

Final

**ENVIRONMENTAL ASSESSMENT
DECONSTRUCTION OF 13 BUILDINGS
AT NASA LANGLEY RESEARCH CENTER, HAMPTON, VIRGINIA**

Lead Agency: National Aeronautics and Space Administration, Langley Research Center (LaRC), Hampton, Virginia

Proposed Action: Deconstruction of 13 Buildings at NASA LaRC

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Abstract: NASA is proposing the removal of 13 buildings at Langley Research Center (LaRC), located in Hampton, Virginia. Deconstruction of these facilities would begin in 2008 and continue into 2009. The buildings are abandoned or are in the process of being closed, and NASA has determined they are no longer needed. The deconstruction is intended to reduce the Center's infrastructure and allow LaRC to direct limited resources towards facilities that support NASA's overall mission, both currently and in the future. The project would reduce the footprint of LaRC facilities by approximately 3,493 square meters (37,603 square feet) and create additional green space at the Center. This Environmental Assessment evaluates the environmental impacts of the Proposed Action and the No-Action Alternative.

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1.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

1.1 INTRODUCTION

This Environmental Assessment (EA) has been prepared to analyze the potential environmental impacts associated with NASA's proposed deconstruction of 13 buildings at NASA Langley Research Center (LaRC), located in Hampton, Virginia.

This EA was prepared in accordance with the requirements of the National Environmental Policy Act of 1969 (NEPA), as amended (42 United States Code 4321 et seq.), the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations (CFR) Parts 1500–1508), NASA's regulations (14 CFR Part 1216 Subpart 1216.3), and NASA Procedural Requirements (NPR) 8580.1, "Implementing the National Environmental Policy Act and Executive Order 12114." Information contained in this EA will be used by NASA and the appropriate regulatory agencies to facilitate the NEPA decision-making process and to determine if the Proposed Action would significantly affect the quality of the natural or human environment. If implementing the Proposed Action is determined to have significant environmental impacts, an Environmental Impact Statement may be prepared. If the implementation of the Proposed Action is determined not to be significant, the NEPA decision-making process would conclude with a Finding of No Significant Impact (FONSI).

Chapter 1 of this EA includes background information, and the purpose and need for the Proposed Action. Chapter 2 includes a description of the Proposed Action, the No-Action alternative, and a description of an alternative that was considered but not carried forward in the EA. Chapter 3 describes the existing conditions of various environmental resources in the areas of the Proposed Action and Chapter 4 describes how those resources would be affected by implementation of the Proposed Action and the No-Action alternative. Chapter 5 addresses the cumulative effects of other past, present, and reasonably foreseeable actions that may be implemented in the area of the Proposed Action. Appendices include photographs of the affected buildings and a Draft Programmatic Agreement.

1.2 PROJECT LOCATION

LaRC is situated near the southern end of the lower Virginia Peninsula, approximately 241 kilometers (km) (150 miles) south of Washington, D.C. and 80 km (50 miles) southeast of Richmond, Virginia. LaRC is located within close proximity to several surface water bodies within the tidal zone of the Chesapeake Bay. The cities of Hampton, Poquoson, Newport News, and York County form a major metropolitan statistical area around LaRC. The Center is comprised of research facilities located in two areas which are approximately 4.8 km (3 miles) apart. The two areas, commonly called the West Area and the East Area, are divided by the runways of Langley Air Force Base (LAFB), the headquarters of the Air Combat Command. The East Area is located on 8 hectares (20 acres) of land leased by NASA from LAFB. This area is the original 1917 portion of LaRC and contains several wind tunnels, research facilities, and administrative offices. The West Area occupies 318 hectares (788 acres) of land and contains the major portion of LaRC with the majority of the facilities located there. Figure 1.1 shows LaRC's regional location and relation to LAFB.

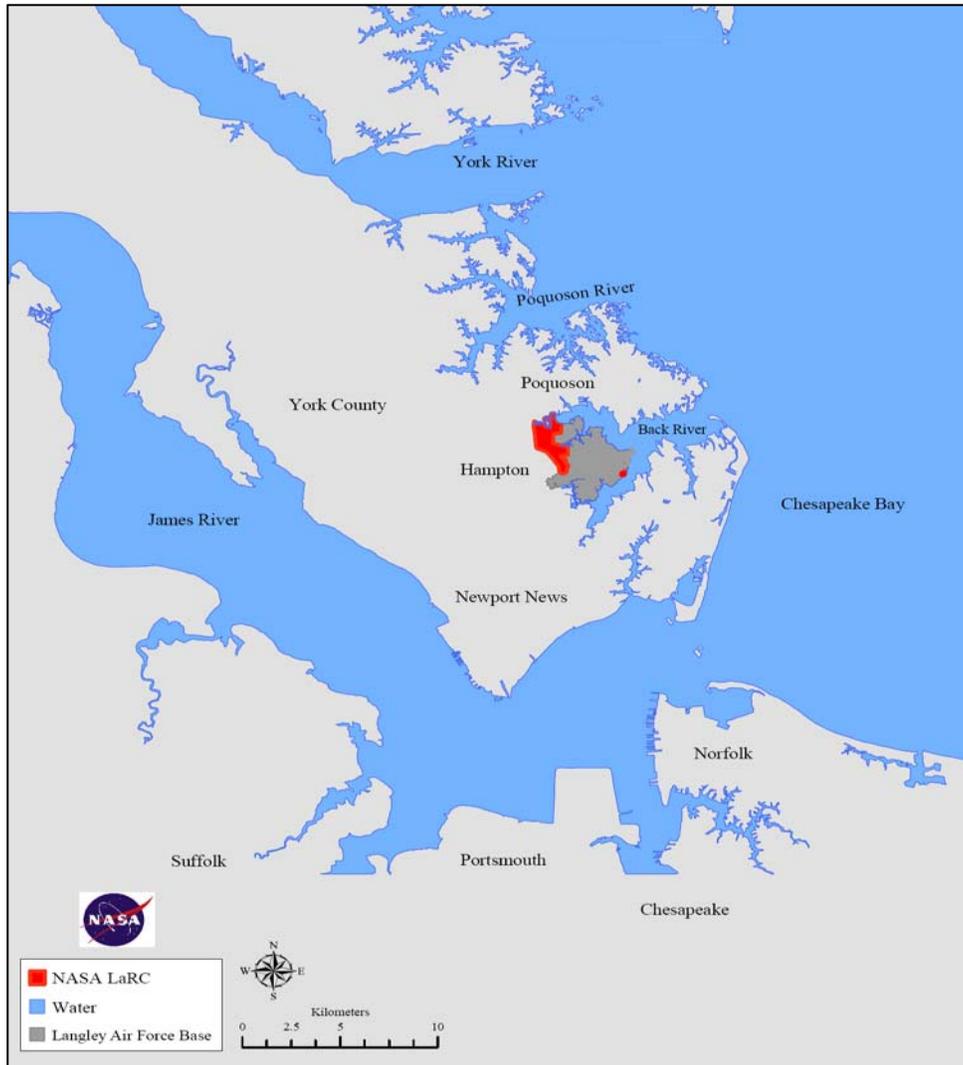


Figure 1.1 – Location of NASA Langley Research Center

1.3 BACKGROUND

In 1917, the War Department purchased land in what is now Hampton, Virginia, for joint use by the Army and the National Advisory Committee for Aeronautics (NACA), the forerunner organization for NASA. The site was designated the Langley Field after Professor Samuel Pierpont Langley, an early pioneer in flight. Congress had created NACA to “supervise and direct the scientific study of the problems of flight” and the Langley Field served as an experimental airfield and proving ground for aircraft. The facility was renamed Langley Memorial Aeronautical Laboratory in 1920 with the dedication of the first wind tunnel. As the organization grew, NACA concentrated mainly on laboratory studies at Langley, gradually shifting from aerodynamic research to military rocketry. As the Cold War brought an increasing

priority to missile development, major NACA contributions to the military missile programs came in the mid 1950's.

In 1958, as a result of the escalating space race, President Eisenhower signed the National Aeronautics and Space Act establishing the National Aeronautics and Space Administration (NASA). NASA absorbed the NACA intact: its 8,000 employees, an annual budget of \$100 million, the Langley, Ames and Lewis laboratories and two smaller test facilities. Langley Laboratory, which was then officially designated Langley Research Center, was the largest of the new agency's field centers, with 3,368 government employees. NASA quickly incorporated other organizations and eventually created ten research and spaceflight centers located around the United States.

Over the years, LaRC has made significant contributions to NASA's mission. Research performed at LaRC in the 1950's and 1960's helped aircraft break the sound barrier and played a major role in helping Americans reach the moon. In the 1970's, research at the Center focused on aircraft design to cut emissions and noise, and on testing space shuttle concepts. In the 1980's, triggered by the Cold War, LaRC and its complex of over 20 wind tunnels performed critical military aircraft research. From the 1980's to the present, LaRC has continued to provide research support and technological advances in aerospace systems concepts and analysis; aerodynamics, aerothermodynamics, and acoustics; structures and materials; airborne systems; and atmospheric sciences. The majority of LaRC's work has been in aeronautics. Once the largest NASA Center, LaRC is now the fifth largest NASA Center.

Agency-wide, NASA continually evaluates its resources and infrastructure in order to align its capabilities to meet the Agency's evolving mission. NASA has recently undertaken a monumental transformation in both business practices and mission. In 2004, President George W. Bush announced a new exploration initiative (Constellation project) to return humans to the moon by 2020 in preparation for human exploration of Mars and beyond. The Constellation project includes the development of the Orion crew exploration vehicle and Ares 1 launch vehicle. LaRC's contribution to the Constellation project will include acting as the lead on the Launch Abort System integration project. The new mission brings not only technical but also financial challenges to the Agency and its field centers, as planners strive to best allocate and utilize limited resources.

1.4 PURPOSE AND NEED FOR THE PROPOSED ACTION

The purpose of proposed deconstruction is to streamline LaRC's infrastructure by removing deteriorating facilities that are no longer operational and/or needed to support NASA's critical mission.

The deconstruction of the 13 buildings is needed to allow LaRC to direct limited funding towards the maintenance and operation of facilities that support the Agency's overall mission, currently and in the future. Funds for general maintenance and operation of facilities at LaRC are provided by the various projects and programs utilizing the facility space. Since the 13 buildings are abandoned or in the process of closing, no direct funding sources exist for their continued maintenance and upkeep.

2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

2.1 PROPOSED ACTION

The Proposed Action consists of the deconstruction of 13 buildings at LaRC during 2008 and 2009. The term “deconstruction” as opposed to demolition, emphasizes the commitment to reuse and recycle building materials, as discussed in Section 4.5.1. The 13 facilities are found in various locations throughout LaRC’s West Area as shown in Figure 2.1 and listed in Table 2-1. Photographs of the facilities are provided in [Appendix A](#).

Table 2-1. Proposed Buildings to Be Deconstructed

Building Number	Building Name	Square Meters	Square Feet	Year Built	Year Closed
1155	Imaging & Photographic Technology	1,356	14,599	1967	2005
1168	Office Facility	906	9,756	1976	2005
1218	Conference Center	305	3,281	1945	2008
1218A	Research Lab	573	6,168	1945	2008
1223A	Welding and Fabrication Shop	128	1,376	1975	2005
1229A	Lab Facility	72	770	1947	2008
1259A	Refrigeration Facility	25	264	1956	2004
1295E	Vacuum Sphere Facility	7	77	1970	2006
1299A	1299 Research Complex	18	192	1965	2004
1299B	1299 Research Complex	18	191	1965	2004
1299C	1299 Research Complex	18	191	1965	2004
1299D	1299 Research Complex	42	450	1965	2004
1299E	1299 Research Complex	27	288	1971	2004

The deconstruction would reduce the Center’s operation and maintenance costs, as well as streamline the infrastructure to better align LaRC’s capabilities with the future direction of NASA missions. The deconstruction of the 13 buildings would result in a reduction of LaRC’s total building inventory of approximately 3,493 square meters (37,603 square feet) and the creation of additional green space at the Center.

With the exception of Building 1223A, all buildings would be removed down to and including slabs and foundations. Utilities would be capped below grade, and the properties would be re-graded to match existing site contours. In the case of Building 1223A, the building would be removed to grade, but no excavation or ground-disturbing activities would occur. (See Section 4.4.)

Deconstruction would be carried out by qualified and properly licensed contractors. All contractors performing work at LaRC are required to comply with applicable safety and health regulations, including Occupational Safety and Health Administration (OSHA) and NASA regulations. Contractors involved in the deconstruction projects would be required to prepare and follow Health and Safety Plans that comply with the regulations to ensure the safety of human health and the environment during the deconstruction. Prior to deconstruction, hazardous items such as asbestos containing materials and lead-based paints would be removed according to LaRC policy and applicable regulations.

Environmental Assessment for Deconstruction of 13 Buildings

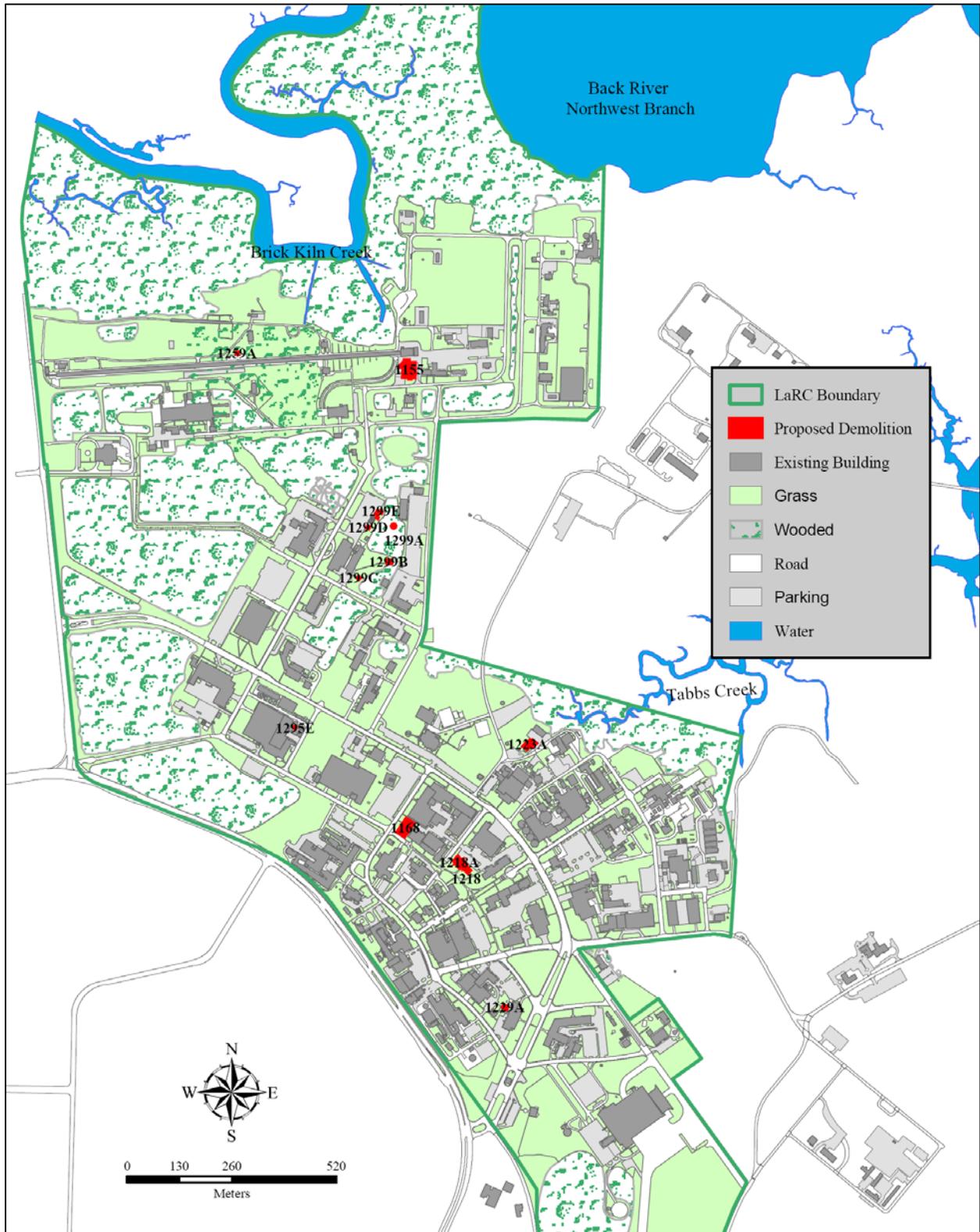


Figure 2.1 – Location of 13 Buildings Proposed for Deconstruction

The debris material resulting from deconstruction would be disposed of according to LaRC's policy for the disposal of construction/demolition debris. LaRC would require that the deconstruction contractor recycle to the maximum extent possible, debris such as concrete and steel. Hazardous or other regulated wastes would be disposed of in accordance with LaRC's established hazardous waste management procedures and following all applicable safety and environmental regulations. All other debris would be removed by the deconstruction contractor and disposed of offsite at a permitted landfill.

2.2 NO-ACTION ALTERNATIVE

Under the No-Action alternative, LaRC would not deconstruct the 13 buildings and they would remain closed and unused. The Center would continue to monitor and maintain the buildings' emergency utilities, but the facilities would continue to deteriorate. The No-Action alternative would forego the opportunity to streamline the Center's infrastructure and to refocus limited resources on the infrastructure that would meet LaRC's mission requirements. Resources would be spent to sustain aging and abandoned infrastructure, which could potentially compromise the Center's mission capabilities.

2.3 ALTERNATIVE ELIMINATED FROM FURTHER CONSIDERATION

One alternative was considered but eliminated from detailed analysis because it would fail to meet the purpose and need of the Proposed Action. The option of leasing the buildings to outside tenants would not allow LaRC to streamline its infrastructure or to remove deteriorating facilities that are no longer needed to support NASA's critical mission. In addition, this alternative is not practical due to security issues and the age and poor condition of the buildings. Most of the buildings are very small with limited utilities and office space, and it is highly unlikely that outside parties would be interested in renting any of the facilities.

3.0 AFFECTED ENVIRONMENT

This chapter describes relevant environmental conditions at LaRC for resources potentially affected by the Proposed Action and the No-Action alternative described in Chapter 2.0. In compliance with guidelines contained in NEPA and the Council on Environmental Quality (CEQ) regulations, and NASA Procedural Requirements (NPR) 8580.1, the description of the existing environment focuses on those environmental resources potentially subject to impacts. The environment includes all areas and lands that might be affected, as well as the natural, cultural, and socioeconomic resources they contain or support.

Resources Eliminated From Detailed Consideration

Several resources were not evaluated in this EA because it was determined unlikely that implementation of either the Proposed Action or the No-Action alternative would have any impacts to these areas of concern. A brief explanation of the reasons why each resource has been eliminated from further consideration in this EA is provided below.

Virginia Coastal Zone Programs. The following Virginia Department of Environmental Quality (DEQ) enforceable programs and policies are not applicable to the Proposed Action because the deconstruction activities would not have any effect on the resources. Additionally, the No-Action alternative would not have any effect on the resources. The programs and policies include:

Fisheries Management. The Proposed Action would have no effect on the conservation and enhancement of finfish and shellfish resources or the promotion of commercial and recreational fisheries.

Subaqueous Lands Management. The Proposed Action would not involve encroachment into, on or over state-owned subaqueous lands.

Dunes Management. There are no sand covered beaches or sand dunes in the vicinity of the Proposed Action.

Shoreline Sanitation. The Proposed Action would have no effect on shoreline sanitation.

Tidal and Nontidal Wetlands Management. The US Army Corps of Engineers (Corps) and the Environmental Protection Agency (EPA) define wetlands as those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. NASA has a 2005 Corps-confirmed delineation of wetlands for LaRC's West Area. Based on LaRC's maps showing the 2005 wetlands delineation, the 13 buildings associated with the Proposed Action are not located in designated wetlands.

Other Virginia Coastal Zone Program areas that are applicable are addressed in Chapters 3 and 4.

Soils and Geology. The deconstruction activities would involve existing structures and previously developed areas. There would be minimal ground disturbance to remove pile caps,

foundations and slab sections during deconstruction and the areas would be backfilled and graded to match existing surroundings. Since implementation of either the Proposed Action or the No-Action alternative would have a negligible effect on soils and geology, these resources were eliminated from further analysis.

Socioeconomic. The No-Action alternative would have no effect on the socioeconomic character of the communities surrounding LaRC. There would be no change in the number of NASA employees as a result of the Proposed Action. The deconstruction work would be performed by contractors from the regional work force. There is a sufficient pool of regional workers to accomplish these tasks in the anticipated timeframe. Because these are temporary jobs that would be filled by the existing work force, there would be no effect on area population or increase in the demand for housing or public services in the region. Therefore, the Proposed Action would have a negligible effect on the socioeconomic character of the surrounding communities and this resource was eliminated from further analysis.

Climate. Climate is the prevalent long-term weather conditions in a particular area. Climatic elements include precipitation, temperature, humidity, sunshine and wind velocity and other natural occurrences such as fog, frost, and hail storms. Implementation of either the Proposed Action or the No-Action alternative would have no measurable effect on the local climate and as such, this resource was eliminated from further analysis.

Environmental Justice. Low-income populations and minority populations that are subject to environmental justice considerations are not located within or near the location of the Proposed Action. Since implementation of either the Proposed Action or the No-Action alternative would not have disproportionately high or adverse human health or environmental effects on low-income populations or minority populations, this resource was eliminated from further analysis.

Wild and Scenic Rivers. None of the waterways within the LaRC property qualify for the provisions of the Wild and Scenic Rivers Act, therefore, analysis of this resource was not carried forward in this EA.

Threatened and Endangered Species. A few threatened and endangered species (mostly birds) were identified at LaRC during a wildlife survey performed in the mid-1990's. Based on the results of this survey, no threatened or endangered species would be expected in the proposed project areas. As such, this resource was eliminated from further analysis.

Transportation. Implementation of the Proposed Action would not change the use of transportation resources in the region. Local highways currently accommodate the traffic generated by LaRC employees and other individuals traveling the roads on a daily basis. Transportation of the deconstruction materials would be along an established haul route leading off the Center. The increase in truck traffic would be minimal because the deconstruction activities would be phased over time. Implementation of the No-Action alternative would not affect transportation resources. Therefore, this resource was eliminated from further analysis.

Since LaRC does not have any *prime or unique farmland*, or *conservation areas*, these resources were also eliminated from further analysis.

3.1 LAND USE

Coastal Zone Management Act

LaRC is located within the coastal zone of the Commonwealth of Virginia. Federal agency activities within the coastal zone must be carried out in a manner that is consistent to the maximum extent practicable with Virginia's applicable enforceable policies. All federal actions are subject to this consistency requirement if they would affect natural resources, land uses, or water uses in the coastal zone. The Virginia DEQ oversees activities in the coastal zone of the State through a number of enforceable programs. In reviewing the Proposed Action, DEQ may require agencies to coordinate with its specific divisions or other agencies for consultation or to obtain permits; they also may comment on environmental impacts and mitigation. Virginia DEQ enforceable programs and policies pertain to Fisheries Management, Subaqueous Lands Management, Tidal and Nontidal Wetlands Management, Dunes Management, Non-Point Source Pollution Control, Point Source Pollution Control, Shoreline Sanitation, Air Pollution Control, and Coastal Lands Management. Not all of these enforceable programs are applicable to the Proposed Action, as explained in Section 3.0. The remaining programs (coastal lands management, air pollution control, non-point source pollution control, and point source pollution control) are discussed in relevant resource sections (e.g., air quality and water resources).

The Coastal Lands Management program establishes authority for the oversight of activities in the Chesapeake Bay Resource Management Areas (RMAs) and Resource Protection Areas (RPAs). RPAs include tidal shores, tidal wetlands, and non-tidal wetlands that are contiguous to and connected by surface flow to tidal wetlands and perennial streams, and a 30-meter (100-foot) buffer located landward of these features. RMAs include floodplains, highly erodible soils, highly permeable soils, steep slopes, and areas 30 meters (100 feet) landward of an RPA. Certain development activities within these zones are restricted in order to protect the quality of state waters. Both RMA and RPA features exist on LaRC property. Building 1155 is in an RMA, but all other buildings proposed for deconstruction are outside the designated RPAs or RMAs.

Functional Zones

Land uses are frequently regulated by management plans, policies, ordinances, and regulations that determine the types of uses that are allowable or protect specially designated or environmentally sensitive areas. LaRC has a current Center Master Plan (CMP) (<http://gis-www.larc.nasa.gov/masterplan/index.html>) that supports the Center's strategic approach to programmatic facility planning and prioritization. The CMP identifies the following functional zones (shown in Figure 3.1):

Administration - The LaRC administrative core, which contains the Center's Headquarters building, is distinguishable by its executive character. No buildings proposed for deconstruction are located in this zone.

Center Operations and Services - Most of the Center's oldest assets and most dense development are included in these areas. This heavy traffic zone either borders or embraces Langley Boulevard, the primary Center traffic artery. These zones include the following facilities affected by the Proposed Action: Buildings 1229A, 1299A, and 1299B.

Environmental Assessment for Deconstruction of 13 Buildings

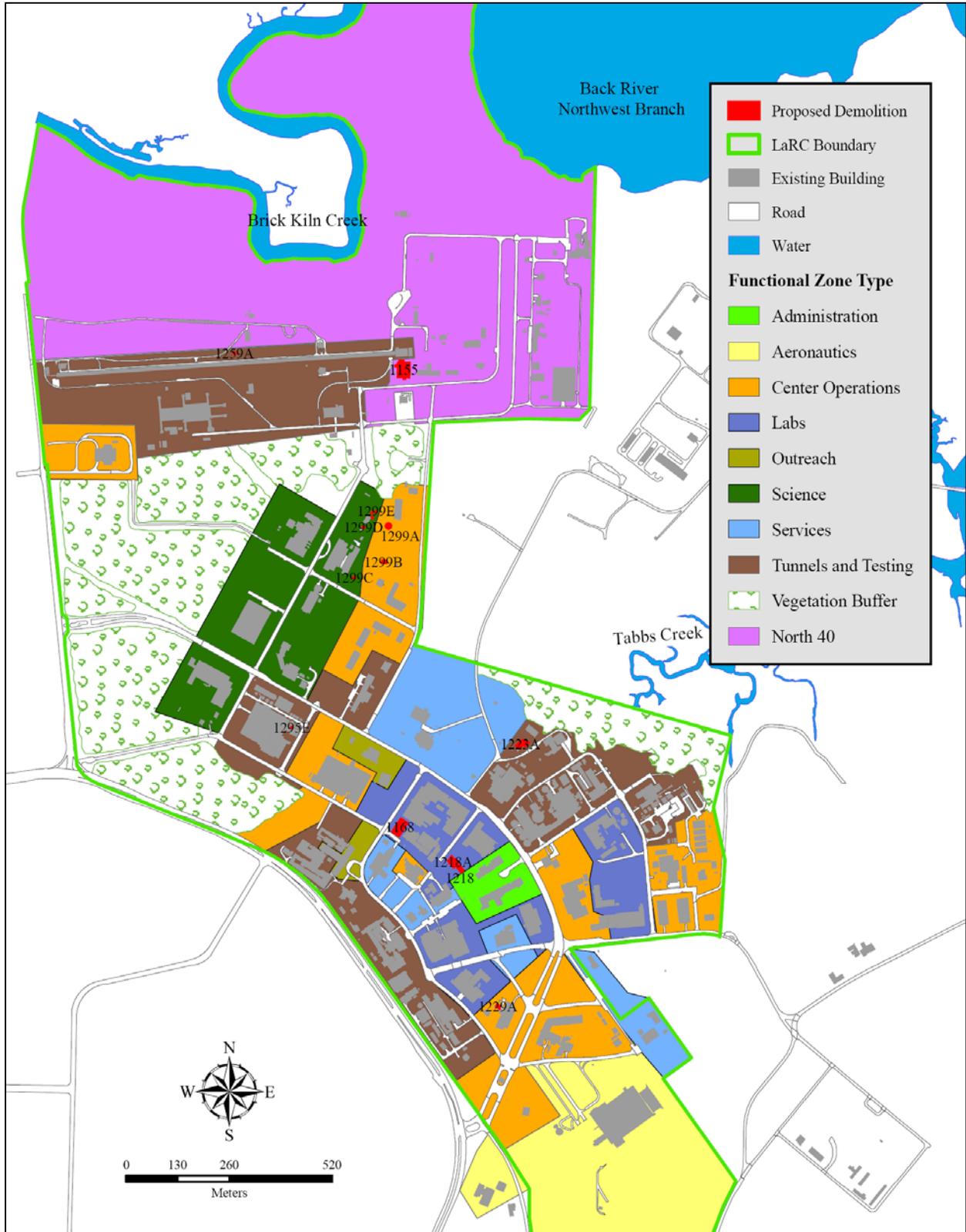


Figure 3.1 – LaRC Functional Zones

Labs and Science - Labs are located in two main areas on either side of Langley Boulevard. Buildings in this zone include 1168, 1218, and 1218A. Science offices are grouped along Dryden Avenue. Buildings 1299C, 1299D, and 1299E are located in this zone.

Tunnels and Testing - LaRC's large-scale tunnels are contained in this zone. These large tunnel complexes along the property boundary form a compact and strongly related functional grouping. The zone is characterized by noisy exhausts, vibration, and the remote, well-regulated potential for uncontrolled energy release. This zone includes Buildings 1223A, 1259A and 1295E.

Aeronautics - This area contains the aircraft hangar and associated site improvements and required open space. Considerable undeveloped land area exists here and is strictly utilized for functions directly connected to the hangar and flight line operations. No buildings proposed for deconstruction are located in this zone.

Outreach - Outreach offices include training facilities, student programs, the offices of public affairs, legislative affairs, news media, and affiliated universities/institutions. No buildings proposed for deconstruction are located in this zone.

Back 40 - This area includes approximately 220 acres of largely undeveloped land. Various small facilities and structures are scattered throughout the area, many of which have been abandoned. This zone includes Building 1155.

Vegetation Buffer - Undeveloped areas are maintained as vegetation buffers along some portions of the LaRC fence line. No buildings proposed for deconstruction are located in this area.

3.2 NOISE

The fighter aircraft operating from LAFB are by far the dominant and most widespread noise source in the area. The Noise Contour Map (Figure 3.2) was derived from the Air Installations Compatible Use Zone report prepared by LAFB. The decibel (dBA) contours on the map are calculated using the "Ldn" parameter, which is preferred by the EPA for assessing environmental noise impacts. It accounts for all the noise occurring throughout the 24-hour day but with a 10-decibel penalty added to the nighttime hours to account for people's greater sensitivity to noise at night. Ldn levels up to 65 dBA are generally considered acceptable for residences. Buildings 1218, 1218A, and 1229A are located in the 70 dBA noise contour zone. Buildings 1168, 1223A, and 1295E are located in the 65 dBA noise zone, while the remaining seven buildings (Buildings 1155, 1259A, 1229A, 1299B, 1299C, 1299D, and 1299E) are outside the LAFB noise contours zones.

Primary noises generated at LaRC itself include the wind tunnels, the compressor stations, and the substations. Most of the wind tunnels are closed-loop tunnels in which the test gas medium is re-circulated and the noise generated by the tunnel is contained largely within the building. The daily operation of motor vehicles in and around LaRC is considered a minor source of noise.

Although Virginia does not have noise control regulations, the City of Hampton has enacted a Noise Ordinance (Hampton City Code, Section 22) which prohibits creating any unreasonably loud or disturbing noise of such character, intensity, or duration that may be detrimental to the life or health of any individual or which disturbs the public peace and welfare. LaRC's

Industrial Hygiene staff monitors noise levels both inside and outside of the Center facilities to ensure excessive noise does not harm human health or the environment. In addition, the Industrial Hygiene staff ensures proper controls are in place to protect Center personnel from exposure to excessive noise levels in accordance with Occupational Safety and Health Administration (OSHA) requirements.

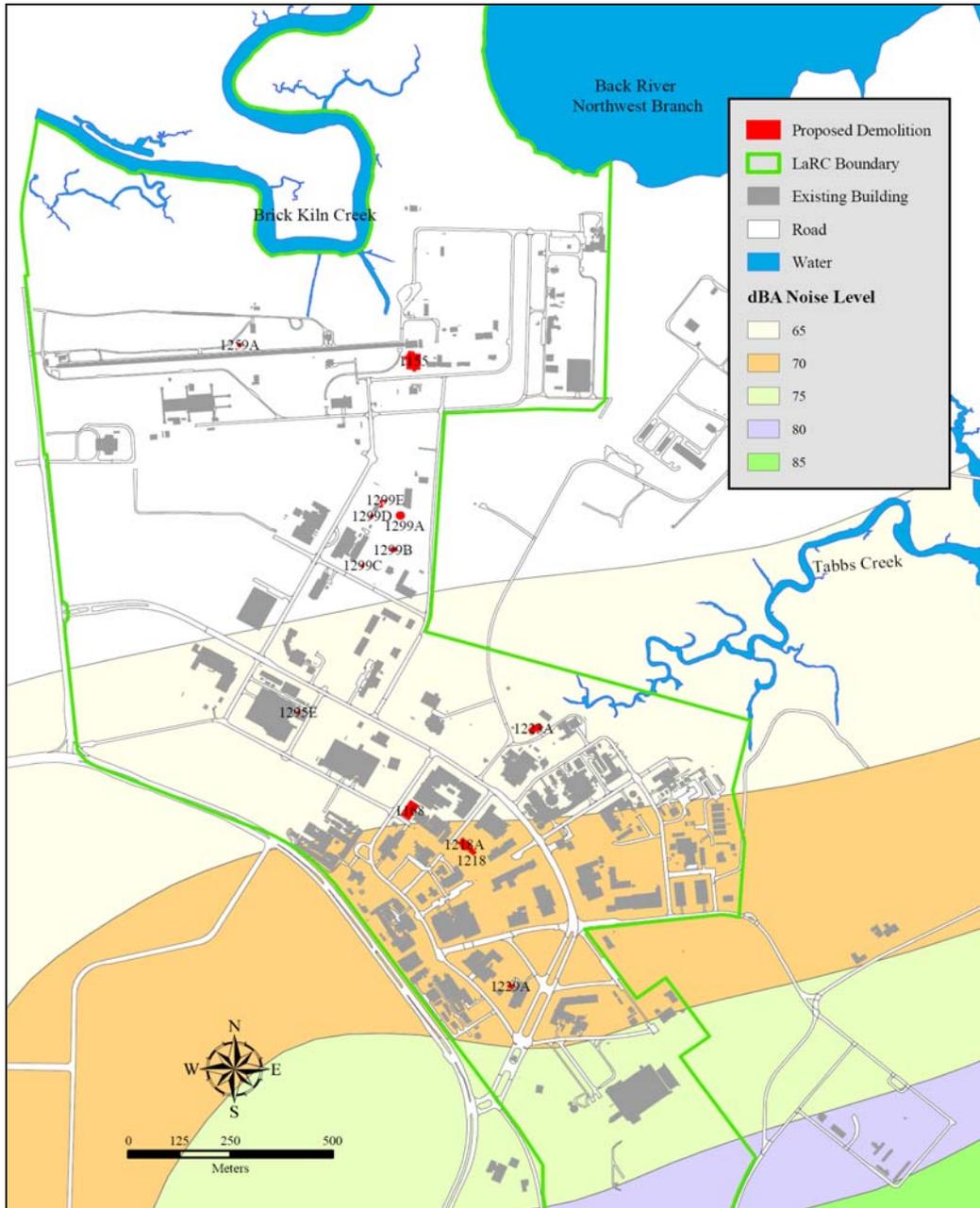


Figure 3.2 – LaRC Noise Contours

3.3 CULTURAL RESOURCES

Cultural resources are any prehistoric or historic district, site, building, structure, or object considered important to a culture, subculture, or community for scientific, traditional, religious or other purposes. They include archaeological resources, traditional resources, and historic architectural resources. Traditional resources are associated with cultural practices and beliefs of a living community that are rooted in its history and are important in maintaining the continuing cultural identity of the community. Archaeological resources are locations where prehistoric or historic activity measurably altered the earth or produced deposits of physical remains (e.g., arrowheads, bottles). Historic architectural resources include standing buildings, dams, canals, bridges, and other structures of historic or aesthetic significance. Historic properties (as defined in 36 CFR 60.4) are significant archaeological, architectural, or traditional resources that are either eligible for listing, or listed in, the National Register of Historic Places (National Register).

The management of cultural resources is primarily regulated by the National Historic Preservation Act (NHPA). Section 106 of the NHPA requires Federal agencies to take into account the effects of their undertakings on historic properties. Impacts to cultural resources may be considered adverse if the resources have been determined to be eligible for listing in the National Register. Section 110 of the NHPA advocates proactive management of resources through the incorporation of historic preservation into the comprehensive plans of agencies, facilities, or programs. The act requires agencies to compile cultural resource inventories which should be integrated into systems for property administration, land use planning and project planning.

The Archaeological Resources Protection Act (ARPA) preserves and protects resources and sites on Federal and Indian lands by prohibiting the removal, sale, receipt, or interstate transportation of archaeological resources obtained illegally (i.e., without permits) from public or Indian lands. ARPA permits are not required for archaeological work conducted by or on behalf of LaRC; however, the specific requirements of ARPA may be addressed in contract documents or other documentation authorizing the work.

For activities on Federal lands, the Native American Graves Protection and Repatriation Act (NAGPRA) requires consultation with “appropriate” Indian tribes or Native Hawaiian organizations prior to the intentional excavation or removal after inadvertent discovery, of several kinds of cultural items. Native American cultural items include human remains, associated funerary objects, unassociated funerary objects, sacred objects, and cultural patrimony. Native American cultural items are the property of Native American groups. For activities on Native American or Native Hawaiian lands, which are defined in the statute, NAGPRA requires the consent of the Indian tribe or Native Hawaiian organization prior to the removal of cultural items. The law also provides for the repatriation of such items from Federal agencies and federally assisted museums and other repositories. Agencies must inventory Native American cultural items, repatriate Native American cultural items, and consult with Native American groups about permits to excavate.

LaRC has a Cultural Resource Management Plan (CRMP) that contains information on LaRC’s historic background, cultural resources and historic properties. It provides information on

cultural resource surveys and investigations that have been performed at the Center and the types of LaRC activities that may affect cultural resources. The CRMP also provides information and guidelines necessary for proper preservation and management of LaRC's cultural resources and historic properties. Although oversight of the cultural resource program at LaRC is primarily the responsibility of LaRC's Historic Preservation Officer (HPO), all persons involved in project planning and implementation at the Center also have a responsibility to be aware of the cultural resource management goals of both NASA and LaRC, and to see that NASA complies with the pertinent historic preservation laws and regulations. Sections of LaRC's CRMP are integrated with the Center's Master Plan and Geographic Information System (GIS) database in order to facilitate project planning and ensure historic preservation issues are addressed in project planning at the Center.

3.3.1 Architectural Resources

LaRC has five properties that are National Historic Landmarks (NHLs): the Variable Density Tunnel, the 8-Foot High Speed Tunnel (Building 641), the Full Scale Tunnel (Building 643), the Rendezvous Docking Simulator, and the Lunar Lander Facility (Building 1297). These properties were identified during a 1985 survey performed by the National Park Service as part of the "Man in Space" theme study. The wind tunnels provided the technological base from which the early space program was initiated, and the training facilities played an important role in preparing astronauts to operate in space and land on the moon.

LaRC recently completed a center-wide reconnaissance level survey of 164 architectural resources. The survey identified that most of LaRC's architectural resources are not individually eligible for the National Register. Many are, however, potentially eligible as contributing resources to a proposed LaRC Historic District. The proposed district is discontinuous, consisting of four defined areas separated by non-significant areas. Two areas are located in LaRC's West Area, and two are located in LaRC's East Area.

Eight of the 13 buildings proposed for deconstruction are located within the proposed historic district. Figure 3.3 shows the location of the buildings in relation to the historic district boundaries. Only the 1299 Research Complex buildings (Building 1299A, 1299B, 1299C, 1299D, and 1299E) are outside the proposed historic district boundaries. Table 3-1 below provides the National Register eligibility for each facility that would be affected by the Proposed Action.

Table 3-1 Architectural Resources Affected by Proposed Deconstruction

Building Number	Name of Building	Year Built	National Register Eligibility*
1155	Imaging & Photographic Technology	1967	Noncontributing
1168	Office Facility	1976	Noncontributing
1218	Conference Center	1945	Contributing
1218A	Research Lab	1945	Contributing
1223A	Welding and Fabrication Shop	1975	Noncontributing
1229A	Lab Facility	1947	Contributing
1259A	Refrigeration Facility	1956	Contributing
1295E	Vacuum Sphere Facility	1970	Not Surveyed
1299A	1299 Research Complex	1965	Noncontributing
1299B	1299 Research Complex	1965	Noncontributing
1299C	1299 Research Complex	1965	Noncontributing
1299D	1299 Research Complex	1965	Not Surveyed
1299E	1299 Research Complex	1971	Not Surveyed
<p>*National Register Eligibility</p> <p><i>Contributing</i> – identified as potentially eligible for listing in the National Register as a contributing resource to the proposed historic district</p> <p><i>Noncontributing</i> – determined to be a non-contributing resource</p> <p><i>Not Surveyed</i> – due to the age, location and type of structure, the facility was not included in the architectural survey, however LaRC has determined that the facility is not an historic property</p>			

Four of the buildings that would be affected by the deconstruction are potentially eligible for listing in the National Register as contributing resources to the proposed historic district.

Environmental Assessment for Deconstruction of 13 Buildings

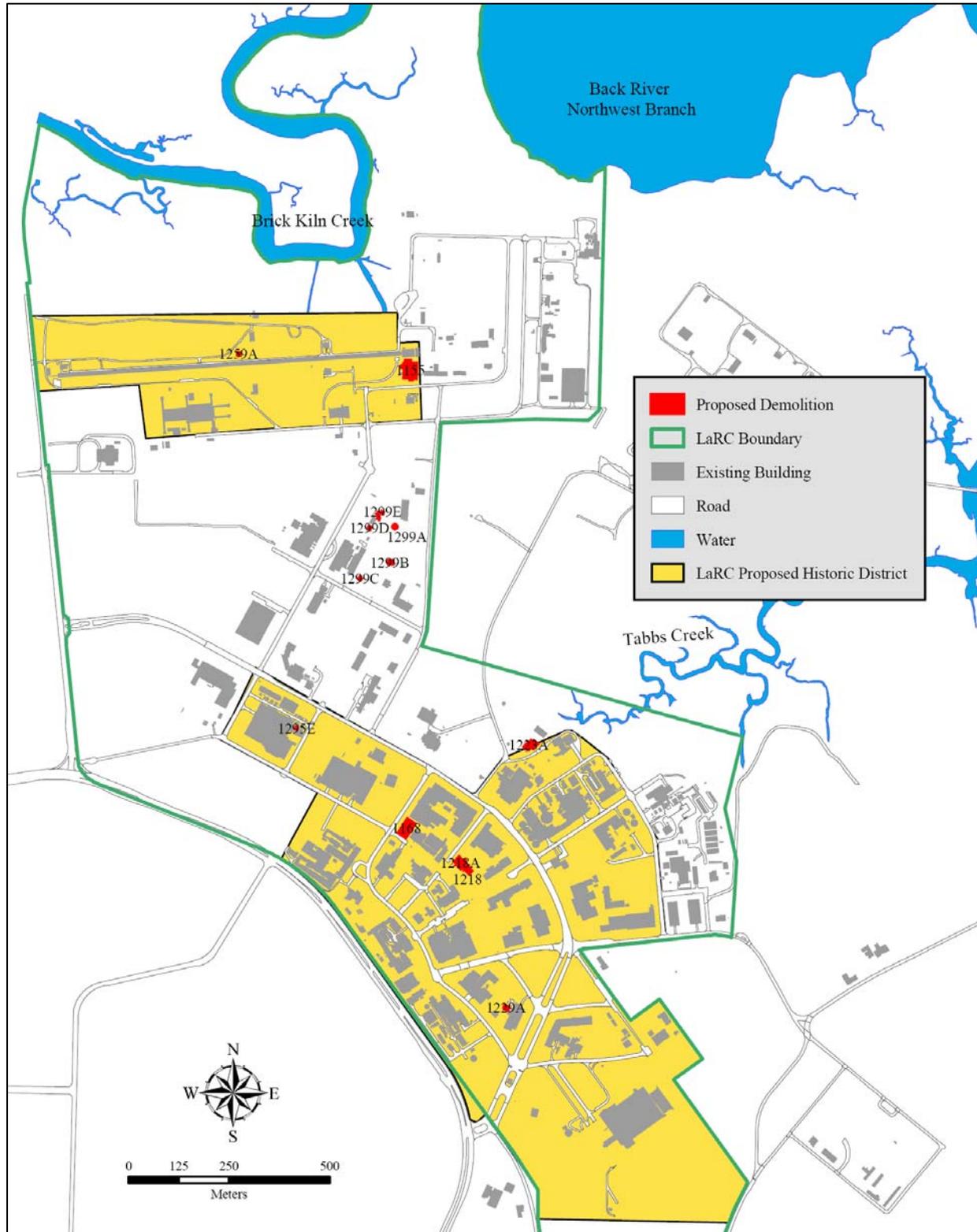


Figure 3.3 – Proposed LaRC West Area Historic District

3.3.2 Archaeological Resources

Since the mid-1970s, LaRC has conducted eleven archaeological surveys, which have identified more than 20 archaeological sites located throughout LaRC. Native American artifacts have been discovered as well as the remains of colonial and early American plantations. One of the sites, Site 44HT1 known as the Chesterville Plantation, is listed in the National Register, as it was the birthplace of George Wythe, an original signer of the Declaration of Independence. The site has been preserved in place in the northern part of the LaRC West Area. At least ten other archaeological sites are potentially eligible for listing in the National Register. These sites would require additional survey work if any future LaRC activity involving ground disturbance were planned at or near any of the sites.

Building 1259A is located at the southern edge of the Chesterville Plantation site. The large “box-like” boundary for the site was established in 1973 when the site was placed in the National Register. The southern edge of the boundary was drawn to follow the linear definition of the Landing Loads Facility Track, a testing complex which was built by LaRC in 1956. Building 1259A is located approximately 50 meters (164 feet) from any positive shovel tests performed in the early 1970’s.

Building 1223A is located approximately 100 meters (328 feet) across a street and small parking lot from a National Register eligible site. Because the area beneath and surrounding Building 1223A experienced significant ground disturbance during facility, road and parking lot construction, archaeological resources are not anticipated. Additionally, shovel tests were performed in 2005 in the area between 1223A and the archaeological site prior to construction of a new sewage pump house, Building 1223B. The shovel tests were negative.

3.3.3 Traditional Resources

Several State-recognized tribes reside in eastern Virginia; however, American Indian traditional resources have not been identified in at LaRC.

3.4 HAZARDOUS, REGULATED AND SOLID WASTE

LaRC has established a pollution prevention policy with the goal of minimizing the volume and toxicity of wastes generated at the Center to the extent technically and economically feasible. Source reduction, recycling, recovery and reuse are utilized whenever possible.

Hazardous wastes generated at LaRC are managed and disposed of according to established Center policies and applicable laws and regulations. LaRC is considered a large quantity generator of hazardous waste. The Center is not authorized to transport hazardous waste off-site, store hazardous waste beyond a 90-day accumulation period, or treat or dispose of hazardous waste on site. The hazardous and regulated wastes generated at LaRC include of a wide variety of items, such as solvents, fuels, oils, gases, batteries, fluorescent light bulbs and laboratory chemicals. Waste generated from remediation projects such as paint removal and spill cleanup are sampled and analyzed to ensure proper waste characterization and disposal. Any materials that contain hazardous waste or exhibit hazardous characteristics are transported by an appropriately permitted contractor to a permitted hazardous waste disposal facility.

LaRC ensures the proper management and disposal of materials containing polychlorinated biphenyls (PCBs). All large transformers at the Center that contained PCBs have been retrofilled or removed. Many of the older facilities at the Center still have small PCB light ballasts or capacitors. LaRC ensures that PCB materials are properly packaged, transported and disposed of at an approved disposal facility. Similar requirements apply for the management of Asbestos Containing Materials (ACM). ACM have been identified in Buildings 1155, 1218, 1218A, 1229A, and 1259A. All contractors performing asbestos work at LaRC must be appropriately licensed, and the waste must be properly packaged, labeled and transported to a permitted landfill.

LaRC has one active remediation site under the Comprehensive Environmental Responsibility Compensation and Liability Act (CERCLA): a Construction Debris Landfill located in the northern part of the Center. No activities associated with the Proposed Action would occur near this remediation site. LaRC is also conducting site investigation work in coordination with the EPA and the Virginia DEQ at the Former Wastewater Treatment site, which is adjacent to Building 1223A.

LaRC maintains an Integrated Spill Contingency Plan that provides information on applicable regulatory requirements and procedures related to oil and hazardous material spill control at LaRC. In addition it documents the policies and procedures regarding the management of underground and aboveground storage tanks. There are no storage tanks located at the buildings proposed for deconstruction.

LaRC generates large volumes of municipal solid waste. The major items are paper, wood, metals, cardboard, plastics, grass and tree clippings, glass, and maintenance wastes. LaRC recycles white and mixed paper, cardboard, toner cartridges, plastic bottles, aluminum cans, scrap metal, used oil, batteries, fluorescent light bulbs, and used tires. Non-hazardous, non-regulated, solid materials that are not collected for recycling are consolidated and transported for disposal to a local landfill or for energy recovery at Hampton's Refuse-Fired Steam Generating Facility.

3.5 POLLUTION PREVENTION

Pollution prevention (P2) is a multimedia approach to environmental management based on the priorities outlined in the Pollution Prevention Act of 1990. When applying P2 methodologies to LaRC activities (e.g. operations generating air emissions, wastewater, or solid/hazardous waste), priority is given to the use of source reduction techniques. Source reduction is the prevention of waste generation through process modifications or material substitutions. Where source reduction is not feasible, other environmentally preferable methods such as reuse or recycling may be appropriate. Remaining wastes are then managed to minimize potential present and future environmental impacts.

LaRC developed a P2 Plan in 1992 and has been implementing a center-wide P2 Program since that date. LaRC's P2 Program is committed to the goals of Executive Order 13423, "Strengthening Federal Environmental, Energy and Transportation Management," which calls for Federal facilities to conduct their environmental activities in a continuously improving,

efficient, and sustainable manner. Executive Order 13423 also dictates goals for Federal Agencies including:

- Vehicles
- Petroleum conservation
- Alternative fuel use
- Energy efficiency
- Greenhouse gases
- Renewable power
- Building performance
- Water conservation
- Procurement
- Toxic materials and chemicals
- Electronics management
- Environmental Management Systems

One of the P2 objectives of LaRC's Environmental Management System is to ensure that debris from facility construction and demolition activities is reused and recycled to the maximum extent practical.

3.6 HEALTH AND SAFETY

LaRC adheres to OSHA and applicable Federal, State and local safety and health regulations. In addition to Federal regulations LaRC also implements its own health and safety regulations many of which are referenced in Langley Policy Directive 1700.1, "Safety Program." This directive sets forth the Center's Safety Policy, which is to provide employees a safe and healthful work environment that is free from hazards that can cause or result in loss of life or injury or damage to equipment and property.

The Center Director is the ranking official charged with the ultimate responsibility for the Center's Safety Program. Implementation of the program is achieved through specific delegation of responsibilities. The LaRC Safety Office is responsible for the day-to-day implementation of LaRC's Safety Program. Each building at the Center is assigned a Facility Safety Head (FSH) and Facility Coordinator (FC) to ensure operations are carried out in accordance with the LaRC's safety requirements. The FSH and FC responsibilities include establishing emergency operation procedures, reviewing and implementing facility operational procedures, and personnel training.

LaRC has been recognized by OSHA as a leader in health and safety by awarding the Center the Star designation level of achievement in the Voluntary Protection Program (VPP). In addition to its VPP and Safety Programs, LaRC has its own fire program and maintains a fire department on site which is centrally located at Building 1248. In the event of an emergency such as fire, explosion, chemical spill or other accident, fire department personnel serve as first responders to initiate actions as necessary to minimize hazards to all personnel and limit damage to property and the environment.

As part of its Safety Program, contractors performing work at LaRC must comply with all applicable safety and health regulations, including OSHA, Agency and Center regulations. Contractors are responsible for providing their own employees with a safe and healthful workplace, and for ensuring their work is performed in a safe manner. Every major on-site contractor must have a designated Safety Officer and site-specific safety and health plan. For off-site contractors performing temporary work at the Center, supervisory personnel must attend a safety briefing provided by the LaRC Safety Office prior to project startup.

3.7 VISUAL RESOURCES

The aesthetic quality of an area or community is composed of visual resources. Physical features that make up the visible landscape include land, water, vegetation and man-made features, such as buildings, roadways and structures. As defined in the Center Master Plan, LaRC's buildings and structures reflect two broad architectural themes: an entirely functional architecture, such as wind tunnels; and institutional architecture, typical of various period architectural styles. Examples of institutional architecture at LaRC include Brick Box, Metal Box, Panel Type, Open Volume, and New Campus. Details of these architectural types, including the buildings proposed for deconstruction that fall into each category, are provided below:

Brick Box architecture (includes Buildings 1168, 1218, 1218A, and 1229A):

- Two or three story red-brick, veneer buildings with window and door openings "punched" into the masonry surfaces.
- Window units usually arranged in a horizontal manner with textured divisions established by masonry patterns.
- Horizontal elements established with stone window sills and parapet copings.
- Window frames generally dark bronze in color.
- Usually flat roof surfaces.

Panel-Type architecture (includes Buildings 1155 and 1223A):

- Flat roof structures.
- Curtain-wall systems between masonry and walls.
- One or two stories high.
- Glass and colored panels within the metal grid.

Open Volume architecture (includes Buildings 1259A and 1295E):

- Ridged roof structures.
- Metal panels or corrugated cement asbestos panels used for exterior walls and roof.
- Variable exterior colors: aluminum, blue, yellow, gray.

New Campus architecture (includes Buildings 1299A, 1299B, and 1299C):

- Buff-brick exterior walls.
- Bronze color window frames.
- Exposed concrete structural systems.
- Pre-cast concrete facing material.
- Articulated structural elements.
- One to two-story office wings. Two to four-story support/test areas.

Fluid Structures architecture (includes Buildings 1299D and 1299E):

- Spherical and cylindrical building forms.
- Exposed structural elements.
- Silver or white color.
- Large scale elements which become dominant focal points throughout the Center.
- Functional elements clearly articulated.

Metal Box architecture (no buildings proposed for deconstruction are of this type):

- Flat roof structures.
- Aluminum panels used as exterior skins.
- Generally used in conjunction with "brick-box" or "panel-type" buildings.

3.8 AIR QUALITY

LaRC is located within the Hampton Roads Intrastate Air Quality Control Region (AQCR). The Hampton Roads AQCR includes four counties (Isle of Wight, James City, Southampton, and York) as well as ten cities (Chesapeake, Franklin, Hampton, Newport News, Norfolk, Poquoson, Portsmouth, Suffolk, Virginia Beach, and Williamsburg). Air quality in the Hampton Roads AQCR is currently designated as attainment for all criteria pollutants (EPA indicators of air quality) except ozone. The Hampton Roads AQCR is an ozone maintenance area.

The Virginia DEQ administers the state's air Operating Permit Program. LaRC has a State Operating permit that establishes emission limits for specific stationary air pollution sources as well as Center-wide emission limits. The Center is not required to have a Title V Federal Operating Permit. LaRC qualifies as a synthetic minor because its air emissions are limited below the prescribed thresholds by its air permit. The Center's air permit contains enforceable conditions that limit the amount of air pollutants that LaRC may emit. Specific permit requirements vary according to the air pollution source, but they generally include physical, operational, record keeping and reporting requirements.

3.9 WATER RESOURCES

Surface Waters

LaRC is located on the coastal basin of the Back River, which flows into the Chesapeake Bay. Approximately forty percent of the LaRC West Area drains into the Brick Kiln Creek, which runs along the northern boundary of LaRC and joins the Back River Northwest Branch. Tabbs Creek, which drains most of the rest of the West Area, also flows north into the Back River Northwest Branch. A small portion of the West Area in the south drains to Tides Mill Creek, which joins the Back River Southwest Branch. The entire LaRC East Area drains to the Back River. An upstream segment of Brick Kiln Creek, all of Tabbs Creek, and the Back River are listed as impaired waters by the EPA. All local waterways are influenced by tides in the Chesapeake Bay.

LaRC operates under three water discharge permits. A permit from the Hampton Roads Sanitation District (HRSD) allows LaRC to discharge non-hazardous industrial wastewater and sanitary sewage to the HRSD sanitary sewer system. The Center has two water permits under the Virginia Pollutant Discharge Elimination System (VPDES), which regulate industrial process wastewater and storm water discharges from the Center. LaRC has ten permitted outfalls in the

West Area, and the VPDES permits require periodic sampling and monitoring of the effluent from the outfalls to ensure compliance with permit limits. Figure 3.4 shows the locations of LaRC's permitted outfalls in relation to the proposed deconstruction activities. The buildings proposed for deconstruction are located throughout the Center and drain to outfalls 3, 5, 7, 8, 9, and 12.

In accordance with Virginia's Department of Conservation and Recreation (DCR), construction activities at LaRC that disturb equal to or greater than 4047 square meters (one acre) require coverage under the General Permit for Discharges of Stormwater From Construction Activities. Additionally, since LaRC is within a Chesapeake Bay Preservation locality, construction activities any larger than 232 square meters (2,500 square feet) also require coverage.

LaRC has few water pollution sources due to the relatively low level of industrial operations at the Center. The major pollutants are the chemicals used to treat the boilers and cooling towers, and these are discharged in accordance with LaRC's permits. LaRC employs various Best Management Practices to prevent or mitigate storm water and/or sewer system pollution from facility activities.

Floodplains

Floodplains are the flood-prone, lowland areas adjoining inland and coastal water including areas of offshore islands. The 100-year floodplain area is considered the area where there is a one percent chance of flooding in any given year. Due to its proximity to the Chesapeake Bay and Back River, approximately one-third of the West Area of LaRC is within the 100-year floodplain. The stillwater elevation for the 100-year floodplain for LaRC is estimated by the Federal Emergency Management Agency (FEMA) to be 2.6 meters (8.5 feet) above mean sea level (MSL). FEMA has estimated 100-year floodwater levels with accompanying waves at about 3.3 meters (11 feet) above MSL near the Center. Building 1155 is located within this floodplain. The stillwater level for the 500-year floodplain is 2.9 meters (9.8 feet) above MSL. Two buildings, 1223A and 1259A, are located within the 500-year floodplain. Figure 3.5 shows the extent of the floodplains on LaRC and the location of the 13 facilities.

Environmental Assessment for Deconstruction of 13 Buildings

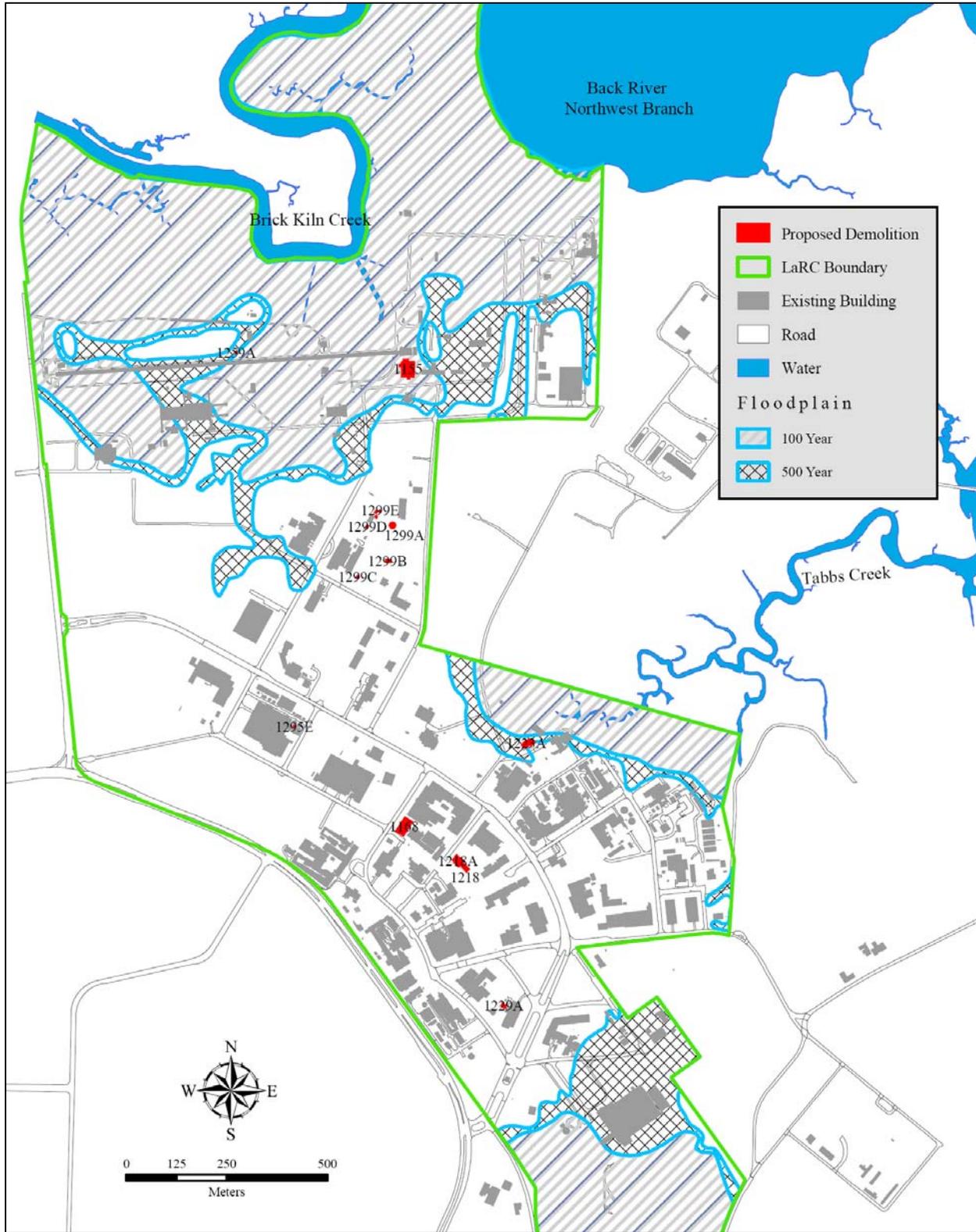


Figure 3.5 – LARC Floodplains

3.10 WILDLIFE RESOURCES

LaRC's West Area supports several wildlife species with its unimproved lands providing habitat for fur-bearing (game) mammals, small mammals, birds, reptiles, amphibians, and fish. Tall fencing surrounding the West Area property limits movement of many larger animals on and off the property from adjacent unimproved lands. Some species that would be expected in this area include common rodents, such as house mouse or white-footed mouse; birds such as American robin, blue jay, fish crow, and common grackle, and reptiles such as eastern box turtle. LaRC's West Area also attracts some white-tailed deer, raccoons, and Virginia opossum that forage from the adjacent woods and wetland areas. The buildings proposed for deconstruction are typically located in a highly developed area that offers limited value to native wildlife. The 1299 Research Complex buildings are located adjacent to a forested area that could support the wildlife species listed above.

3.11 VEGETATION

Significant portions of LaRC contain undeveloped wooded vegetation as well as large areas of maintained grass and landscaping (Figure 2.1). The 1299 Research Complex buildings are adjacent to wooded areas, and Building 1259A is in a maintained grass/ sparsely wooded area. All other facilities are in highly developed areas where nearby vegetation is limited to landscaping plants and trees.

4.0 ENVIRONMENTAL IMPACTS

This chapter describes the potential impacts or effects of both the Proposed Action and the No-Action alternative on the environmental resources described in Chapter 3.

4.1 LAND USE

4.1.1 Proposed Action

Coastal Zone Management

Since LaRC is located within the coastal zone as defined under Virginia DEQ's Coastal Zone Management Program, proposed LaRC activities must be consistent with the enforceable policies regarding coastal resources. As noted in Section 3.1, the following enforceable policies are not applicable to the location of the Proposed Action: Fisheries Management, Subaqueous Lands Management, Dunes Management, Tidal and Nontidal Wetlands Management, and Shoreline Sanitation. The Coastal Lands Management policy is addressed in this section and the remaining Coastal Zone Management Program policies relating to air and water pollution are addressed in Section 4.8 and Section 4.9 respectively. As described in these sections, the Proposed Action would be consistent with the Coastal Zone Management Program's enforceable policies.

The Coastal Lands Management program establishes authority for the oversight of activities in the Chesapeake Bay Resource Management Areas (RMAs) and Resource Protection Areas (RPAs). Certain development activities within these zones are restricted in order to protect the quality of state waters. Both RMA and RPA features exist on LaRC property. Activities associated with the Proposed Action would be consistent with all requirements established for RMAs and RPAs. Building 1155 is in an RMA, but all other buildings proposed for deconstruction are outside the designated RPAs or RMAs.

The deconstruction of Building 1155 would have a positive impact on the RMA in which it is located. The removal of the building would facilitate the infiltration of stormwater into the ground by decreasing impervious surface area. The reintroduction of vegetation into the area would also provide a natural buffer area around the nearby water resource.

Functional Zones

The deconstruction of the 13 buildings would involve localized changes from developed industrial use to open space. The Proposed Action would not affect the current functional zones. The building removal would have an environmental benefit because there would be an increase of green space resulting from a facility footprint reduction of approximately 3,493 square meters (37,603 square feet).

4.1.2 No-Action

Under the No-Action alternative, LaRC would not deconstruct the 13 buildings, and there would be no change to the current land use or functional zones.

4.2 NOISE

4.2.1 Proposed Action

With the implementation of the Proposed Action, heavy equipment and vehicles would cause temporary increases in noise at the project areas and along traffic corridors. The 13 buildings are located in highly developed areas, and high noise levels generated from aircraft and wind tunnel operations are common. Compared to noise generated by aircraft, noise produced by the deconstruction activities would generally be more impulsive, relatively lower in magnitude, and spread out during the day. As such, implementation of the Proposed Action would have a negligible effect on the noise environment.

4.2.2 No-Action

Under the No-Action alternative, LaRC would not deconstruct the 13 buildings, and there would be no change in noise levels in the area.

4.3 CULTURAL RESOURCES

4.3.1 Architectural Resources

4.3.1.1 Proposed Action

Implementation of the Proposed Action would impact LaRC's cultural resources as four of the facilities are potentially eligible for listing in the National Register as contributing resources to a proposed historic district. In accordance with Section 106 of the NHPA, LaRC would minimize the impact by completing mitigation measures as prescribed in agreement documents developed in consultation with the Virginia State Historic Preservation Officer (SHPO). A Memorandum of Agreement (MOA) was recently executed between LaRC and the SHPO for deconstruction of Buildings 1155, 1168 and 1229A. The MOA confirms that Buildings 1155 and 1168 are not eligible for the National Register and no further consultation or mitigation is required. Since Building 1229A is potentially eligible for the National Register, the mitigation measures in the MOA provide for Data Sharing System (DSS) documentation of the building at the intensive level as described by the Virginia Department of Historic Resources survey guidelines. Mitigation measures for deconstruction of Buildings 1218, 1218A and 1259A will be addressed in a separate Programmatic Agreement currently being developed by LaRC and SHPO. The Draft Programmatic Agreement is included in [Appendix B](#).

4.3.1.2 No-Action

Under the No-Action alternative, LaRC would not deconstruct the 13 buildings, and there would be no change to LaRC's architectural resources.

4.3.2 Archaeological Resources

4.3.2.1 Proposed Action

The buildings proposed for deconstruction are located in highly industrialized areas that have experienced previous ground disturbance, and the discovery of intact archaeological resources would not be anticipated. If archaeological resources exist in these areas, they would be in highly disturbed secondary contexts. Additionally, with the exception of capping utilities and removing slab foundations, deconstruction activities would involve incidental subsurface ground

disturbance. In the event that resources were uncovered during deconstruction, all earthmoving activity would immediately stop and LaRC would notify the SHPO. In addition, LaRC would implement the procedures included in Section 4.6 of the CRMP, “Unanticipated Discovery of Cultural Materials or Human Remains.” As such, implementation of the Proposed Action would not affect archaeological resources.

4.3.2.2 No-Action

Under the No-Action alternative, LaRC would not deconstruct the 13 buildings, and there would be no impact to archaeological resources.

4.3.3 Traditional Resources

4.3.3.1 Proposed Action

There are no traditional resources located at LaRC so the Proposed Action would have no impact on traditional resources.

4.3.3.2 No-Action

There are no traditional resources located at LaRC so the No-Action alternative would have no impact on traditional resources.

4.4 HAZARDOUS, REGULATED AND SOLID WASTE

4.4.1 Proposed Action

All hazardous and regulated waste generated from deconstruction activities would be disposed of in accordance with LaRC’s waste management procedures and applicable Federal, State, and local regulations. In accordance with LaRC’s building closure and demolition policies, the buildings would be thoroughly inspected for hazardous and regulated materials prior to deconstruction. Examples of hazardous and regulated materials that could be encountered include mercury switches, fluorescent light bulbs, oils, chemicals, and lead-based paints. Many of the older facilities at the Center still have small PCB light ballasts or capacitors. LaRC ensures that PCB materials are properly packaged, transported and disposed of at an approved disposal facility. Asbestos is also present in many LaRC buildings. Small amounts of asbestos containing materials have been identified in the Buildings 1155, 1218, 1218A, 1229A, and 1259A. All contractors performing asbestos work at LaRC would be appropriately licensed, and the waste would be properly packaged, labeled and transported to a permitted landfill.

One of the buildings included in the Proposed Action (Building 1223A) is located adjacent to an area undergoing a CERCLA site investigation, the Former Wastewater Treatment site. All activities associated with the deconstruction of Building 1223A would be conducted so as not to impact the CERCLA site. Deconstruction activities would be above grade, and there would be no soil excavation or ground disturbance.

Implementation of the Proposed Action would generate a large volume of solid waste including concrete, structural steel, and miscellaneous building components. As described in 4.5.1, contractors would be directed to recycle materials to the maximum extent possible, thereby reducing the amount of debris disposed in landfills. Non-hazardous, non-regulated, solid

materials that are not collected for recycling would be consolidated and transported for disposal to a local landfill or for energy recovery at Hampton's Refuse-Fired Steam Generating Facility. As such, implementation of the Proposed Action would have a negligible impact on the environment resulting from the generation of hazardous, regulated and solid waste.

4.4.2 No-Action

Under the No-Action alternative, LaRC would not deconstruct the 13 buildings, and there would be no change to the current levels of hazardous, regulated or solid waste generation at the Center.

4.5 POLLUTION PREVENTION

4.5.1 Proposed Action

"Deconstruction" as opposed to demolition, would include the dismantling and extracting of reusable/recyclable materials from buildings prior to the destruction/removal of the facility. The deconstruction of the 13 buildings would be carried out following LaRC's principles of P2, to include source reduction, recycling/reuse, treatment and proper disposal of wastes. Materials extracted from the buildings such as concrete, steel structural elements and other metals would be recycled to the maximum extent possible. Maximizing recycling in order to reduce the quantity of materials disposed in the local landfill is one of LaRC's P2 goals. In addition, contractors would be required to follow applicable Best Management Practices to further reduce pollution. As such, use of P2 practices would ensure that the implementation of the Proposed Action would have minimal impacts on the environment.

4.5.2 No-Action

Under the No-Action alternative, LaRC would not deconstruct the 13 buildings, and there would be no change in the levels of wastes or pollution generated at the Center.

4.6 HEALTH AND SAFETY

4.6.1 Proposed Action

The deconstruction activities performed during the Proposed Action would be carried out by qualified and properly licensed and permitted contractors. Contractors performing work at LaRC are required to comply with all applicable safety and health regulations, including OSHA and NASA regulations. Contractors involved in the project would be required to prepare and follow a site-specific Health and Safety Plan that complies with the regulations to ensure the safety of human health and the environment during the deconstruction activities. Adherence to applicable health and safety procedures would minimize the risk of injury to either the contractors working in the active project areas or the surrounding LaRC personnel. Therefore, the Proposed Action would not result in significant health or safety impacts.

4.6.2 No-Action

Under the No-Action alternative, LaRC would not deconstruct the 13 buildings, and there would be no health or safety impacts.

4.7 VISUAL RESOURCES

4.7.1 Proposed Action

Implementation of the Proposed Action would remove deteriorating, aging and often unsightly infrastructure from LaRC's landscapes and create open space within industrialized areas. The resulting open space would improve LaRC's visual resources as the areas would be graded and seeded following deconstruction. Although visual resources in the immediate project areas would be temporarily degraded during the active deconstruction, the resulting open space would provide enhanced visual quality. Therefore, implementation of the Proposed Action would have a long-term positive impact on visual resources at LaRC.

4.7.2 No-Action

With the No-Action alternative, the exterior of many of the aging facilities would continue to deteriorate, and no new open green space would be created. Eventual degradation would result in a decline in aesthetic value. As such, implementation of the No-Action alternative would result in a minor negative impact to the visual resources at LaRC.

4.8 AIR QUALITY

4.8.1 Proposed Action

The deconstruction activities would result in a slight increase in emissions from vehicle/equipment exhaust and from fugitive dust. These effects would be minor and temporary. In relation to the large number of personal and Government vehicles operating on the Center, the additional emissions resulting from contractor vehicles and from equipment would be negligible. In addition, fugitive dust would be minimized by using control methods outlined in 9 VAC 5-50-60 *et. seq.* of the Virginia Regulations for the Control and Abatement of Air Pollution. These precautions may include the use of water for dust control, covering of open equipment for conveying materials, prompt removal of spilled or tracked dirt from paved streets, and removal of dried sediments resulting from soil erosion.

The Proposed Action would not involve open burning. All deconstruction materials would be removed from the Center for recycling, landfill disposal or for energy recovery at Hampton's Refuse-Fired Steam Generating Facility.

To reduce the potential for asbestos to be released into the air during deconstruction activities, standard asbestos emission control procedures would be followed in accordance with the EPA Asbestos Regulations (40 CFR 61 Subpart M) and LaRC's procedural requirements for handling asbestos. All friable asbestos containing materials would be removed from a facility before any activity begins that would break up or disturb the material.

The Proposed Action would be consistent with the enforceable air management policies of the Coastal Zone Management Act. As such, implementation of the Proposed Action would not result in a significant impact on air quality at LaRC.

4.8.2 No-Action

Under the No-Action alternative, LaRC would not deconstruct the 13 buildings, and there would be no change in LaRC's impact on air quality.

4.9 WATER RESOURCES

4.9.1 Proposed Action

The Proposed Action would result in minimal impact to the water resources of LaRC and the surrounding environment. Soil disturbance during deconstruction activities would produce a minor and temporary increase in suspended solids in the stormwater reaching the outfalls that drain the affected areas (primarily outfalls 3, 5, 7, 8, 9, and 12). In accordance with Virginia's Department of Conservation and Recreation (DCR), construction activities at LaRC that disturb equal to or greater than 4,047 square meters (one acre) require coverage under the General Permit for Discharges of Stormwater From Construction Activities. Additionally, since LaRC is within a Chesapeake Bay Preservation locality, construction activities larger than 232 square meters (2,500 square feet) also require coverage. Silt fences, storm drain inlet and outlet protection, and other appropriate standard construction practices would be implemented in accordance with the erosion and sediment control requirements of Virginia's DCR. Additionally, LaRC would ensure that the contractors obtain the appropriate permits and prepare the required plans in accordance with DCR's construction site stormwater permit requirements. Following completion of the deconstruction, there would be no long-term impact to the quality or quantity of stormwater drainage to the outfalls.

The Virginia Coastal Zone Management Program maintains enforceable policies related to point source and non-point source water pollution. The Proposed Action does not involve point source water pollution, but does have the potential to generate a non-point water pollution source. The Coastal Zone Management Program requires that soil-disturbing projects be designed to reduce soil erosion and to decrease inputs of chemical nutrients and sediments to the State's waters. The contractors would adhere to the standards of LaRC's current VPDES permit (General Permit for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems) that requires LaRC to implement Best Management Practices (BMPs) mitigating stormwater pollution from Center activities. These BMPs include employee training, preventive maintenance, visual inspections, spill prevention and response, sediment and erosion control, good housekeeping, and record keeping and reporting. Since LaRC would implement appropriate BMPs to reduce erosion and pollution, the Proposed Action would be consistent with the Coastal Zone Management Program.

Three of buildings proposed for deconstruction are located in the 100-year or 500-year floodplains. Deconstruction activities would comply with provisions of Executive Order 11988, *Floodplain Management*, and the Chesapeake Bay Preservation Act. Since structures built within the floodplains are at increased risk for loss due to flooding, the removal of these buildings would reduce LaRC's vulnerability to natural disaster. In addition, deconstruction would reduce the hindrance of natural flood flow and entrainment of debris. As such, implementation of the Proposed Action would result in minor impacts to water resources at LaRC.

4.9.2 No-Action

Under the No-Action alternative, LaRC would not deconstruct the 13 buildings, and three of the buildings would remain in the 100-year and 500-year floodplains. They would continue to impede natural flood flow and entrainment of debris. As such, implementation of the No-Action alternative could result in a minor negative impact to the water resources at LaRC.

4.10 WILDLIFE RESOURCES

4.10.1 Proposed Action

Disturbance resulting from the Proposed Action would be limited to the local project sites. The activity and noise generated from equipment and vehicles may temporarily displace wildlife from the immediate vicinity of the project areas. It is expected that the impacts to wildlife caused by the deconstruction activities would be very minor and short-term. Implementation of the Proposed Action would result in long-term positive impact to wildlife as removal of the buildings would result in more open green space on LaRC property.

4.10.2 No-Action

Under the No-Action alternative, LaRC would not deconstruct the 13 buildings, and there would be no change to the current status of LaRC's wildlife resources.

4.11 VEGETATION

4.11.1 Proposed Action

All buildings proposed for deconstruction are located in highly developed areas. The only vegetation that would be impacted by the Proposed Action would be landscaping plants and manicured grass in the project areas, but these landscapes would be replanted following removal of the facilities. There would be a net increase in vegetation at the Center because the Proposed Action would result in a reduced facility footprint of approximately 3,493 square meters (37,603 square feet). These cleared areas would be reseeded or allowed to revert to native vegetation. Therefore the Proposed Action would have a slight positive impact on LaRC's vegetation resources.

4.11.2 No-Action

Under the No-Action alternative, LaRC would not deconstruct the 13 buildings, and there would be no change to LaRC's current vegetation.

5.0 CUMULATIVE EFFECTS

The CEQ regulations require that all Federal agencies include cumulative impacts in their environmental analyses (40 CFR 1508.25(c)). Cumulative impacts are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions" (40 CFR 1508.7). This includes those that may be "individually minor but collectively significant actions taking place over time" (40 CFR 1508.7).

Cumulative effects are most likely to arise when a relationship exists between a proposed action and other actions expected to occur in a similar location or during a similar time period. Actions overlapping with or in close proximity to the proposed action would be expected to have more potential for a relationship than actions that may be geographically separated. Similarly, actions that coincide, even partially, in time would tend to offer a higher potential for cumulative effects. The scope of the cumulative impacts analysis involves both the geographic extent of the effects and the timeframe in which the effects could be expected to occur.

The geographic extent for the environmental resources analyzed in this EA is limited to the local LaRC West Area. The timeframe includes recent past and present actions continuing into the foreseeable future at LaRC. An effort has been made to generally identify actions that are being considered and that are in the planning phase at this time.

5.1 PAST, PRESENT AND REASONABLY FORESEEABLE ACTIONS

As an active research facility, LaRC undergoes continual change in order to align its capabilities with the Agency's overall mission. Like any major research installation, LaRC requires new construction, facility improvements and infrastructure upgrades to ensure the Center's resources are appropriate for carrying out its research. Many of LaRC's recent past, present and foreseeable future actions are related to an overarching NASA objective to streamline the Center's infrastructure and restructure and modernize the Center's facilities. To meet NASA's evolving mission requirements, LaRC continues to pursue projects that transform the Center into a more modern, efficient, and technologically advanced Center. Given the age of LaRC's infrastructure and the changes in NASA's mission, many facilities have outlived their useful life and require extensive renovation or demolition.

Between 2004 and 2006, LaRC demolished fourteen dilapidated and abandoned buildings in order to reduce the Center's unneeded and unused infrastructure. Architectural surveys were performed on the facilities and the surveys determined that none of the buildings were culturally or historically significant. The EA that was prepared for the project determined that minimal environmental impacts would occur as a result of the demolitions and LaRC issued a Finding of No Significant Impact (FONSI).

Earlier in 2008, LaRC began demolishing Building 1212B, the 7x10-Foot High Speed Tunnel. NASA closed the facility in 1994 due to lack of need and because duplicate or superior testing capabilities exist at other NASA facilities. Since Building 1212B was determined eligible for listing in the National Register, LaRC developed a Memorandum of Agreement with the SHPO

to minimize the adverse effect of demolition. In accordance with Section 106 of the National Historic Preservation Act and the mitigation stipulations of the Memorandum of Agreement, LaRC prepared Level 1 Historic American Engineering Record documentation on the facility, and developed a public interpretation website. After Section 106 consultation was complete, LaRC prepared an EA that determined no substantial environmental impacts would occur as a result of the demolition, and a FONSI was issued.

LaRC is planning to demolish four closed wind tunnels between 2009 and 2012. The facilities are Building 640 (the 8-Foot Transonic Pressure Tunnel), Building 641 (the 8-Foot High Speed Tunnel), Building 643 (the Full Scale Tunnel), and Building 1146 (the 16-Foot Transonic Tunnel). The decision to demolish the facilities is based on the determination of no current or future government need to use the tunnels and no viable plans from non-governmental entities (industry, universities, etc.) to operate or adaptively reuse the facilities. The demolitions would reduce NASA's infrastructure and allow LaRC to direct limited resources toward facilities that support NASA's overall mission. The demolitions would result in an adverse effect to LaRC's cultural resources since two of the facilities are National Historic Landmarks (NHLs) and two are eligible for listing in the National Register, both individually and as contributing resources to a proposed historic district. In order to mitigate the loss of the NHLs, NASA fulfilled the consultation and mitigation requirements of the Programmatic Agreement among NASA, the National Conference of SHPOs, and the Advisory Council on Historic Preservation, for management of NASA's NHLs. LaRC prepared Historic American Engineering Record documentation; consulted with the Smithsonian Institution regarding salvage of significant artifacts; and developed a website to preserve photographs, film clips, interviews with researchers, and virtual reality tours of the properties. For the two National Register eligible properties, NASA is in the process of developing a Memorandum of Agreement with the SHPO that will contain mitigation measures similar to those in the NHL Programmatic Agreement. A draft EA for demolition of the four wind tunnels was developed and distributed for public comment in March of 2008. LaRC determined that no substantial environmental impacts would occur as a result of the Proposed Action, and a FONSI was issued.

Beginning in 2009 and continuing over the next 15 years, LaRC is proposing to implement a major five-phase modernization and upgrade project called New Town. Site improvements would include construction of five new buildings, the renovation of two existing buildings, and the deconstruction of 22 abandoned and unneeded buildings; as well as upgrades to roadwork, parking lots, and utilities. The project would modernize the center core of LaRC, better align LaRC's capabilities with the future direction of the NASA mission, and significantly reduce the Center's operations and maintenance costs. This initiative would remove aging and inefficient facilities to be replaced by modern offices and research laboratories. The new facilities and modifications to existing facilities would meet the Leadership in Energy and Environmental Design (LEED) silver standards for building design. The New Town project would result in an adverse effect to LaRC's cultural resources since eight of the affected buildings are potentially eligible for listing in the National Register of Historic Places as contributing resources to a proposed historic district, and one of the eight is also potentially eligible as an individual resource. However, LaRC plans to minimize the impact by completing mitigation measures documented in a Programmatic Agreement being developed by NASA and the Virginia SHPO. LaRC is currently preparing an EA to evaluate the environmental impacts of the New Town

project and to afford the public an opportunity to comment on the undertaking. It is anticipated that no substantial environmental impacts would occur as a result of the Proposed Action and a FONSI will be issued.

LaRC anticipates removing additional unneeded and abandoned buildings over the next 10-15 years in the ongoing effort to streamline the Center's infrastructure and minimize operation and maintenance costs. Prior to the deconstruction of additional facilities LaRC would prepare the appropriate documentation as required by NEPA and the NHPA.

As described in Section 1.3 the Agency's evolving mission, especially the Constellation Program to return humans to the moon, could affect the activities and operations at the NASA field centers. LaRC's contribution to the Constellation project including acting as the lead on the Launch Abort System integration project requires the introduction of various new research and development activities at the Center. NASA performed an agency-wide Programmatic Environmental Impact Statement to document the effects of the project at each NASA field Center. The current and reasonably foreseeable activities that would occur at LaRC in support of Constellation would be similar to ongoing research activities conducted in support of existing programs.

5.2 ANALYSIS OF CUMULATIVE IMPACTS

The following analysis examines the impacts on the environment that could result from the incremental impact of the Proposed Action when added to the actions described above. The analysis examines whether such a relationship would result in potentially significant impacts not identified when the Proposed Action is considered alone.

With the exception of cultural resources, LaRC has determined that the projected effect of the Proposed Action, coupled with the other past, current and future actions described above, would result in minimal cumulative impacts to the resources analyzed in this EA.

LaRC has determined that the projected cumulative effect of the Proposed Action, coupled with the other past, current and future actions occurring at LaRC would be the potential loss of LaRC's historic properties. The impacts would be caused by the destruction of potentially historic properties and the potential change in the character or integrity of LaRC's proposed historic district. In accordance with Section 106 of the National Historic Preservation Act, LaRC plans to minimize the impacts to historic properties through performing consultation with the SHPO and carrying out appropriate mitigation measures to preserve LaRC's history and legacy to the maximum extent practical. While the resources once demolished would be lost, the history of the facilities would be preserved through mitigation measures, as described in Section 4.3.1.1.

6.0 REFERENCES

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7.0 LARC PREPARERS AND CONTRIBUTORS

The LaRC Environmental and Logistics Branch prepared this EA. Individuals listed below contributed to the completion of the document by writing portions of the text, contributing background and supporting information, or providing technical review/comment on the draft.

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APPENDIX A

Photographs of 13 Buildings Proposed for Deconstruction

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Building 1155 - Imaging & Photographic Technology



Building 1168 – Office Facility



Building 1218 – Conference Center



Building 1218A – Research Lab

Environmental Assessment for Deconstruction of 13 Buildings



Building 1223A – Welding and Fabrication Shop



Building 1229A – Lab Facility



Building 1259A – Refrigeration Facility



Building 1295E – Vacuum Sphere Facility



Building 1299A – 1299 Research Complex



Building 1299B – 1299 Research Complex



Building 1299C – 1299 Research Complex



Building 1299D – 1299 Research Complex



Building 1299E – 1299 Research Complex

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APPENDIX B

DRAFT PROGRAMMATIC AGREEMENT

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**PROGRAMMATIC AGREEMENT
AMONG
THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION,
THE VIRGINIA STATE HISTORIC PRESERVATION OFFICER, AND
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION
FOR
MANAGEMENT OF FACILITIES, INFRASTRUCTURE, AND SITES AT THE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION'S LANGLEY
RESEARCH CENTER, HAMPTON, VIRGINIA**

WHEREAS, The National Aeronautics and Space Administration Langley Research Center, Hampton, Virginia (NASA LaRC) manages and operates facilities, infrastructure, and sites at NASA LaRC, some of which are considered historic properties within the meaning of the National Historic Preservation Act (NHPA) of 1966, as amended;

WHEREAS, NASA LaRC conducts undertakings and routine maintenance activities that have similar, repetitive, or no effects on historic properties;

WHEREAS, NASA LaRC conducts facility and infrastructure upgrades and replacement the effects of which on historic properties cannot be fully determined prior to the approval of the undertaking;

WHEREAS, facility and infrastructure upgrades and replacement have the potential to affect properties listed and eligible for listing in the National Register of Historic Places (NRHP);

WHEREAS, NASA's overall Cultural Resource Management (CRM) Program is managed by the agency's Federal Preservation Officer (FPO), Environmental Management Division, NASA Headquarters who has designated a Historic Preservation Officer (HPO) at each NASA field Center who is responsible for implementing NASA's CRM program, reporting to the FPO and coordinating cultural resource activities at his/her facility;

WHEREAS, NASA LaRC's HPO is responsible for coordinating the internal review of projects and activities that may affect cultural resources and for consulting with external agencies regarding the identification, evaluation and treatment of NASA LaRC's cultural resources (including but not limited to the Virginia Department of Historic Resources, the Advisory Council on Historic Preservation, and the National Park Service);

WHEREAS, The NASA LaRC HPO is responsible for ensuring that the NASA LaRC Director and senior management are included, as appropriate, in project planning and decision-making regarding NASA LaRC's cultural resources;

WHEREAS, NASA LaRC has completed a Phase I reconnaissance survey of buildings and structures 45 years of age or older titled *Phase I Reconnaissance Survey of Architectural Resources at the National Aeronautics and Space Administration, Langley Research Center*;

WHEREAS, Appendix A to this Programmatic Agreement (Agreement) lists all buildings and structures surveyed at NASA LaRC and the Virginia State Historic Preservation Officer's (VASHPO) opinion, under the heading "Criteria," regarding their potential eligibility for listing in the NRHP (Inventory);

WHEREAS, NASA LaRC has completed Phase I identification and Phase II evaluation surveys for archaeological resources of the facility and has provided the results of these surveys to the VASHPO for review and comment in accordance with its responsibilities under Section 110 of the NHPA, as amended;

WHEREAS, Appendix B to this Agreement lists all previously identified archaeological resources at NASA LaRC and the VASHPO's opinion regarding their potential eligibility for listing in the NRHP;

WHEREAS, Treatment of National Historic Landmark properties located at NASA LaRC will be carried out in accordance with the provisions of the nationwide programmatic agreement among the National Aeronautics and Space Administration, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers dated September 20, 1989;

WHEREAS, The Virginia Air & Space Center (VASC), located in Hampton Virginia, serves as NASA LaRC's official Visitor's Center and through a cooperative agreement, NASA LaRC and VASC work together to promote the rich history and mission of NASA through a variety of interpretive media and programs;

WHEREAS, NASA LaRC has determined that the management and operation of facilities, infrastructure, and sites and associated maintenance and rehabilitation programs may affect buildings, structures, and sites potentially eligible for listing in the NRHP and has consulted with the VASHPO and the Advisory Council on Historic Preservation (ACHP) pursuant to 36 CFR § 800.6 of the ACHP's regulations (*Protection of Historic Properties*, 36 CFR Part 800) implementing Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. 470f);

NOW THEREFORE, NASA LaRC, the VASHPO, and the ACHP agree that the management and operation of facilities, infrastructure, and sites and all associated maintenance and rehabilitation programs shall be undertaken in accordance with the following stipulations to satisfy NASA LaRC's Section 106 responsibilities for all individual undertakings.

STIPULATIONS

NASA LaRC will comply with the following stipulations:

I. RESOURCE IDENTIFICATION AND EVALUATION

A. Within two (2) years of the execution of this Agreement, NASA LaRC will complete a comprehensive reconnaissance level architectural survey for all resources located at NASA LaRC that are 30 years of age or older at the time of the survey and not previously surveyed. The survey shall be sufficient to determine the potential NRHP eligibility of the surveyed resources.

1. Upon completion of the draft survey, LaRC will submit two (2) copies of the survey (draft), including updated Data Sharing System (DSS) software records to the VASHPO for review and comment.
2. Within thirty (30) calendar days of receipt of the draft survey, VASHPO will provide NASA LaRC with any related comments. After receipt of any comments from the VASHPO, NASA LaRC will consider VASHPO's comments, revise and finalize the draft survey, and provide two (2) copies of the survey (final), including DSS records, to the VASHPO.
3. Within thirty (30) calendar days of completion of the final survey, NASA LaRC, in consultation with the VASHPO, will update the Inventory of buildings and structures attached to this Agreement as Attachment A and attach it to this Agreement as Attachment A1.

B. NASA LaRC will reevaluate the Inventory (Attachment A1) and its findings, in consultation with the VASHPO, between the ninth (9th) and eleventh (11th) years after the effective date of this Agreement. Updated Inventories shall be included as Attachments A2, A3 and the like as they are completed. The reevaluations shall occur on a ten (10) year cycle for as long as this Agreement shall remain in effect and shall be accepted by NASA LaRC and the VASHPO before they are incorporated into the Inventory included as Attachment A(x) to this Agreement.

II. ACTIVITIES EXEMPT FROM REVIEW

A. The activities identified in Appendix C (Exempted Undertakings) of this Agreement have limited potential to affect historic properties and may be approved by the HPO and executed by NASA LARC without further consultation with the VASHPO or the ACHP.

B. NASA LaRC may propose additions to the list of Exempted Undertakings by doing so in writing to VASHPO. These undertakings will be added as a revised Appendix C upon written concurrence from VASHPO.

III. TREATMENT OF HISTORIC OR CONTRIBUTING PROPERTIES

Individual properties that are determined eligible for, nominated to, or listed in the NRHP, or properties determined to be contributing elements within the NASA LaRC Historic District, or determined potentially eligible for listing in the NRHP as contributing elements to the NASA LaRC Historic District and included in Attachment A to this Agreement, shall be treated as follows:

A. Adaptive Reuse

Where feasible, historic buildings and structures which no longer support NASA's on-going programs may be adaptively reused.

B. Rehabilitation

1. Rehabilitation of historic or contributing properties will be done in accordance with the recommended approaches in the Secretary of the Interior's *Standards for the Treatment of Historic Property* (Secretary's Standards) that are in effect at the time the plans are approved.
2. Pre-project documentation including work write-ups, bid documents, architectural plans and photographs, will be prepared by NASA LaRC staff with the responsibility for the project, and in consultation with the HPO and other qualified consultants.
3. The HPO shall review the rehabilitation plans and upon determination that the project will have no effect or no adverse effect, by virtue of meeting the Secretary's Standards, issue a Letter of Approval. Work may not begin until a Letter of Approval has been issued by the HPO. All work will conform to the approved proposal and to the conditions stated in the Letter of Approval. Rehabilitation accomplished in this manner will have no adverse effect on historic properties and no further compliance with the ACHP's regulations will be necessary with regard to the subject project.
4. The documentation of each project will be retained by the HPO as part of the permanent project files and may be reviewed by the VASHPO upon request, or as part of the annual report.
5. If the HPO concludes that the Secretary's Standards cannot be met, or the proposed treatment of the property is not rehabilitation, or that the contemplated action is likely to have an adverse effect on properties eligible for the NRHP, then prior to taking any action, NASA LaRC will consult with the VASHPO and initiate the procedures set forth in 36 CFR § 800.5.

C. New Construction and Additions

1. New construction within or immediately adjacent to the NASA LaRC Historic District, will be designed to take into account the Secretary's Standards and be responsive to the overall character of the historic district in terms of height, scale, massing, set-backs, color, materials, and detailing. Preliminary plans will be sent to the HPO for review and approval. If the HPO determines that the plans are compatible with the NASA LaRC Historic District, the HPO will issue a Letter of Approval and the project may proceed. If the HPO determines that the plans are likely to be considered incompatible, the HPO will send them to the VASHPO for

review and comment. The VASHPO will provide comments within fifteen (15) calendar days of receipt of plans and if no comments are received, NASA LaRC shall consider the plans to be approved by VASHPO.

2. Additions to historic buildings or structures or contributing buildings or structures within the NASA LaRC Historic District, shall adhere to the Secretary's Standards and be consistent with guidelines in National Park Service Brief #14, "New Exterior Additions to Historic Buildings: Preservation Concerns," or other guidance in effect at the time the plans are reviewed. Plans for such additions shall be reviewed and approved by the HPO to ensure consistency with these guidelines.

D. Handicapped Accessibility

Handicapped accessibility projects undertaken by NASA LaRC to comply with the Americans with Disabilities Act and other local and federal requirements will follow these guidelines:

1. NASA LaRC will explore all alternative methods to provide handicapped accessibility to historic buildings and structures consistent with the Secretary's Standards, the National Park Service's Preservation Brief # 32 "Making Historic Properties Accessible," and the Department of the Interior's report "Access to Historic Buildings for the Disabled: Suggestions for Planning and Implementation," or other guidance in effect at the time the plans are reviewed.
2. To the extent feasible, handicapped accessibility features (e.g. ramps, elevators, etc.) will not be located on primary elevations of historic buildings or structures and will not result in the removal of significant historic or architectural features or materials.
3. Preliminary plans will be sent to the HPO for review and approval. If the HPO determines that the plans will not have an adverse effect on historic property and meet the Secretary's Standards, the HPO will issue a letter of approval and the project may proceed. If the HPO determines that the plans are likely to have an adverse effect on historic property, the HPO will consult with the VASHPO and initiate the procedures set forth in 36 CFR § 800.5.

E. Sale, Transfer, or Lease of Property to a Non-Federal Agency

1. Prior to the sale, transfer or lease of property included in Appendix A, NASA LaRC will develop covenant or easement language to be attached to the deed or lease document.
2. NASA LaRC shall provide a copy of the draft covenant or easement language to the VASHPO for review and comment.

3. Upon receipt of comment from the VASHPO or absent receipt of comments from the VASHPO within fifteen (15) calendar days of VASHPO's receipt, NASA LaRC shall attach the covenant or easement to the deed or lease agreement prior to the sale, transfer, or lease of property.

IV. DEMOLITION

A. Demolition of non-historic or non-contributing properties

NASA LaRC may proceed with demolition of non-historic properties or non-contributing buildings and structures located in the NASA LaRC Historic District and identified in Attachment A to this Agreement, without further review of the VASHPO or ACHP. NASA LaRC shall retain documentation of all such demolitions in its project files

B. Demolition of historic or contributing buildings and structures

1. Prior to the demolition of historic properties not covered under stipulation VIII(D) (emergency actions provisions) of this Agreement, the HPO shall forward the following documentation to the VASHPO:
 - a. location and description of the building or structure;
 - b. reasons for demolition, including documentation of structural damage or obsolescence, deterioration, and an explanation of why rehabilitation or reuse is neither prudent nor feasible;
 - c. recent photographs of each elevation and any significant architectural or structural elements;
 - d. measures taken to solicit public comment;
 - e. a summary of alternatives considered;
 - f. future plans for the property if they have been developed; and
 - g. proposed Standard Mitigation Measures as outlined in Appendix D to this Agreement
2. The VASHPO will review the documentation submitted and within fifteen (15) calendar days of receipt, will either concur or object in writing to the proposed demolition and proposed standard mitigation measures. If the VASHPO concurs that demolition is the only feasible alternative and the standard mitigation measures are acceptable, then NASA LaRC will proceed with the proposed demolition. If the VASHPO objects to the demolition and the proposed standard mitigation measures, then NASA LaRC shall consult with the VASHPO and ACHP in accordance with the procedures set for in 36 CFR § 800.5. If the

VASHPO does not respond within fifteen (15) calendar days of receipt of complete documentation, then NASA LaRC may assume VASHPO concurrence and proceed with the demolition as proposed.

V. ARCHAEOLOGY

A. In the event NASA LaRC plans ground disturbance as part of a rehabilitation, new construction, site improvement, or other project, in an area with a previously identified archaeological resource listed in Appendix B and the resource is potentially eligible for or listed in the NRHP, NASA LaRC will consult with the VASHPO on ways to avoid, minimize, or mitigate potential effects to the identified resource. All work in areas where no resources are identified, may proceed without further consultation with the VASHPO.

B. If NASA LaRC determines that it is not feasible to preserve or avoid the archaeological resources, NASA LaRC will consult with the VASHPO to develop a treatment plan consistent with the Secretary of the Interior's *Standards and Guidelines for Archeology and Historic Preservation* (Federal Register 48:44716-44742, September 29, 1983) and the VSHPO's *Guidelines for Archaeological Investigations in Virginia* (rev. 2003) or similar guidance that is current at the time the plan is reviewed.

C. NASA LaRC will submit the treatment plan to the VASHPO for review and comment. The VASHPO shall review the treatment plan submitted and within fifteen (15) calendar days of receipt either concur or object in writing to the proposed treatment plan. Upon receipt of VDHR's comments, NASA LaRC will revise and implement the treatment plan.

D. If the VASHPO objects to the proposed treatment plan or its manner of implementation, NASA LaRC will request the comments of the ACHP in accordance with 36 CFR § 800.6(b)(1)(v).

VI. REVIEW AND COORDINATION

A. The HPO will make the appropriate staff at NASA LaRC aware of this Agreement and its associated written guidance.

B. NASA LaRC staff with construction project planning responsibility will prepare proposed project plans in consultation with the HPO and in accordance with Section III of this Agreement.

1. The HPO will review the project documentation as required by this Agreement and when appropriate in accordance with the terms of this Agreement issue a Letter of Approval for each undertaking. No work that implicates the requirements of this Agreement may begin until such letter has been issued.
2. If the HPO determines that the project does not meet the Secretary's Standards or will have an adverse effect on historic properties, the HPO shall consult with

VASHPO, and if necessary the ACHP in accordance with 36 CFR § 800.6.

C. Project documentation prepared for VASHPO review under this Agreement shall be submitted to the VASHPO in an electronic format such as a .pdf file. This shall include photographs, maps, text, plans, and other data as required.

D. NASA LaRC shall submit electronic documentation via e-mail from the HPO during regular working hours with an e-mail delivery confirmation receipt requested. Review and comment periods specified in this Agreement shall commence upon confirmation of e-mail receipt.

VII. PUBLIC BENEFIT AND EDUCATION

A. A variety of public interpretation initiatives may be undertaken by NASA LaRC for the purpose of historic preservation. Such initiatives may include, but are not limited to:

1. Web-based products for children and adults featuring historic properties as part of the heritage of the NACA and NASA LaRC. This product will be hosted on NASA LaRC's website for the public to experience;
2. Reports and pamphlets suitable for the general public describing the history of NASA LaRC and its role in aeronautics and space research;
3. Collection and assembling of documents including technical reports, public relations materials, historic photographs, maps, etc;
4. Identification, collection, preservation, and display of significant objects relating to the history of NASA LaRC, including tools, instruments, scale models, etc;
5. Collection of oral histories from long-term NASA LaRC employees, providing information on worker life and social history.

B. In keeping with the National Aeronautics and Space Act of 1958 which charges NASA with the development of public education and outreach programs, NASA LaRC may undertake the following through its cooperative agreement with the Virginia Air and Space Center, as well as other established partnerships:

1. Develop, display and interpret a comprehensive exhibit program for the general public that reflects the rich history and mission of NACA, NASA and the Langley Research Center;
2. Provide public bus tours of NASA LaRC in accordance with the policies and regulations of the Langley Research Center. NASA LaRC will select the facilities that may be visited and make other necessary arrangements for visitors from the VASC or other organizations, to tour portions of NASA LaRC either for special

- group visits or for special drive-through bus tours as arranged by the VASC;
3. Provide an aerospace lecture and tour program for school age students and other groups. This may include, but not be limited to, special evenings and weekend programs, including space camp-ins, astronaut visits, special exhibits, etc.;
 4. Provide permanent displays and changing exhibits of historical and current NASA aerospace artifacts and hardware;
 5. Maintain an Aerospace Library at the VASC for use by teachers, students, distinguished guests, docents, general public and staffs of the VASC and NASA LaRC;
 6. Provide an aerospace Public Education Program to acquaint the general public, students and other special groups with the research and programs of NASA;
 7. Provide an Educator Resource Center that helps educators access and utilize NASA science, mathematics, technology and instructional products and provides educators with in-service and pre-service training and demonstrations of NASA educational technologies;
 8. Arrange for the loan of appropriate and available Smithsonian National Air and Space Museum exhibits and artifacts for display at the VASC.

VIII. ADMINISTRATIVE PROVISIONS

A. Professional Standards and Qualifications

1. All archaeological studies, resulting from this Agreement, including data recovery plan(s), shall be consistent with the Secretary of the Interior's *Standards and Guidelines for Archeological Documentation (48 FR 4434-37)* and the VASHPO's *Guidelines for Conducting Cultural Resource Survey in Virginia: Additional Guidance for the Implementation of the Federal Standards Entitled Archaeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines (48 FR 44742, September 29, 1983) 1999, rev. 2003*, or other similar guidance in effect at the time the plans are reviewed, and shall take into account the ACHP's publications, *Recommended Approach for Consultation on Recovery of Significant Information from Archeological Sites (1999)* and *Section 106 Archaeology Guidance (June 2007)* or other similar guidance in effect at the time the plans are reviewed.
2. All archaeological work carried out pursuant to this Agreement shall be conducted by or under the direct supervision of an individual or individuals who meet, at a minimum, the qualifications for archaeology set forth in the Secretary of Interior's *Professional Qualifications Standards (62 FR 33707, June 20, 1997)*.

3. All historical and architectural studies resulting from the Agreement shall be consistent with pertinent standards and guidelines of the Secretary of the Interior, including as applicable the Secretary of the Interior's *Standards and Guidelines for Historical Documentation* (48 FR 44728-30) and for *Architectural and Engineering Documentation* (48 FR 44730-34).
4. All evaluations of buildings or structures shall be carried out by or under the supervision of an individual or individuals who meet, at a minimum, the qualifications for architectural history set forth in the *Professional Qualifications Standards* and all design work on historic buildings and structures shall be carried out by or under the supervision of an individual or individuals meeting the qualifications for historic architecture set forth in the *Professional Qualifications Standards*.

B. Post Review Discoveries

NASA LaRC shall ensure that for activities involving ground disturbance and/or construction, the following procedures for the treatment of post review discoveries will be followed:

1. In the event that a previously unidentified archaeological resource is discovered during ground disturbing activities, all construction work involving ground disturbance shall be halted in the area of the resource and in any adjacent areas where the resource can reasonably be expected to occur. An archaeologist meeting the Secretary of the Interior's *Professional Qualifications Standards* shall inspect the work site and determine the extent and the nature of the affected archaeological property. Construction work may then proceed in the Project Area outside of the area of discovery.
2. NASA LaRC shall then proceed in accordance with 36 CFR Part 800.13(b)(3).
3. If the resource is determined by NASA LaRC in consultation with the VASHPO to meet the National Register Criteria (36 CFR 60.6), NASA LaRC shall ensure compliance with 36 CFR 800.13.
4. If human remains and associated funerary objects are discovered, NASA LaRC shall immediately halt work in the area and contact the appropriate authorities. If the remains are determined to be Native American, NASA LaRC will comply with the provisions of the Native American Graves Protection and Repatriation Act as appropriate. If the remains are determined not to be Native American, NASA LaRC shall comply with the *Virginia Antiquities Act*, Section 10.1-2305 of the *Code of Virginia*, final regulations adopted by the Virginia Board of Historic Resources and published in the Virginia Register on July 15, 1991.
5. NASA LaRC shall ensure that archaeological artifacts recovered from archaeological investigations or post review discoveries will be stored in a

curatorial repository that meets federal standards stipulated in 36 C.F.R. Part 79, “The Curation of Federally Owned and Administered Archaeological Collections.”

6. NASA LaRC will notify the VASHPO and other parties as appropriate, at the earliest possible time, if an effect to a known historic property occurs in an unanticipated manner. NASA LaRC shall then consult with the VASHPO to develop actions to avoid, minimize, and/or mitigate further effects to the historic property from the proposed activity. After such consultation, NASA LaRC shall notify the VASHPO and other appropriate parties as to its final decision.

C. Dispute Resolution

1. Should any signatory to this Agreement object to any action carried out or proposed by NASA LaRC with respect to implementation of this Agreement, the objecting signatory shall consult with the NASA LaRC HPO to resolve the objection.
2. If after initiating such consultation NASA LaRC determines that the objection cannot be resolved through consultation, NASA LaRC shall forward all documentation relevant to the objection to the ACHP, including the proposed response to the objection.
3. Within forty-five (45) calendar days after receipt of all pertinent documentation, the ACHP shall exercise one of the following options:
 - a. Advise NASA LaRC that the ACHP concurs in the proposed response to the objection, whereupon NASA LaRC shall respond to the objection accordingly;
 - b. Provide NASA LaRC with recommendations, which NASA LaRC shall take into account in reaching a final decision regarding its response to the objections; or
 - c. Notify NASA LaRC that the objection will be referred for ACHP comment pursuant to 36 CFR Part 800.7(c), and proceed to refer the objection for comment. Any ACHP comment rendered pursuant to this stipulation shall be understood to apply only to the subject of the objection; all other responsibilities of the parties stipulated in agreement shall remain unchanged.
4. Should the ACHP not exercise one of the above options within forty-five (45) calendar days after receipt of all pertinent documentation, NASA LaRC may assume the ACHP’s concurrence in its proposed response to the objection and make a final decision on how to respond to the objection.
5. At any time during implementation of the measures stipulated in this Agreement,

should an objection pertaining to this Agreement be raised by a member of the public, the party to this Agreement receiving the objection shall notify the other parties to this Agreement and NASA LaRC will take the objection into account, consulting with the objector and, should the objector so request, with any of the parties to this Agreement to resolve the objection.

6. Except as otherwise provided above, all disputes concerning questions of fact or law arising under this Agreement shall be referred by the claimant in writing to the appropriate VASHPO and ACHP representatives and the NASA LaRC HPO for resolution. The representatives of the Parties shall seek to resolve any dispute by mutual agreement. If the Parties are unable to agree on a resolution, the claimant may submit the dispute in writing to the NASA LaRC Center Director and to the VASHPO's Director of [fill in title] and ACHP's Director of [fill in title], who together shall attempt to resolve the dispute by mutual agreement. If the Parties are unable to resolve the dispute, the NASA LaRC Center Director shall issue a written decision. This written decision shall be a final NASA decision for all purposes prior to seeking judicial review. The Parties agree this Dispute Resolution procedure shall be the exclusive procedure followed by the Parties in resolving any dispute arising under, or based on, an express or implied provision of this Agreement, including an alleged breach.

D. Emergency Actions

1. Emergency actions are those actions deemed necessary by NASA LaRC as an immediate and direct response to an emergency situation, which is a disaster or emergency declared by the President, tribal government, or the Governor of the State, or other immediate threats to life or property. Emergency actions under this Agreement are only those implemented within thirty (30) calendar days from the initiation of the emergency situation.
2. If the emergency action has the potential to affect historic properties, NASA LaRC shall notify the VASHPO and other parties as appropriate prior to undertaking the action, when feasible. As part of the notification, NASA LaRC shall provide a plan to address the emergency. The plan shall include the basis for the proposed action and photographs of the current building, facility, or area under consideration.
3. If NASA LaRC is unable to consult with the VASHPO prior to carrying out emergency actions, NASA LaRC shall notify the VASHPO and other parties as appropriate within five (5) calendar days after the initiation of the emergency action. This notification shall include a description of the emergency action taken, the effects of the action(s) to historic properties, and, where appropriate, any further proposed measures to avoid, minimize, or mitigate potential adverse effects to historic properties. NASA LaRC shall implement the proposed plan.
4. Where possible, such emergency actions shall be undertaken in a manner that does not foreclose future preservation or restoration of historic properties. Where

such emergency actions may affect historic buildings or structures, they shall be undertaken in a manner that is consistent with the Secretary's Standards. In addition, where possible, such actions will be done with on-site monitoring by the appropriate preservation professional who meets, at a minimum, the *Professional Qualifications Standards* in his or her field of expertise.

5. Immediate rescue and salvage operations conducted to preserve life or property are exempt from these and all other provisions of this Agreement.

E. Annual Reporting

NASA LaRC shall provide an annual status report within 12 months of the execution of this Agreement, and every 12 months thereafter, if deemed necessary by the signatories of this Agreement, to the VASHPO to review implementation of the terms of this Agreement and to determine whether amendments are needed. Annual reports shall be prepared by NASA LaRC and submitted to the VASHPO.

F. Amendment and Termination

1. Amendment

Any signatory to the Agreement may request that this Agreement be amended, whereby the signatories shall consult to consider whether such amendment is necessary. Any amendment to this Agreement shall be in writing and shall become effective upon the signature of all the signatories.

2. Termination

Any signatory to the Agreement may terminate this Agreement by providing thirty (30) calendar day's written notice to NASA LaRC and the other signatory parties. During the period after notification and prior to termination, NASA LaRC and the other signatories shall consult to seek agreement on amendments or other actions that would avoid termination. In the event of termination, NASA LaRC shall negotiate a new PA per 36 CFR Part 800.14(b), or request, consider, and respond to ACHP formal comments per 36 CFR Part 800.7.

G. Anti-Deficiency Act

The stipulations of this Agreement are subject to the provisions of the Anti-Deficiency Act. If compliance with the Anti-Deficiency Act alters or impairs NASA LaRC's ability to implement the stipulations of this Agreement, NASA LaRC shall consult in accordance with the amendment and termination procedures found at Stipulations IV(F)(1) and IV(F)(2) of this Agreement. No provision of this Agreement shall be interpreted to require obligation or payment of funds in violation of the Anti-Deficiency Act, Title 31 U.S.C. § 1341.

H. Handling of sensitive but unclassified data

1. In the performance of this Agreement, the non-NASA Parties may have access to, be furnished with, or use U.S. Government data, the use and dissemination of which, the Government intends to control. With respect to data specifically marked with a restrictive notice, including but not limited to "Sensitive But Unclassified, (SBU)", the non-NASA Parties agree to:
 - a. Use, disclose, or reproduce such data only to the extent necessary to perform the work required under this Agreement;
 - b. Safeguard such data from unauthorized use or disclosure.
 - c. Allow access to such data only to its employees, contractors, or subcontractors that require access for their performance under this Agreement;
 - d. Except as provided in 1(c) above, preclude access and disclosure of such data outside the Parties' organizations;
 - e. Notify its employees who may require access to such data about the obligations under this clause and ensure that such employees comply with such obligations, and notify its contractors or subcontractors that may require access to such data about their obligations under this clause; and
 - f. Return or dispose of such data, as NASA may direct, when the data is no longer needed for performance under this Agreement.
2. In the event that data exchanged between NASA and the Parties include a legend that the non-NASA Parties deem to be ambiguous or unauthorized, the non-NASA Parties may inform NASA of such condition. Notwithstanding such a legend, as long as such legend provides an indication that a restriction on use or disclosure was intended, the Party receiving such data shall treat such data pursuant to the requirements of this clause unless otherwise directed, in writing, by NASA.
3. Notwithstanding any restrictions on use, disclosure, or reproduction of data provided in this clause, the Parties will not be restricted in the use, disclosure, and reproduction of any data that: (a) is publicly available at the time of disclosure or becomes publicly available without breach of this Agreement; (b) is known to, in the possession of, or developed by the receiving Party independent of carrying out the receiving Party's responsibilities under this Agreement and independent of any disclosure of, or without reference to, proprietary data or otherwise protectable data hereunder; (c) is received from a third Party having the right to disclose such information without restriction; or (d) is required to be produced by the receiving Party pursuant to a court order or other legal requirement. If a non-NASA Party believes that any of the events or conditions that remove restriction on the use,

disclosure, and reproduction of the data apply, the non-NASA Party will promptly notify NASA of such belief prior to acting on such belief, and, in any event, will notify NASA prior to an unrestricted use, disclosure, or reproduction of such data.

I. Duration and renewal.

The effective date of this Agreement shall be the date of the last signature of the signatories. This Agreement shall remain in full force and effect for twenty (20) years after the date of the last signatory's signature. This Agreement may be extended to remain in effect for up to fifty (50) years in five (5) year increments as follows: Sixty (60) calendar days prior to the date this Agreement would otherwise expire, the NASA LaRC HPO will consult with the signatories for extension of this Agreement for another five years. Upon Agreement for such an extension, the Parties will execute a written modification, based on the template at Appendix E, extending the Agreement for another five years from the date the original Agreement would have expired absent the extension. Twenty-four (24) months prior to the expiration of the Agreement, the signatories will consult and determine whether the Agreement needs to be extended, amended, or terminated and take such actions as appropriate.

Execution and implementation of this Agreement evidences that NASA LaRC has taken into account the effects of the undertaking on historic properties and has afforded the ACHP a reasonable opportunity to comment on the undertaking.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, LANGLEY RESEARCH CENTER

_____ Date: _____
Lesa B. Roe, Director

ADVISORY COUNCIL ON HISTORIC PRESERVATION

_____ Date: _____
John M. Fowler, Executive Director

VIRGINIA STATE HISTORIC PRESERVATION OFFICER

_____ Date: _____
Kathleen S. Kilpatrick, Director

**DRAFT PROGRAMMATIC AGREEMENT
APPENDIX A**

Inventory of NASA LaRC Resources as of June 2008

[Not included]

DRAFT PROGRAMMATIC AGREEMENT
APPENDIX B
Archaeological Resource Inventory and NRHP Determination
As of June 2008

[Not included]

**APPENDIX C:
Actions That Do Not Require Consultation with
VASHPO or ACHP (Exempted Undertakings)**

The following categories of undertakings are considered to have little or no effect to historic properties and do not require consultation with the VASHPO or ACHP to implement provided such undertakings do not alter or detract from the qualities that contribute to the significance of an historic property.

1. **New building construction:** New construction within NASA LaRC's historic district which is potentially eligible for listing in the NRHP provided such new construction does not directly impact contributing resources. *Consultation with the SHPO required when construction proposed on previously undisturbed ground to ensure archaeological properties will not be adversely affected.*
2. **Facility/Equipment removal or replacement:** Removal or replacement of existing non-historic equipment or facility components where the equipment or component itself is not a feature which contributes to the historic significance of the historic property (ies) identified in Appendix A.
3. **Building maintenance and repair:** General maintenance and repair of buildings and facilities. Includes, but is not limited to, painting; siding; roofing; door, ceiling, wall, window, floor covering repair/replacement; elevator repair; filter and light replacement; and repairs to existing HVAC equipment. If historic fabric must be replaced, it should be in-kind and match as practicable the configuration, material, size, detail, and construction of the historic fabric as called for in the Secretary's Standards.
4. **Building removal:** Demolition of buildings, structures, or facilities that are either not historic properties listed in Appendix A, or do not contribute to the significance of an Appendix A historic property, whether or not it lies within LaRC's Historic District.
5. **Retrofitting:** May include placement, installation, maintenance, repair, removal or replacement of communications and computer systems, including public address systems, facsimile systems, microwave/radio systems, fiber-optic cables, and phone systems. *Properties historically significant in the context of communications require prior consultation with the VASHPO should retrofitting affect historically significant fabric.*
6. **Fire detection/suppression:** Changes, modifications, or upgrades to fire detection/suppression systems, fire alarm systems, smoke detectors, and suppression/sprinkler systems in all NASA LaRC buildings and facilities. *Changes that may affect those historic qualities of a property require prior consultation with the VASHPO.*
7. **Lighting:** Changes to interior and exterior lighting systems including replacement of or modification to lighting systems in all NASA LaRC buildings and facilities.

8. **Electrical:** Maintenance, repair, removal, modification, upgrading or replacement of plant and building electrical systems (e.g., building conduit, wiring and lighting, emergency lighting, etc.) in all NASA LaRC buildings and facilities. Upgrading or addition of new electrical lines between or among buildings within LaRC's Historic District.
9. **Water systems:** Changes to water systems including placement, installation, maintenance, repair, removal, and operation of plant water systems including, but not limited to: water wells, cooling water systems, potable water systems, storm sewers, waste water treatment systems, plant drainage, and plumbing. *Replacement of sewers and drains not on original location requires consideration for archaeological resources and may require consultation with VASHPO.*
10. **Energy conservation:** Installation, replacement, or upgrading of HVAC systems, including modifications to the HVAC control systems and conversions to alternative fuels provided that these elements do not affect historic fabric.
11. **Health and safety activities:** Clean-up, encapsulation and removal/disposal of asbestos-containing materials and lead paint from all non-historic buildings and structures. *Buildings and structures listed in Appendix A require prior consultation with the VASHPO should historically significant fabric be targeted.*
12. **Temporary facilities:** Construction or placement of temporary structures and sheds that do not physically affect historically significant properties or involve new ground disturbance.
13. **Parking:** Parking lot maintenance and repair of existing lots. Temporary parking or placement of mobile homes, tents, and portable structures on extant parking lots or other surfaces that do not require new ground disturbance.
14. **Roads:** Routing, road maintenance, and resurfacing where work is confined to previously maintained surfaces, ditches, culverts, and cut and fill slopes where there are no known historic properties or historic properties would not be affected because the proposed work is clearly within a disturbed context. Includes paving extant roads or parking lots, or placing marl or shell on dirt roads or lots; small-scale roads, sidewalks, and parking lot repair. Adding rock fill or gravel to roads where no new ground disturbance will occur. *Consultation with the VASHPO required when new road construction is proposed in areas where archaeological resources are identified or expected to ensure archaeological properties will not be adversely affected.*
15. **Landscaping:** Mowing and trimming of grass, shrubs, or trees; routine vegetation control activities, including tree planting and noxious weed eradication.
16. **Erosion control:** Erosion control activities such as gravel or riprap placement on slopes, planting or seeding ground cover, cleanout of existing drainage ditches. *Consultation with the VASHPO required when erosion control measures are proposed in areas with*

previously recorded or suspected archaeological resources to ensure archaeological properties will not be adversely affected.

17. **Fencing:** Maintenance of existing fencing and installation of new chain link or post and rail fencing.
18. **Signage:** Placement of signage and public interpretation including the use of interpretive signs or exhibit structures that do not visually adversely affect an historic property.
19. **Hurricane modifications:** Modifications necessary to comply with hurricane codes. *Changes that may affect those historic qualities of a property require prior consultation with the VASHPO.*
20. **Green building technologies:** Incorporation of green building technologies to existing buildings seeking certification under the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) or other applicable standards for environmentally sustainable construction, *provided such construction does not alter or detract from the qualities that contribute to the significance of the historic property.*
21. **Wildlife habitat conservation:** Maintenance of existing property, wetlands and stream channels. Installation of nesting platforms and boxes. Installation of animal-secure fencing or barriers when consistent with fencing provision above. *Consultation with the VASHPO required if new or expanded wetlands are proposed to ensure archaeological properties will not be adversely affected.*
22. **Antiterrorism and force protection measures:** Antiterrorism measures designed and constructed to prevent or mitigate hostile actions, including cyber threats, as well as to increase capacity and protection for access control. *Requires prior consultation with the VASHPO when activities will disturb previously recorded or suspected archaeological properties to ensure archaeological properties will not be adversely affected.*
23. **Transfer of real estate to a Federal agency:** Transfer of ownership or management responsibilities of real property (including those listed in Appendix A) to management by another Federal agency with equal responsibility for complying with Sections 106 and 110 of the NHPA.

APPENDIX D

Standard Mitigation Measures

A. Properties determined eligible for inclusion in the NRHP as contributing to the NASA LaRC Historic District and are eligible only under Criterion A.

Completion of documentation in accordance with the VASHPO's DSS Intensive Level Survey requirements. Such documentation shall include a detailed architectural description of the property (exterior and interior), detailed floor plan, and photographs of exterior and interior views.

B. Properties determined eligible for inclusion in the NRHP as contributing to the NASA LaRC Historic District and are eligible under Criterion C.

Completion of documentation to include: a sketch plan of the site, photographs with large-format negatives of exterior and interior views, and a short historical narrative of the property's function and significance. Use of existing NASA LaRC photo-documentation is encouraged and acceptable where such documentation satisfactorily illustrates the current condition and configuration of the building and or facility.

C. Properties determined individually eligible for inclusion in the NRHP.

1. Completion of documentation to include: photographs with large format negatives or photographically reproduced on Mylar in accordance with the U.S. Copyright Act, as amended, select existing drawings where available. Photographs with large-format negatives of exterior and interior views, or historic views where available, and written data to include property history and description.
2. Salvage of architectural or scientific/engineering elements from historic properties where appropriate. NASA LaRC will ensure that salvage will not be undertaken without prior documentation. Qualified professionals meeting the Secretary of the Interior's *Professional Qualifications Standards* shall examine the historic property to identify if any artifacts or structural elements are worthy of salvage for preservation purposes. NASA LaRC shall ensure that the items selected are removed in a manner that minimizes damage. NASA LaRC will apply its agreement with the Smithsonian Institution ("Agreement Between the National Aeronautics and Space Administration and the Smithsonian Institution Concerning the Transfer and Management of NASA Historical Artifacts, May 28, 1998" as set forth in NASA Policy Directive [NPD] 4310.1 dated May 28, 1998) to determine appropriate retention and curation activities with respect to significant artifacts.

APPENDIX E

MODIFICATION TO EXTEND AGREEMENT

By executing this one paragraph modification, the below signatories hereby extend this Agreement for five (5) years from the date that it would have otherwise expired absent this extension.

**NATIONAL AERONAUTICS AND SPACE ADMINISTRATION,
LANGLEY RESEARCH CENTER**

_____ Date: _____
Director

ADVISORY COUNCIL ON HISTORIC PRESERVATION

_____ Date: _____
Executive Director

VIRGINIA STATE HISTORIC PRESERVATION OFFICER

_____ Date: _____
Director