federal Environment Element Narrative and Policies.

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## FEDERAL ENVIRONMENT ELEMENT

### The Federal Environment Element

Goal: The federal government will promote the National Capital Region as a leader in environmental stewardship and sustainability. Preserving and enhancing the quality of the region's natural resources benefits the local community and provides a model for the nation.

#### Introduction

The Federal Environment Element identifies the National Capital Planning Commission's planning policies related to the maintenance, protection, and enhancement of the region's environment. This includes its natural attributes and habitats as well as its built environment. The element provides an overall framework from which the Commission and others can evaluate the environmental implications of federal projects, encourage improved environmental design and development practices, and facilitate coordinated management of environmental resources among agencies.

The National Capital Region's natural resources have influenced its development throughout its history, from its agricultural beginnings and early port cities to the siting of the capital city at the confluence of two rivers. The region's topography, forests, and waterways give the nation's capital a unique environmental setting that has been respected and protected for generations. Today, even as these environmental resources continue to be valued, the National Capital Region has grown to become one of the nation's largest metropolitan, in terms of population, jobs, and annual visitors. This growth requires conscious management and stewardship to maintain a balance with the region's natural environment.

The federal government has a significant influence and strong interest in protecting the region's environment, for a variety of reasons:

- The federal government owns key environmental resources, including a large portion of the region's land, as well as much of its water area..
- The federal government is the region's single largest employer, tenant, and building owner.
- The federal government maintains a long-term perspective on the region's environmental quality as a permanent presence in the region.
- The nation and world look to the National Capital Region as a symbol and model of leadership. Environmental policy in this region, therefore, has an impact far beyond the immediate environment of the region.
- The region is interconnected to environmental resources beyond its borders. As a result, environmental policies within the region affect populations and ecosystems beyond those of the region itself.

- As home to the government agencies that set policies for the nation, the region often plays a role in testing innovative policies and demonstrating the benefits of sound environmental stewardship.

The National Capital Region has a complex economy that is fueled by millions of residents and visitors that work for or interact with federally related functions. As in any metropolitan area, it is a challenge to accommodate offices, housing, transportation, and other development with minimal disruption to the natural environment. To address potential environmental impacts, the federal government supports policies that direct development and encourage greater density in established areas and near transit. Sound planning recognizes the value of compact, efficient, and well-designed development as a necessary part of the protection and enhancement of existing natural resources.

When preparing development proposals such as site selection for agency relocation, federal agencies should consult with NCPC early and often to ensure that environmental issues are identified and considered. Federal agencies should also work in cooperation with representatives from state and local governments and adjacent communities in applying the policies of this element. Other Federal Elements offer related guidance.

The following sections outline the major features of the region's environment and state the Commission's policies.

#### Legislative and Regulatory Framework

The federal government has created innovative solutions to environmental problems in many ways. In response to better data and well publicized environmental justice issues, federal, state and local governments have developed programs to improve environmental quality. Several Presidential executive orders and local initiatives encourage federal and local governments to work together and assume leadership roles in improving the environment. A number of environmental laws define the federal government's responsibility for protecting and conserving environmental resources. The U.S. Environmental Protection Agency (EPA) develops and enforces regulations that implement many of these environmental laws. EPA is also responsible for setting national standards for a variety of environmental programs.

Federal agencies must comply with environmental laws, which cut across nearly all federal programs. The primary environmental law applied to all federal activities is the *National Environmental Policy Act of 1969* (NEPA), which requires federal agencies to evaluate the effect of their actions on the quality of the environment. Federal agencies must document these impacts as part of their decision-making process. NCPC reviews environmental documentation as part of the submission review process. The Council on Environmental Quality's (CEQ) regulations further define aspects of environmental implementation and compliance. Together, NEPA and CEQ requirements help the Commission and submitting agencies assess and properly address environmental impacts early in the master planning and project planning processes. Additional laws cover specific environmental topics such as clean air, water, and waste material.

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Of particular relevance is the 2009 Executive Order 13514, “Federal Leadership in Environmental, Energy and Economic Performance”. This executive order requires federal agencies to meet ambitious sustainability goals for their own operations and account for their direct and indirect environmental impacts. The policies in this element have been updated to support the goals of EO 13514.

Additionally, another relevant law is the 2007 *Energy Independence and Security Act* (EISA). Under Section 438 of EISA, Congress requires federal agencies to provide national leadership to reduce water quality problems from stormwater runoff. The law specifically calls for federal developments that exceed 5,000 square feet to maintain or restore pre-development hydrology of federal locations. EPA, in close coordination with other federal agencies, has written technical guidance to help federal agencies implement EISA. The guidance focuses generally on retaining rainfall on-site through infiltration, evaporation/transpiration, and re-use of water resources to the same extent as occurred prior to development. Many federal agencies now comply by using a variety of stormwater management practices often referred to as “green infrastructure” or “low impact development” practices.

The extent of the federal presence in the National Capital Region, including significant federal landholdings, and the proximity of federal facilities to significant natural resources make it imperative that specific efforts be made by federal facilities to follow the spirit, as well as the letter, of the policies embodied in NEPA, related laws and executive orders.

## Federal Environment Policies Areas

### Climate Change

Climate change, a significant and lasting shift in weather patterns over periods of time ranging from decades to millions of years, is a critical issue for the National Capital Region, the country, and the international community. For example, recent U.S. and international studies of climate change document that global average sea level rose approximately 1.7 millimeters per year through the twentieth century, after a period of little change during the previous two thousand years.<sup>1</sup> In the region, a 2008 Metropolitan Washington Council of Governments’ study found that the shorelines of the Chesapeake Bay and the Potomac River are among the region’s most threatened resources from the effects of climate change. Climate change also affects the type, frequency and intensity of weather events, including heat waves, significant storms, floods and droughts. Scientists identify a number of factors that contribute to climate change, such as oceanic circulation, solar radiation, and human activity. Though predicting these types of events is difficult, identifying physical vulnerabilities is a critical step towards understanding how climate change impacts the planet, human health, society and the natural environment.

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<sup>1</sup> *Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, 2007.

Federal and local agencies are focusing on two important aspects of climate change: 1) how to minimize further climate change from occurring; and 2) how to plan for and address the impacts of climate change. The key to minimizing further climate change in the future is to reduce greenhouse gas (GHG) emissions. The use of non-renewable fossil fuels such as coal, oil, and gas produce greenhouse gas emissions which enter the Earth's atmosphere and prevent heat from escaping into space. As a result the planet grows warmer and is more susceptible to extreme weather events. GHGs are categorized into three broad scopes. Scope 1 emissions are direct emissions derived from sources that are owned or controlled by the reporting entity; for example, federal buildings. Scope 2 emissions are indirect emissions derived from the consumption of purchased electricity, heat or steam. Emissions from a central utility plant that heats and cools a federal building are an example of Scope 2 emissions. Scope 3 are indirect emissions from sources not owned or directly controlled by the entity but related to the entity's activities, such as employee travel and commuting. The federal government administers a wide array of public-private partnerships to reduce Scope 1, 2, and 3 GHG emissions in the United States. In the National Capital Region and elsewhere, these programs focus on energy efficiency, renewable energy, agricultural practices, subsidizing alternative modes of transportation, and implementation of other technologies to achieve GHG reductions.

In addition to reducing greenhouse gas emissions, the federal government is committed to planning for and addressing the impacts of climate change, referred to as climate adaptation. The Federal Environment Element supports the recommendations of *The 2010 Progress Report* of the federal Interagency Climate Change Adaptation Task Force, a multi-agency group that studied the issue of climate change and adaptation. In 2011, CEQ issued a set of implementing instructions for federal agencies that integrate climate change adaptation into their planning, operations, policies, and programs. CEQ also advised federal agencies to adapt their actions to climate change impacts throughout the NEPA process.

The U.S. Climate Change Science Program (CCSP) examined the potential effects of climate change in the National Capital Region in 2009. *Coastal Sensitivity to Sea-Level Rise: A Focus on the Mid-Atlantic Region* documents climate change effects - particularly for sea-level rise - as major issues to be considered in Washington, DC. Vulnerability to threats associated with rising sea levels is compounded by high population densities along coastal areas and rivers leading to major estuaries, such as the Chesapeake Bay. Low-lying areas in Washington, DC and locations along water bodies, including the Anacostia and Potomac Rivers are areas which could be affected by rising sea levels. Even the rise of a few feet would exacerbate the effects of storms, tides, or floods and increase the risk of damage. There are significant numbers of federally-owned properties in these locations, including parkland, military installations, museums and agency headquarters. Sea-level rise and variability in weather events is likely to exacerbate the frequency and intensity of river, urban drainage and storm surge flooding.

In addition to flooding and weather variability, climate change is anticipated to exacerbate the urban heat island effect and negatively impact air quality, with attendant human health risks. Climate change is also likely to negatively impact natural resources and ecosystems. The governments of Maryland, Virginia and the District of Columbia are all assessing the impacts of climate change on their distinct rural and urban areas. The District of Columbia, for example, is addressing GHG effects by pursuing dense urban development patterns, transit availability and

human-scaled walkable neighborhoods to reduce the need for automobile transportation and ultimately vehicle emissions.

Federal agencies in the National Capital Region are evaluating how climate variability and change will impact operations and service, and are beginning to integrate adaptation into their planning processes. This element reflects (1) newly-established federal adaptation policies; (2) increased sharing of climate adaptation expertise and information across agencies; and (3) ongoing development of adaptation plans in accordance with the Interagency Climate Change Adaptation Task Force's guiding principles, including risk management. Finally, there is a clear need for cooperation on a regional level to help shape policy, address impacts, formulate adaptation strategies, and analyze options for mitigating climate change. The federal government can play a key role in this effort by identifying its own impacts regionally and accounting for climate change in its initiatives.

### **POLICY SECTION A: Climate Change**

To minimize future climate change, federal actions in the region should conform to the following policies:

1. Implement sustainable building design and transportation to address the challenges of climate change and advance projects that will minimize fossil fuel consumption and reduce greenhouse gas emissions.
2. Establish compact, transit-oriented development to reduce greenhouse gas emissions.
3. Pursue opportunities with vendors and contractors to reduce greenhouse gas emissions (i.e., transportation options and supply chain activities).
4. Decrease, and where possible, eliminate use of chemicals directly associated with greenhouse gas emissions.
5. Develop and implement innovative, agency-specific policies and practices to reduce Scope 3 greenhouse gas emissions in agency operations.
6. Ensure all new federal buildings that enter the planning process in 2020 and thereafter are designed to achieve zero-net-energy standards by 2030.
7. Institute aggressive development of energy districts in federal project construction involving multiple buildings and/or other physical assets. Increase renewable energy and renewable energy generation on federal agency properties.
8. Ensure that climate change impacts are addressed in long range plans, particularly:

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- Risk of flooding
  - Pollutant levels in runoff
  - Soil erosion
  - Increased stormwater runoff
  - Temperature extremes
  - Impact to tree viability and vegetation
9. Assist in the development of regional climate adaptation and resilience (also called reliability and risk management) plans to assist the National Capital Region and individual localities with vulnerability assessments, adaptation planning, and emergency preparedness. Many climate change impacts arise not specifically from climate hazards alone, but from a combination of factors.
10. Support the analysis of impacts from climate change on and risks to the region's transportation infrastructure, buildings, and populations in low-lying areas, and in particular federal lands and facilities adjacent to the Potomac and Anacostia Rivers.

#### NCPC Strategic Sustainability Performance Plan

In accordance with EO 13514, NCPC publishes and implements an agency *Strategic Sustainability Performance Plan*. This plan includes benchmarks to ensure that the goals of the executive order are fully integrated into the agency's activities. NCPC is committed to making the federal government a leader of sustainability.

Many of the agency's priorities and significant efforts already fully support the goals and requirements of EO 13514. A brief summary of these activities include:

- Updating and expanding the Federal Elements of the *Comprehensive Plan for the National Capital* to reflect new policy, regulations, and executive orders including those that promote a sustainable capital city and support federal activities in areas such as green building, energy efficiency, and low impact development.
- Revising its policies and review requirements pertaining to federal facility site selection, transportation planning, and building design. The new guidelines can serve as an enforcement tool for EO 13514 in the National Capital Region, and help ensure that federal agencies meet their greenhouse gas reduction goals.
- Working closely with the Metropolitan Washington Council of Governments (MWCOCG) to advance Greater Washington 2050, a regional initiative to guide future development decisions. The Commission adopted a resolution in support of two key components of the Greater Washington 2050 initiative: the *Region Forward* report and MWCOCG's efforts to have local jurisdictions work towards shared goals.
- Developing a precinct-scale Ecodistrict plan for the 10th Street and Maryland Avenue, SW corridors that will demonstrate how a community of federal buildings, related public infrastructure, and open space can function together as an environmentally low-impact

unit to decrease energy use, eliminate greenhouse gas emissions, manage stormwater runoff, and reduce long-term operational costs.

- NCPC has implemented several operational standards to help reduce our GHG emissions. Over 95-percent of our employees walk, bike, or take public transportation to work.

### Air Quality

Air quality has increasingly become a major environmental concern for the region. Although Washington does not historically have “smokestack” industries, population growth and related automobile use has made air quality one of the region’s leading environmental issues. In addition to detrimental effects on human health, air pollution degrades visibility that is especially critical to the region’s view sheds. Air pollution and accompanying acid rain also causes the deterioration of sensitive materials in many historic federal buildings, memorials, and other susceptible structures.

The federal government’s activities and policies directly impact on air quality. Many federal employees use public transit; however, the federal government should increase its efforts to promote transit usage through operational policies and the location and design of its facilities. Other federal activities contribute to air pollution, including facility emissions from heating and air conditioning systems, power generators, and waste incinerators. Many agencies are incorporating “green” building materials and systems, which can support indoor air quality and minimize power generation requirements.

Air quality in the Washington region has improved since the mid to late 1990s; however, the region is classified as a nonattainment area for two pollutants. In accordance with the Clean Air Act of 1990, EPA established National Ambient Air Quality Standards (NAAQS) for six “criteria pollutants:” carbon monoxide, lead, nitrogen oxide, ozone, particulate matter, and sulfur dioxide. Areas where a criteria pollutant level exceeds the NAAQS are designated as “non-attainment status.”

The Washington region is in non-attainment status for ozone and fine particulates. Exhaust from cars, trucks, and buses primarily cause high ozone levels. The highest ozone levels tend to be on hot days with stagnant air. Federal agencies and the public can participate in Ozone Action Days when special measures temporarily reduce the emissions. These measures can help address the episodic nature of this type of air pollution; however, the region must also broadly reduce vehicular use and encourage alternative fuel vehicles to achieve longer term environmental goals. State Implementation Plans (SIPs) identify measures to help the region meet air standards, including transportation control measures designed to offset auto emissions. In 2005-2006, EPA approved SIPs submitted by the District of Columbia, the State of Maryland and the Commonwealth of Virginia.

The federal government should continue to demonstrate its leadership in addressing the region’s air quality concerns through the national standards established by EPA and other federal

agencies to improve vehicle and facility emissions, as well as through the local practices of federal agencies and their employees. Federal agencies and employees can improve air quality by: choosing low-polluting transportation modes, reducing vehicle trips and trip lengths, conserving energy, and using low-polluting energy sources for buildings.

### **POLICY SECTION B: Air Quality**

Federal actions in the region should conform to the following policies:

1. Mobile sources of air pollutants should be reduced by:
  - Encouraging federal, state, and local governments as well as private employers to support improvements to and utilization of public transportation systems.
  - Further decreasing federal employee usage of single-occupant vehicles through operational policies, such as Transportation Demand Management techniques, and the location and design of workplace facilities. Transportation Demand Management techniques are defined by the Transportation Element.
  - Encouraging further usage of alternative clean fuels (e.g., hybrid, fuel cell, compressed natural gas, and “clean” diesel fuels) and promoting the use of Alternative Fuel Vehicles (AFVs). Alternative fuels are defined by federal law.
  - Support establishing alternative fueling locations for future AVFs added to the federal transportation fleet.
  - Encouraging the use of aircraft that meet or exceed the current emission standards set by EPA.
2. Stationary sources of air pollutants should be reduced by:
  - Minimizing power generation requirements, such as by utilizing best available green building systems and technologies.
  - Utilizing less-polluting sources of energy (e.g., solar, geothermal, and wind).
  - Encouraging the development and use of alternative energy sources to reduce the reliance on fossil fuels.
  - Carefully controlling the incineration of waste materials, particularly those that may contain toxic substances.
3. Indoor air quality should be promoted by using environmentally friendly green building materials, construction methods, and building designs.
4. In response to Ozone Action Days, when the highest ozone levels occur, federal agencies should take measures to temporarily reduce the generation of emissions that contribute to ozone formation.

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## Water Quality

The region's rivers, streams, and groundwater systems are critical natural features and support a diverse array of wildlife and flora. The quality of these features is also important for human use and enjoyment. A variety of sources contribute to the quality of the region's water. In the Washington area, major point source pollution is discharged from the region's sewage treatment plants and combined sewer overflows; and non-point source pollution is produced principally from stormwater and agricultural runoff.

While pollution from specific sources and chemicals used in agricultural settings threaten regional water quality, polluted runoff from urbanized areas is growing and difficult to control. Urbanization has contributed to changes in the region's hydrology. Older stormwater management systems—primarily within the District of Columbia—are not always adequate to handle runoff caused by impervious surfaces within the city. Additional impervious surfaces—primarily in the outlying parts of the region—worsen the problems caused by excessive runoff. As these various pollutants collect in the water system, the natural direction of water flow concentrates these problems within the District of Columbia and areas downstream.

By the late twentieth century, the Potomac and Anacostia Rivers had suffered serious deterioration in water quality. Officials banned fishing in many areas and discouraged direct human contact with the water. In response, federal and local agencies are developing strategies to improve water quality as the Washington region grows. Several efforts are now underway to address these issues, include the Chesapeake Bay 2000 Program. Some solutions will involve careful and coordinated regulation for future land development and densities to minimize impervious surfaces, control runoff, and ensure appropriate buffer areas along rivers, streams, and other sensitive areas. Other solutions require costly modernization of sewer and stormwater management systems. One example is a massive infrastructure project under construction to store and treat both sewage and stormwater to address pollution discharges into the Potomac and Anacostia Rivers from combined sewer system overflows.

Contingency plans are also needed to respond to emergency contaminations. The full cooperation of federal, state, and local government agencies is necessary to meet the need and evaluate the full range of solutions. MWCOG is a focal point for coordinating planning efforts in the region between local, state, and federal agencies.

As development opportunities along portions of the area's waterways are pursued, the importance placed on the quality of the region's waters will increase. The federal government controls a significant amount of shoreline and adjacent property along the Anacostia and Potomac Rivers and related tributaries, particularly in the District of Columbia. The federal interests, goals, and policies that are outlined in this element are directed at protecting the region's waterways for generations to come.

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## Water Supply

The Potomac River supplies about 79 percent of the region's water. The Washington Suburban Sanitary Commission's Patuxent River Plant and Fairfax County Water Authority's Occoquan River Plant provide the remaining balance in roughly equal proportions. Despite occasional low flows in the Potomac River, and ongoing growth in the region, MWCOG projects that the region has sufficient water supply from its regional resources to accommodate expected future demand up to 2040.<sup>2</sup> By the year 2040, however, the current system may have difficulty meeting demand during periods of drought without water use restrictions, and/or the development of additional supply capabilities. The region's major water supply agencies coordinate operations in the Potomac watershed, essentially operating as a single entity in sharing water across the Potomac, Patuxent, and Occoquan basins during periods of low flow.

Federal government operations are dependent on the local water supply system. The federal government should strive to limit water consumption by selecting drought-tolerant landscaping at federal facilities and using new technologies for water recycling. For example, finding ways to use non-potable water for activities such as irrigation at federal facilities reduces demand. The federal government, along with state and local authorities, has a responsibility to help ensure that the region's water supply is protected from accidental or terrorist contamination, and that the future water supply is adequate for federal facility operations, private sector activities, and consumption by the general public.

## The Chesapeake Bay Program

The Chesapeake Bay Program is a regional partnership created in 1983 with the goal of restoring the bay. The bay's watershed includes the National Capital Region, and the program is an important example of federal, state, and local cooperation in an effort to develop guidelines and activities that will improve the health of the bay and its watershed.

In 2009, President Obama issued Executive Order 13508, "Chesapeake Bay Protection and Restoration," which supports the Chesapeake Bay Program by confirming the federal government's commitment to restoring the Chesapeake Bay Watershed. The executive order called for federal agencies to launch major environmental initiatives using new standards and practices and establish milestones for measurable goals.

In response to the executive order, EPA developed its 2010 *Guidance for Federal Land Management in the Chesapeake Bay Watershed*. Among the guidelines included in this document is the '95th percentile' standard under which federal facility managers are required to design, construct, and maintain buildings and landscapes that contain rainfall on-site, and prevent the off-site discharge of the precipitation from all rainfall events less than or equal to the 95th percentile, or to the Maximum Extent Technically Feasible (METF). A 95th percentile rainfall

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<sup>2</sup> According to the Cooperative Water Supply Operations on the Potomac (CO-OP) of the Interstate Commission on the Potomac River Basin (ICPRB).

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event is one where precipitation total is greater than or equal to 95 percent of all storm events over a given period of time.

### **POLICY SECTION C: Water Quality**

Federal actions in the region should conform to the following policies:

1. Strengthen stormwater management practices for federal facilities and federal land to meet federal and regional requirements, and specifically to restore clean water, recover habitat, sustain fish and wildlife, and increase public access.
2. Upgrade water supply and sewage treatment systems, and modernize storm and sanitary sewer systems, to avoid the discharge of pollutants into waterways.
3. Avoid the use of pesticides, herbicides, fertilizers, chemicals, oil, salts, and other threats to prevent the pollution of groundwater and waterways.
4. Use pervious surfaces and retention ponds, if appropriate to the site, to reduce stormwater runoff and impacts on off-site water quality.
5. Avoid actions that could have significant long-term adverse effects on aquatic habitats, such as dredging and filling operations that disrupt and destroy organisms.
6. Encourage the use of innovative and environmentally-friendly “Best Management Practices” in site and building design and construction practice, such as green roofs, rain gardens, and permeable surface walkways, to reduce erosion and avoid pollution of surface waters.
7. Preserve or restore predevelopment runoff to meet at least a 95<sup>th</sup> percentile storm event.
8. Require wastewater reduction through conservation and reuse in all new federal buildings and major federal renovation projects consistent with the *Energy Independence and Security Act of 2007* and all other applicable policies.
9. Participate in regional agreements and programs that improve water quality and address watershed issues.

### **POLICY SECTION D: Water Supply**

Federal actions in the region should conform to the following policies:

1. Encourage the natural recharge of groundwater and aquifers by limiting the creation of impervious surfaces, avoiding disturbance to wetlands and floodplains, designing

stormwater swales and collection basins on federal installations, and using pervious surfaces wherever possible.

2. Promote water conservation programs and the use of water-saving technologies including landscaping and irrigation strategies that conserve and monitor water consumption in all federal facilities.
3. Encourage the implementation of water reclamation programs at federal facilities for landscape irrigation purposes and other appropriate uses.
4. Reduce or eliminate the use of potable water – water that is safe for humans to drink - for landscaping or water features.

### Land Resources

The National Capital Region contains a wide variety of sensitive land resources, including floodplains, wetlands, sensitive soils, vegetation, and wildlife habitats. The environmental and public benefits derived from these resources should be considered during the planning and development of federal lands to ensure conservation and balanced management of the National Capital Region's ecosystem.

Environmental regulations, such as NEPA and the *Endangered Species Act* of 1973 have better equipped federal agencies to diminish adverse impacts on land resources as they implement their development needs. The Commission uses NEPA during review of project submissions.

“Best Management Practices” developed by government agencies and other experts provide additional guidance. Consultation with local governments is particularly important to assure consistency with local data and policies.

As federal agencies conduct their activities and fulfill their missions, building within sensitive areas may be unavoidable. The policies included in this element guide federal agencies in developing plans and programs that protect and conserve endangered and threatened species; preserve and enhance the natural value of wetlands; and avoid the impacts associated with the occupancy and modification of floodplains.

### Floodplains

Floodplains are the land areas near waterways that are subject to periodic flooding. Floodplains perform important water management functions, including temporarily storing groundwater, which helps to reduce peak flows; maintaining water quality; recharging groundwater; and preventing soil erosion.

Floodplains can also provide habitat for wildlife, recreational opportunities, and aesthetic benefits. The federal government surveys and maps floodplains to plan for human activity and

investment. Federal policy discourages placing permanent facilities in floodplains or altering their natural function.

Extensive federal property in the region is located within floodplain areas. Some lands are used appropriately for parkland and memorials, or developed with water-related uses such as boathouses. Planning and operations at these flood-prone facilities should involve preserving or restoring the natural state of the floodplain to the greatest extent possible.

### Flood Protection in the Nation's Capital

In the Washington, D.C. region, a significant number of federal properties and buildings-including agency headquarters, cultural institutions, and iconic monuments-are located in areas at risk of flooding. In particular are the areas along rivers, streams and the monumental core that are located in the lowest points in the "topographic bowl." Executive Order 11988, "Floodplain Management," guides federal agencies to avoid development in floodplains, and where this is not possible, to minimize potential impacts and ensure that development does not exacerbate possible flood impacts.

Historic river floods led to the construction of a levee system that runs through the National Mall and into Southwest Washington. Improvements to that levee are anticipated to be complete by 2012 and will ensure that it can protect against a 185-year storm event. There are additional levee systems along the Anacostia River. For the lands on the river sides of the levees, including many federal parks, flood recovery -rather than flood protection- is the goal.

The same topographically-low areas of the city are also subject to flooding from stormwater. A 2006 flood highlighted the risk to buildings and infrastructure within the historic Federal Triangle. The flood affected government operations, such as power outages which compromised building monitoring systems and high-speed communications. At risk were some of the nation's most irreplaceable cultural buildings and treasured artifacts. The resulting cost to the federal government and the local economy was significant.

Subsequently NCPC, along with other federal and District of Columbia agencies, conducted an in-depth analysis of the hydrologic conditions and stormwater and drainage system capacity of the Federal Triangle watershed to predict areas most at risk for flooding. This study and associated mapping aided in planning for revised development and investment. But, as the analysis of the flooding demonstrated, the scale and cost of structural solutions that can prevent future flooding is no small proposition and will require major public investments over a long period of time.

### Wetlands

Wetlands are generally defined as lands that are wet for significant periods during the year, including marshes, swamps, and bogs. Wetlands are a significant part of the National Capital Region's ecosystem, providing fish and wildlife habitat, flood protection, erosion control, and maintenance of water quality. Human development often disturbs wetlands directly or indirectly

by altering the hydrology of an area. The steady conversion of undeveloped land to impervious surface is an ongoing threat to the region's wetlands which results in increased stormwater runoff (causing erosion and pollution) and requires water treatment facilities.

Federal policies discourage disturbance of wetlands and the general patterns of development that alter their function in the natural ecosystem. The federal government is also striving to restore natural streams and to establish planted buffers along waterways.

### Soils

Soils are a critical component of the environment, helping to support clean air and water, productive forests, diverse wildlife, and beautiful landscapes. The soil's function is based on its composition and nutrient health. Soils generally perform five essential functions:

- Sustain plant and animal life.
- Regulate water flow, by temporarily absorbing water from rain, melting snow, or irrigation.
- Filter potential pollutants through the mineral and microbial components of the soil.
- Cycle nutrients that are stored and transformed in the soil for use by plants and animals.
- Support vegetation and man-made structures. In addition, many archaeological resources are preserved within the soil.

Soil qualities can vary naturally, including differing degrees of stability and nutrients. Soil quality is not easily altered, but soil is subject to erosion as well as pollutants.

### Tree Canopy and Vegetation

The National Capital Region's Tree Canopy and vegetation provides aesthetic appeal, as well as food and habitat for wildlife. Vegetation also provides root systems that help maintain soil integrity, natural aquifers, and recharge areas. It also reduces erosion, particularly on steep slopes and areas adjacent to waterways. Large trees, especially in groupings, are a particularly valuable environmental resource. The tree canopy in Washington, DC includes an estimated 2,584,000 trees with a tree cover of 28.1 percent, including forested and urban areas.<sup>3</sup> Urban vegetation can directly and indirectly affect local and regional air quality by altering the built environment.

Four main ways that urban trees improve air quality include:

- Temperature reduction and other microclimate effects.

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<sup>3</sup> An assessment of the vegetation structure, function, and value of the Washington urban forest was achieved in 2009 by the Urban Forest Effects (UFORE) model developed by the U.S. Forest Service, Northern Research Station, in conjunction with the Casey Tree Foundation.

- Removal of air pollutants.
- Emission of volatile organic compounds (VOC) and tree maintenance emissions.
- Energy effects on buildings.

Studies reveal that increased tree canopy cover also helps reduce ozone concentrations. In the District of Columbia, the greatest pollutant removed by tree cover is ozone<sup>4</sup>. It is estimated that trees remove 492 tons of air pollution per year with an associated value of \$2.30 million, based on estimated national median externality costs associated with pollutants). Urban trees also help mitigate climate change by sequestering atmospheric carbon from carbon dioxide.

In addition to these environmental contributions, trees also shade buildings and homes, which reduce energy consumption and provide quality settings for habitation. The federal government should continue to protect and restore urban vegetation, including tree canopy, wherever possible.

### **POLICY SECTION E: Land Resources – Floodplains**

Federal actions in the region should conform to the following policies:

1. Prohibit hazardous activities in floodplain areas.
2. Encourage modification of existing developments to remove or mitigate flood hazards, restore floodplain values, and improve water management. If the necessary modifications cannot be accomplished, the buildings should be removed when feasible to allow restoration of the floodplain and to correct flood hazards and restore floodplain values.
3. Discourage investment in floodplain areas unless related to correcting flood hazards, restoring floodplain values, or supporting appropriate recreational or memorial uses.
4. If construction in a floodplain is necessary: (a) preserve natural drainage where possible; (b) elevate structures above base flood level; (c) use best available flood proofing and protection measures; and (d) return the site as closely as possible to its natural contours.

### **POLICY SECTION F: Land Resources –Wetlands and Watersheds**

Federal actions in the region should conform to the following policies:

1. Avoid any physical or ecological destruction of or damage to wetlands and riparian areas. Avoid development of areas that contain wetlands, including isolated wetlands. Enhance degraded wetlands to compensate for any wetland or other natural values lost as part of site development.

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<sup>4</sup> Ibid.

2. Avoid any intensive land uses within or adjacent to wetlands and riparian areas. Appropriately sized open space buffers should be maintained around wetlands or riparian areas.
3. Coordinate wetland activities with federal, state, and local government programs and regulations, including the Chesapeake Bay Program. Support local and regional watershed implementation plans and regulations.
4. If construction in a wetland is necessary, utilize the highest standard in project development requirements to minimize adverse impacts.

### **POLICY SECTION G: Land Resources – Soils**

Federal actions in the region should conform to the following policies:

1. Discourage development in areas of identified high erosion potential, on slopes with a gradient of 15 percent and above, and on severely eroded soils. Excessive slopes (25 percent and above) should remain undeveloped.
2. Employ Best Management Practices to reduce the potential for soil erosion and the transport of sediment, consistent with state and local requirements.
3. Limit uses on highly unstable soils to passive recreation and open space.
4. Locate and design buildings to be sensitive to natural groundwater flows. Avoid development in areas where mineral resources, such as diabase clay and shale, are located.
5. Identify and protect soil protection zones.
6. Create and implement an erosion control plan during construction to prevent damage or loss of critical soils.
7. Avoid soil compaction during construction and maintenance.
8. Minimize tree cutting and other vegetation removal to support soil structure (slope geometry, location and geologic content), reduce soil disturbance, and limit erosion. When tree removal is necessary, replace trees, shrubs, and other vegetation to prevent a net vegetation loss.

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## POLICY SECTION H: Land Resources – Vegetation

Federal actions in the region should conform to the following policies:

1. Preserve existing vegetation, especially large stands of trees. When tree removal is necessary, trees should be replaced to prevent a net tree loss to the project area. An evaluation of potential tree loss should be made prior to any removal. Trees of 10 inch diameter or less will be replaced on a one-for-one basis. Significant trees (diameter greater than 10 inch) will be replaced at a rate derived from a formula of the International Society of Arboriculture, or as established by the local jurisdiction's requirements for tree replacement
2. Enhance the environmental quality of the National Capital by replacing existing trees where they have died or where they have been removed due to development. Tree replacement should adhere to the standards and guidelines of the local jurisdiction.
3. Incorporate new trees and vegetation to moderate temperatures, minimize energy consumption, and mitigate stormwater runoff. This includes the use of vegetation in the design and development of 'green roof' projects where feasible and consistent with local regulations.
4. Conserve plant communities native to the site's ecoregion (as defined by the Council on Environmental Quality). Protect and/or restore areas containing native plant communities, and provide habitat corridors connecting to off-site natural areas or buffers adjacent to off-site natural areas for migrating wildlife.
5. Maintain and preserve woodlands adjacent to waterways, especially to aid in the control of erosion, sediment, and thermal pollution.
6. Encourage the use of native plant species and remove invasive plants where appropriate.
7. Protect and preserve all vegetation designated as special status plants (SSP)<sup>5</sup>.
8. Use vegetation to minimize building heating and cooling requirements.
9. Use trees and other vegetation to offset emissions of greenhouse gases from operations. Plant and maintain trees and other vegetation to achieve long-term storage of carbon dioxide following accepted protocols that ensure offsets are permanent and verifiable.
10. Support sustainable practices in federal landscape development to include but not be limited to:

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<sup>5</sup> Special status plants (SSP) are those plants that are legally protected under the federal Endangered Species Act (ESA), or other federal and state regulations, along with species considered sufficiently rare by the scientific community to qualify as defined by the Council on Environmental Quality recommendations, *Guidance for Federal Agencies on Sustainable Practices for Designed Landscapes*.

- Use of sustainable soil amendments,
  - Reduced irrigation runoff,
  - Reduced greenhouse gas emissions,
  - Use of Integrated Pest Management practices,
  - Reduced potable water consumption, and recycling all organic matter
11. Use of grass species as lawn should be limited to recreational areas so that major reductions in water, chemicals, maintenance energy, pollution, noise, and labor occur. Where turf grass is used, species and cultivar selection should reflect the local climate and growing conditions.

### **POLICY SECTION I: Land Resources - Wildlife Habitats**

Federal actions in the region should conform to the following policies:

1. Encourage facility design and landscaping practices that provide cover and food for native wildlife.
2. Discourage development or significant alteration of areas used by migratory wildlife.
3. Consider the impacts, including cumulative impacts, of environmental changes on wildlife habitats and the biodiversity of an ecosystem. Consideration should extend to non-protected areas, as well as areas protected by designations such as parks and wetlands.
4. Create and maintain inventories of species and natural resources and encourage regional cooperation to protect natural areas and species.

#### **Environmental Justice**

Environmental justice is the disproportionate impact of environmental pollution on particular segments of the population, a concern in the National Capital Region. Minority and low income populations, in particular, bear a disproportionately high burden from pollution, both economically and in quality of life.

The federal government has the opportunity to address environmental justice issues in the National Capital Region for several reasons: the proximity of federal facilities to residential communities, businesses, public recreation areas, and visitor attractions; distribution of significant numbers of federal property and facilities throughout the region; and the historic use of select federal facilities for environmentally hazardous operations. Federal agencies also

contribute to social equity and environmental stewardship by rehabilitating under-utilized and/or contaminated properties, (often called grayfield and brownfield sites), which are often located in minority and low-income areas. Federal agencies have a responsibility to be good neighbors and to promote and support the general health and welfare of all sectors of society.

### **POLICY SECTION J: Environmental Justice**

Federal actions in the region should conform to the following policies:

1. Identify and address any disproportionately high and adverse health or environmental effects on minority and low-income populations resulting from agencies' programs, policies, and activities. Consider the indirect, multiple, and cumulative effects of actions on the cultural, social, historical, and economic characteristics of an affected community.
2. Analyze and consider, as prescribed by NEPA, the demographics of a potentially affected area to determine whether such communities are characterized by low-income levels or high minority populations.
3. Establish effective public outreach programs so that the affected community can participate in decisions that will impact its future.
4. Prioritize and support the re-use of brownfield sites for federal or private-sector redevelopment.
5. Adhere to the federal guidelines where appropriate of the Department of Housing and Urban Development's *Site and Neighborhood Standards* which strongly encourages development to be located in areas having access to amenities like transportation, educational, and health facilities.

#### **Solid Waste**

At the regional level, solid waste typically includes two major categories: ordinary trash from households or commercial activities, and sludge from wastewater treatment systems (such as the Blue Plains Advanced Waste Water Treatment Plant). Solid waste management involves three strategies:

- Reducing the amount of waste generated.
- Recycling waste material.
- Effectively disposing of waste that cannot be recycled.

*The Pollution Prevention Act* of 1990 established national policy related to waste: pollution should be prevented, whenever feasible; pollution that cannot be prevented should be recycled;

pollution that cannot be prevented or recycled should be treated in an environmentally responsible manner; and disposal should be employed only as a last resort. Under *E O 13423, Strengthening Federal Environmental, Energy, and Transportation Management*, the goals were expanded such that each agency must meet the national 35 percent recycling standard. Each agency should recycle materials to the maximum extent practicable, considering cost, cost avoidance, return on investment, and availability of markets. Recycling programs should comply with applicable federal, state, and local recycling requirements and can include cooperative programs with other federal facilities, state or local agencies, or non-profit organizations.

Federal agencies, including the General Services Administration, implement additional recycling measures. Several federal agencies participate in the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) Program. The LEED program identifies a rating system for existing buildings that establish recycling goals of 30 to 75 percent.

For the remaining solid waste, disposal can cause significant environmental problems. Two methods are commonly used: incineration at waste-to-energy facilities, and landfill. Incineration plants, if properly designed with pollution control technology, can be a valuable solution. Landfills must also be carefully designed, to avoid degradation of surface and ground water. The transportation of solid waste also typically requires the use of transfer facilities, to consolidate waste from local trucks into larger shipments. The location of these transfer facilities, as well as incineration and landfill facilities, causes public concern. The emphasis on reduced waste generation is a critical goal.

### **POLICY SECTION K: Solid Waste and Hazardous Materials Management**

Federal actions in the region should conform to the following policies:

1. Development projects should reuse or recycle salvaged building and organic materials to conserve resources and encourage procurements that increase the purchase and use of products containing recycled content.
2. Implement waste reduction measures that extend the life of waste disposal systems and reduce energy demand, including recycling programs, composting, and utilizing biodegradable products.

#### **GSA's Recycling Initiatives**

GSA, as a major building management agency for the federal government, procures recycling contracts that are used by over 100 federal agencies from the executive, legislative, and judicial branches. In 2011, over 100 federal sites with more than 110,000 federal employees participated in the GSA recycling program. In fiscal 2011, the GSA National Capital Region collected 8859 tons of recycled materials that generated \$562,036 in revenue. The recycling program saved

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\$630,583 in landfill cost, 27,300 cubic yards of landfill space, 136,000 trees, 3.5 million gallons of oil, 36 million kilowatts of electricity, and 57 million gallons of water.

Currently, GSA recycling contracts have targets ranging from 61 to 100 percent for all grades of paper. At some facilities, GSA also recycles metal, glass, and plastic with a target rate of at least 50 percent; however, recycling of these other materials is often not cost-effective. Still, these target goals are high and represent important contributions by federal agencies in the region, equaling local-government or private-sector recycling programs.

GSA also uses the procurement process to reduce waste flow. GSA strives to use designated green items. GSA requires federal contractors to identify items that have recycled content (using EPA criteria); are energy and/or water conserving; and have reduced pollutants.

Some federal facilities such as military bases and research labs handle hazardous materials that could pose risks to humans and to the environment if not managed properly. In some cases these facilities are located in proximity to residential communities, businesses, and public recreation areas. An increased awareness of the potential for contamination has led to significant improvements in the safe transfer and disposal of hazardous materials, in accordance with local, state, and federal guidelines and procedures. The proper management of hazardous materials has long been a community concern, and is now of paramount importance given its possible association with terrorism.

The proper management of hazardous materials significantly affects the regional economy and human health. The release of toxic chemicals from damaged or leaking underground storage tanks can lead to contamination of natural aquifers, estuaries, ground water resources, and the regional water supply. Without regular maintenance and monitoring, underground tanks could also produce hazardous leachate, resulting in soil contamination that would leave federal or nearby land unsuitable for federal use, private development, or recreational use by the general public. Historic federal buildings may contain potentially hazardous materials that must be carefully controlled.

While agencies have made significant improvements to the procedures supporting the safe transfer and disposal of hazardous materials, the topic remains a concern. The management of hazardous materials is particularly important in the region, where federal facilities are often located near highly populated areas and sensitive habitats.

### Light Pollution

NCPC considers the effects of lighting on existing resources from both an aesthetic and an environmental perspective. For example, lighting levels for several projects near the Lincoln Memorial were reviewed to ensure that views to and from the memorial were not adversely affected.

Light pollution first became a concern in the 1970s when astronomers identified the increase in lighting associated with development as a contributing factor in the degradation of the night

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sky's visibility. Recent studies suggest that lighting associated with air safety and buildings disorient migrating birds. Studies have also linked excessive exterior lighting to air pollution, according to a study by scientists at the National Oceanic and Atmospheric Administration (NOAA) and the Cooperative Institute for Research in Environmental Sciences (CIRES) at the University of Colorado.<sup>6</sup> EPA identified light pollution as a major concern in exterior lighting in its 2008 *ENERGY STAR Building Upgrade Manual*. EPA recommends that agencies use outdoor lighting codes to encourage better-quality lighting that reduces glare, light trespass, and energy waste.

A subsequent EPA report noted these concerns as well as the visibility and safety benefits of artificial night-time lighting, and stated that “it is relatively easy to tackle [light pollution] without needing to make significant trade-offs, simply by eliminating upward and horizontal spillage and turning off unnecessary lighting.”

In response to these environmental concerns, “dark sky” advocates promote changes in lighting design and technology. This section is designed to help federal agencies incorporate exterior lighting in a manner that minimizes negative aesthetic and environmental impacts.

### **POLICY SECTION L: Light Pollution**

Federal actions in the region should conform to the following policies:

1. Sources of light pollution should be reduced by:
  - Selecting the appropriate level of lighting to meet design needs, while minimizing excess light.
  - Designing lighting to eliminate upward and horizontal spillage.
  - Designing and providing appropriate controls to operate lighting only when needed, and at appropriate light levels.
  - Selecting lighting that minimizes maintenance, reduces energy use, and provides better visibility.
  - Selecting appropriate lighting technologies in a historic context.
2. Exterior lights should be fully evaluated for their effectiveness, maintenance requirements, and energy use.
3. All exterior lighting should be switched off when not required.

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<sup>6</sup> H. Stark, S. S. Brown, K. W. Wong, J. Stutz, C. D. Elvidge, I. B. Pollack, T. B. Ryerson, W. P. Dube, N. L. Wagner & D. D. Parrish, “City lights and Urban air”, *Nature Geoscience*, Published by Nature Publishing Group: Oct 31, 2011 pp730 – 731.

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## Noise Pollution

Noise is an invisible pollution that affects general health and welfare. Noise pollution can lead to increased stress, hearing loss, a decline in productivity, higher health care costs, and reduced property values. Common sources of noise pollution include: airplanes, automobiles, boats, construction, loading docks, industrial activities, and outdoor concerts and special events.

One of the most controversial noise issues in the region results from flight operations at military airfields and at commercial airports such as Ronald Reagan Washington National Airport. There is also increasing concern about the impact of noise from helicopters and fixed wing aircraft on populated areas. While modern technology has reduced noise levels produced by commercial aircraft, growth in air traffic may have offset some of these improvements.

Noise pollution will continue to be a concern in the absence of policies and technologies that can further mitigate noise levels. The federal government should reduce its contribution to noise pollution and coordinate with local governments to avoid proximity of noise generating activities to sensitive natural resources and land uses.

### **POLICY SECTION M: Noise Pollution**

Federal actions in the region should conform to the following policies:

1. Avoid locating activities that produce excessive noise near sensitive natural resources and land uses such as residential areas, hospitals, schools, and major public and civic destinations.
2. Locate, design, and construct improvements to roads, driveways, loading docks, and parking lots for federal facilities in a manner that is sensitive to existing adjacent land uses.
3. Ensure that construction activities comply with local noise ordinances, and coordinate with local governments and adjacent communities to establish limits on the intensity and hours of noise generation.

## Energy Conservation

Energy conservation is important because it improves efficiencies in facilities and can provide significant cost savings to the federal government. It also supports long-term environmental goals, such as national energy independence. Federal agencies located within the National Capital Region provide many resources to support energy conservation. For example, EPA offers a range of programs, including ENERGY STAR and WasteWise. ENERGY STAR's Portfolio Manager assists agencies to understand and benchmark energy use. EPA's Laboratories

for the 21<sup>st</sup> Century (LABS21) program provide a similar tool for agencies including EPA, the Department of Energy, and the National Institutes of Health.

Specific agency energy requirements are outlined in E.O. 13514, EISA and the 2009 Omnibus Appropriations Act which codified EISA into law. EISA requires agencies to upgrade existing heating, ventilation, and air conditioning (HVAC) systems at federal facilities to make them more energy-efficient using both appropriated budgets and the energy savings performance contracting mechanism to fund these upgrades.

Agencies may also explore improving environmental performance through the commissioning and recommissioning process of development. In new design and construction processes, commissioning begins at the onset of development, to ensure the systems under design meet specified performance requirements. Commissioning also ensures that the equipment is installed appropriately. Recommissioning is the process through which buildings are commissioned again at some time after their initial completion, occupancy, and commissioning. Recommissioning is a check to ensure that building systems are still functioning as originally planned.

Agencies can improve environmental performance reviews at several development stages. In new design and construction processes systems can be checked during design to ensure they meet specified performance requirements, and again to ensure that equipment is installed appropriately. This type of review can also occur after buildings have been completed.

### **POLICY SECTION N: Energy Conservation**

Federal actions in the region should conform to the following policies:

1. Improve environmental performance and reduce costs in existing federal buildings through targeted energy improvements, such as:
  - Optimizing the efficiency of heating, ventilation, and cooling (HVAC) systems with more efficient boilers, motors, and variable-speed drives.
  - Reducing energy and maintenance costs by installing centralized energy management systems.
2. Reduce fossil fuel-generated energy consumption by 55 percent compared to an FY 2003 baseline for new and renovation projects. The required reduction under law is consistent with EISA, with designs for new buildings or major renovations begun in FY 2030.
3. At least 30 percent of hot water demand in new or renovated federal buildings should come from solar hot water heating, if life-cycle cost-effective. Existing buildings with minor renovations must incorporate the most energy-efficient designs, equipment, and controls.
4. Locate and construct federal facilities to minimize energy loss in long-distance energy transmission.

5. Pursue energy conservation techniques at a multi-building district-level.

#### Radiofrequency Radiation and Electromagnetic Fields

The federal government has extensive requirements for antenna as part of the communication needs of government operations in the nation's capital. In addition, widespread mobile phone use has resulted in the proliferation of new private-sector antenna and related towers throughout the region, resulting in a surge of requests for antenna and related towers on federal property. The cumulative effect of these antenna significantly impacts the visual quality of the nation's capital and has the potential to impact human health.

The steady population growth in the National Capital Region and related use of wireless communication suggests continued demand for new antenna. Although much of the antenna installation is conducted by private carriers, federal agencies often rely on communication technologies that require locating an array of antenna (e.g. dish, whip, panel) on federal property. During the 1980s and 1990s, the Commission became increasingly concerned about the possible adverse visual and health effects of antennas. In 1997, the National Research Council found "no conclusive and consistent evidence" linking ordinary exposure to electromagnetic fields (EMFs) to adverse biological effects. As research in this area continues, however, the American Medical Association has recommended a policy of prudent avoidance, suggesting that manufacturers and employers begin reducing the exposure of workers and the public to EMF radiation.

The Commission therefore continues to closely monitor the placement of antennas on federal property and relies on the rules and regulations of the Federal Communications Commission (FCC) regarding the environmental effects of radiofrequency emissions. Policies in this element address the impact of antennas on human health and the environment, and are intended to: (1) ensure adequate monitoring of all antenna installations in the region; (2) address the public's concerns for the adequate review of such antenna installations on federal property; (3) provide guidance to federal agencies as they consider antenna proposals; (4) support NCPC's *Guidelines and Submission Requirements for Antennas on Federal Property*; and (5) uphold FCC standards for radiofrequency emissions. Additional policies in the Parks and Open Space Element address the siting and design of antennas and towers.

#### **POLICY SECTION O: Radiofrequency Radiation and Electromagnetic Fields**

Federal actions in the region should conform to the following policies:

1. Evaluate the possibilities for joint-use of antennas and collocating antennas to reduce aesthetic impacts and limit the area of radiofrequency (RF) exposure. Federal agencies should also evaluate the cumulative effect of multiple transmitters at one location to ensure that the combined radiofrequency emissions continue to meet Federal Communications Commission guidelines.
2. Follow a practice of "prudent avoidance" of RF exposure. Federal agencies should reduce the exposure of workers and the public to RF fields where they may be prevalent,

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including those from power lines, antennas, equipment, and other recognized sources of RF and electromagnetic field emissions.

3. Incorporate adequate interior building attenuation measures to reduce RF field penetration into the habitable areas of buildings.
4. Require adequate communication of potential risks where occupational/controlled exposure may be present.
5. Utilize advances in technology, such as fiber optics, cooperative antenna technologies, and teleports; and monitor changes in standards and guidelines for the installation of antennas.
6. Minimize visual impacts of telecommunication antennas proposed for the rooftop of a building with historic value by using a variety of tools including but not limited to matching building colors and design, incorporating screens, moving antennas away from the building's edge, etc. All measures should be coordinated with local historic preservation requirements.