Final

ENVIRONMENTAL ASSESSMENT DEMOLITION OF VARIOUS BUILDINGS AND INFRASTRUCTURE AT NASA LANGLEY RESEARCH CENTER, HAMPTON, VIRGINIA

Lead Agency:	National Aeronautics and Space Administration, Langley Research Center (LaRC), Hampton, Virginia
Proposed Action:	Demolition of Various Buildings and Infrastructure at NASA LaRC
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Abstract: NASA is proposing to demolish various buildings and infrastructure at Langley Research Center (LaRC), located in Hampton, Virginia. The facilities include Building 640 (the 8-Foot Transonic Pressure Tunnel), Building 641 (the 8-Foot High Speed Tunnel – Tunnel portion only), Building 643 (the Full Scale Tunnel), and Building 1146 (the 16-Foot Transonic Tunnel – Tunnel portion and ten small support facilities). The 8-Foot High Speed Tunnel was closed by NASA in 1956, the 8-Foot Transonic Pressure Tunnel and the Full Scale Tunnel were closed in 1996, and the 16-Foot Transonic Tunnel was closed in 2004. NASA Headquarters has approved the demolitions based on the confirmation of no current or future government need to use the tunnels and the lack of interest from non-governmental entities (industry, universities, etc.) to operate or adaptively The proposed demolitions would reduce NASA's reuse the facilities. infrastructure and allow LaRC to direct limited resources toward facilities that support NASA's overall mission, both currently and in the future. This Environmental Assessment (EA) identifies the environmental issues and impacts of the Proposed Action (demolition) and the No-Action alternative.

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EXECUTIVE SUMMARY

This Environmental Assessment (EA) has been prepared to analyze the potential environmental impacts associated with NASA's proposal to demolish four wind tunnel facilities at Langley Research Center (LaRC), located in Hampton, Virginia. The facilities include Building 640 (the 8-Foot Transonic Pressure Tunnel), Building 641 (the 8-Foot High Speed Tunnel –Tunnel portion only), Building 643 (the Full Scale Tunnel), and Building 1146 (the 16-Foot Transonic Tunnel – Tunnel portion and ten small support facilities). Buildings 640, 641 and 643 are located in LaRC's East Area on land leased from Langley Air Force Base (LAFB). Building 1146 is located in LaRC's West Area on NASA-owned land. Building 641 was closed by NASA in 1956, Buildings 640 and 643 were closed in 1996, and Building 1146 was closed in 2004. The timeframe for the proposed demolitions would be 2009 through 2012. NASA has determined that the facilities are no longer needed and that resources and funding needto be directed to facilities and operations that support the Agency's critical mission, both currently and in the future.

Purpose and Need

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

Demolition of the four facilities is needed to allow LaRC to direct limited funding towards the operation and maintenance of facilities that support the Agency's overall mission, both currently and in the future. Funds for general facility maintenance and operation at LaRC are provided by the projects and programs utilizing the facilities. Since the four wind tunnels are closed and no longer operational, no direct funding source exists for their maintenance and upkeep. NASA Headquarters (HQ) provides the funding for demolitions throughout the Agency. HQ plans to fund the demolitions based on the determination that no current or future government need exists to use the tunnels and the lack of interest from non-governmental entities (industry, universities, etc.) to operate or adaptively reuse the facilities.

Summary of Environmental Impacts

This EA analyzes the environmental impacts associated with the Proposed Action, to demolish the wind tunnels, and the No-Action alternative. Ten resource categories were evaluated to identify potential environmental impacts. The following provides a summary by resource area:

Land Use

Demolition of the facilities would be consistent with LaRC's Master Plan and the goals of the Coastal Zone Management Act (CZMA). Demolition of Building 1146 would change the functional zone land use of the area from wind tunnel testing and research to open space. Demolition of Buildings 640, 641 and 643 would change from an industrial setting to open space and NASA would transfer the land back to the Air Force. Anticipated future use of the land would be parking lots and administrative facilities. No substantial environmental impacts to land use resources would be expected with the implementation of the Proposed Action. Implementation of the No-Action alternative would result in no change to land use for any of the facilities.

Noise

Demolition activities would cause temporary increases in noise at the project areas and along traffic corridors. The buildings are located in highly developed areas within LaRC and LAFB, where high noise levels generated from aircraft and wind tunnel operations are common. Compared to noise generated by aircraft, noise produced by demolition activities would generally be more impulsive, relatively lower in magnitude, and spread out during the day. Additionally, the demolition activities would be staggered over several months. Implementation of the Proposed Action would have a negligible effect and the No-Action alternative would have no impact on the noise environment.

Cultural Resources

The 8-Foot High Speed Tunnel and the Full Scale Tunnel are National Historic Landmarks (NHLs) and the 8-Foot Transonic Pressure Tunnel and the 16-Foot Transonic Tunnel are potentially eligible for listing in the National Register of Historic Places both individually and as contributing resources to a proposed historic district. The Proposed Action would result in an adverse effect to LaRC's cultural resources, however, NASA is minimizing the impact through performing consultation and carrying out mitigation measures. In accordance with the Programmatic Agreement (PA) among NASA, the National Conference of State Historic Preservation Officers and the Advisory Council on Historic Preservation (ACHP) regarding undertakings affecting NASA's NHLs, NASA LaRC has fulfilled the consultation and mitigation requirements of the PA for the 8-Foot High Speed Tunnel and the Full Scale Tunnel. NASA LaRC is consulting with the Virginia State Historic Preservation Office and the ACHP to develop a separate Memorandum of Agreement to minimize the adverse effect of demolishing the 8-Foot Transonic Pressure Tunnel and the 16-Foot Transonic Tunnel. In order to mitigate the loss of the four historic properties, LaRC has prepared Historic American Engineering Record documentation for each of the facilities to Level I standards of the National Park Service. Additionally, NASA has developed a publicly accessible cultural resources website which includes the history, photographs, film clips, interviews with researchers, and virtual reality tours of the properties. NASA is also consulting with the Smithsonian Institution regarding salvage of significant artifacts from the historic properties. Implementation of the No-Action alternative would result in minor adverse impacts to NASA's cultural resources as the facilities would continue to deteriorate over time.

Hazardous, Regulated and Solid Waste

All hazardous and regulated waste generated from the demolition activities would be disposed of in accordance with LaRC's waste management procedures and applicable Federal, State, and local regulations. Implementation of the Proposed Action would generate a large volume of solid waste consisting of concrete, structural steel, and miscellaneous building components. Demolition contractors would be directed to recycle materials to the maximum extent possible, thereby reducing the amount of demolition debris disposed in landfills. 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. Under the No-Action alternative, the buildings would not be demolished and there would be no hazardous, regulated or solid waste generation. As such, the No-Action alternative would result in no impact to the environment.

Pollution Prevention

Demolition of the structures would be carried out following NASA LaRC's principles of pollution prevention (P2), to include source reduction, recycling/reuse, treatment and proper disposal of wastes. Materials generated from the demolition such as concrete, steel structural elements and other metals would be recycled to the maximum extent possible. Furthermore, demolition contractors would be required to follow applicable Best Management Practices to minimize pollution during demolition activities. NASA LaRC would use established P2 methods during implementation of the Proposed Action so the impacts to the environment would be minimized. Implementation of the No-Action alternative would not require the use of P2 techniques and no impacts to the environment would occur.

Health and Safety

Demolition of the facilities would be carried out by qualified and properly licensed and permitted demolition contractors. The deteriorated condition of Buildings 640, 641 and 643 could potentially pose health and safety risks for personnel working and parking near them. Implementation of the Proposed Action for these buildings could have a potential beneficial impact on health and safety as removal of the aging structures would eliminate the risk of injury to personnel from falling pieces of concrete or roof failure. Since the structural integrity of Building 1146 is currently intact, implementation of the Proposed Action for Building 1146 would not impact health and safety. Under the No-Action alternative, the buildings would continue to deteriorate, resulting in a potentially minor negative impact to health and safety due to increased risk of injury to personnel.

Visual Resources

Demolition of the facilities would remove deteriorated and aging infrastructure from the landscape and create open space within industrialized areas. Although visual resources in the immediate project area in the LaRC West Area would be temporarily degraded during the active demolition project, the resulting open space would provide enhanced visual quality as the area would be graded and seeded following demolition. Similarly, visual resources in the LaRC East Area would be temporarily degraded during active demolition activities. The possible future construction of either parking lots or new administration buildings is not anticipated to degrade or impact visual resources. As such, implementation of the Proposed Action would have a minor positive impact on visual resources at LaRC. Under the No-Action alternative, the facilities would continue to deteriorate resulting in a minor negative impact to the visual resources at the Center.

Air Quality

The demolition activities would be staggered and would result in emissions from vehicle/equipment exhaust and from fugitive dust. These effects would be minor and short-term. In addition, fugitive dust would be minimized by using control methods outlined in 9 Virginia Administrative Code (VAC) 5-50-60 <u>et. seq</u>. of the Virginia Regulations for the Control and Abatement of Air Pollution. To reduce the potential for asbestos to be released into the air, standard asbestos emission control procedures would be followed in accordance with the EPA's Asbestos Regulations (40 Code of Federal Regulations (CFR) 61 Subpart M); Langley Procedural Requirements (LPR) 1740.2, *Facility Safety Requirements*; and LPR 8800.1, *Environmental Program Manual*. Implementation of the Proposed Action would not impact the

air quality at LaRC. Under the No-Action alternative, minor localized impacts to air quality could occur if the asbestos containing materials located in the buildings began to deteriorate. However, NASA LaRC would take the necessary remedial action to ensure human health and safety regarding exposure to asbestos.

Water Resources

Due to soil disturbance during demolition activities, implementation of the Proposed Action could produce a minor and temporary increase in suspended solids in the stormwater reaching the outfalls that drain the affected areas. Demolition contractors would be required to secure the appropriate stormwater construction permits, and utilize appropriate erosion and sediment control techniques. Implementation of the Proposed Action would result in minor impacts to water resources at NASA LaRC. Under the No-Action alternative there would be no impacts to LaRC's water resources.

Wildlife Resources

Disturbance resulting from the Proposed Action would be limited to the local demolition areas on LaRC and LAFB property. The activity and noise generated from demolition activities may temporarily displace wildlife from the immediate vicinity of the project areas. It is expected that the impacts to wildlife caused by the demolition activities would be very minor and short-term. Implementation of the Proposed Action could result in minor positive impacts to wildlife as removal of the buildings would result in more open green space in the areas of the proposed demolitions. Under the No-Action alternative, there would be no impact to wildlife resources at LaRC.

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 demolition of four wind tunnel facilities at Langley Research Center (LaRC), located in Hampton, Virginia. The facilities include Building 640 (the 8-Foot Transonic Pressure Tunnel), Building 641 (the 8-Foot High Speed Tunnel – Tunnel portion only), Building 643 (the Full Scale Tunnel), and Building 1146 (16-Foot Transonic Tunnel, and ten small support facilities).

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 human environment. If implementing the Proposed Action is determined to have significant environmental impacts, an Environmental Impact Statement will 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, the purpose and need for the Proposed Action, and the planning and scoping actions being performed by NASA LaRC. Chapter 2 includes a description of the Proposed Action, the No-Action alternative, and a description of alternatives 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 an analysis of the cumulative impacts of the Proposed Action in relation to other past, present, and reasonably foreseeable actions. Appendix A, B and C contain background and supporting documentation that is referenced in the EA.

1.2 **Project Location**

NASA 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. NASA LaRC 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 space race resulting from Sputnik, 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, NASA LaRC and its complex of over 20 wind tunnels performed critical military aircraft research. From the 1980's to the present, NASA 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.

As an Agency, NASA has experienced both increasing and declining budgets since its creation. In the early 1960's, NASA's budget steadily increased, peaking in 1965 as the nation strived to put Man on the Moon by the end of the decade. In the 1990's, NASA began to face the difficult task of fulfilling its mission with significantly fewer dollars. In 1995, the Administration directed NASA to cut \$5 billion from the agency's 5-year budget plan. In addition, the President's National Science and Technology Council concluded in its Interagency Federal Laboratory Review Final Report that, given post-Cold War conditions and fiscal restraints, the Departments of Energy and Defense and NASA must downsize and restructure research, development, test and evaluation (RDT&E) facilities, define laboratory missions more clearly, manage laboratories better, and eliminate needless redundancies. The 1995 Federal Laboratory Review reported that it found major areas of "duplication of capabilities." NASA's response, known as the Zero-Base Review, identified savings through a significant agency restructuring that included cutting jobs, consolidating resources and closing facilities. Beginning in 1996, NASA made laboratory infrastructure reductions within each center by deactivating 25 wind tunnels and research facilities, including two facilities at LaRC: the 8-Foot Transonic Pressure Tunnel (Building 640) and the Full Scale Tunnel (Building 643).

Agency-wide, NASA continually evaluates its resources and infrastructure in order to align its capabilities to meet the Agency's evolving mission. NASA is currently undergoing a monumental transformation in both business practices and mission. In 2004, President George W. Bush announced a new exploration initiative (the Vision for Space Exploration) to return humans to the Moon by 2020 in preparation for human exploration of Mars and beyond. NASA is preparing to implement the Constellation Program to fabricate, test and launch a Crew

Exploration Vehicle capable of transporting humans to the International Space Station, the Moon, and to Mars.

1.4 Purpose and Need for the Proposed Action

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

Demolition of the four facilities is needed to allow LaRC to direct limited funding towards the operation and maintenance of facilities that support the Agency's overall mission, both currently and in the future. Funds for general facility maintenance and operation at LaRC are provided by the projects and programs utilizing the facilities. Since the four wind tunnels are closed and/or no longer operational, no direct funding source exists for their maintenance and upkeep. NASA Headquarters (HQ) provides the funding for demolitions throughout the Agency. HQ plans to fund the demolitions based on the determination that no current or future government need exists to use the tunnels and the lack of interest from non-governmental entities (industry, universities, etc.) to operate or adaptively reuse the facilities.

1.5 Agreement Documents Related to the Proposed Action

NASA has several agreement documents that directly relate to the Proposed Action. In 1989, a Programmatic Agreement (PA) was executed among NASA, the Advisory Council on Historic Preservation (ACHP), and the National Conference of State Historic Preservation Officers (NCSHPO). The PA establishes a process for consultation, review and mitigation regarding NASA's programs and operations that may impact facilities that are designated as National Historic Landmarks (NHLs). The main stipulations of the PA are that NASA conduct consultation, carry out mitigation measures and coordinate with agencies and interested parties regarding undertakings that could affect its NHLs. NASA's consultation and ongoing coordination actions are described in Section 1.6 below.

As three of the facilities proposed for demolition are located on LAFB property in LaRC's East Area, a 1928 Land Use Permit between NASA LaRC and the Air Force is relevant to the Proposed Action. The permit allows NASA "the right to use and occupy the …allotment areas for the purpose of constructing, using, operating and maintaining thereon, buildings, structures and utilities necessary in scientific research and experiments in the problems of flight." The agreement stipulates that upon revocation or relinquishment of the permit, NASA shall remove its property and restore the premises to a condition satisfactory to the officer having immediate jurisdiction over the premises.

NASA closed Building 643, the Full Scale Tunnel, in 1996 as the facility was no longer needed to support the Agency's mission. In 1997, Old Dominion University (ODU) and NASA signed a Memorandum of Agreement (MOA) to allow the ODU Research Foundation, a non-profit organization, to operate the tunnel for research and educational purposes. The ten-year agreement was extended in 2007 for an additional two years. ODU does not intend to renew or extend the agreement in 2009.

NASA also has an agency-wide Memorandum of Agreement with the Smithsonian Institution (Smithsonian) concerning the transfer and management of NASA historical artifacts. The agreement provides requirements and procedures for the preservation of NASA's artifacts having historical and educational value for curation or display at the Smithsonian's National Air and Space Museum.

Copies of the documents described in this section are included in Appendix A.

1.6 Consultation, Planning and Scoping Actions

Originally, the project scope included the four facilities included in this EA, and two additional facilities: LaRC's Building 1212B (7-by 10-Foot High Speed Tunnel) and Building 1297 (the Gantry). In 2006, the Gantry was removed from the demolition list as the facility was re-opened to support the Agency's new mission, the Constellation Program. Also in 2006, LaRC received funding from NASA HQ for demolition of Building 1212B. To avoid losing the funding, LaRC performed Section 106 consultation and prepared NEPA documentation in 2007 for demolition of Building 1212B. As such, some of the initial consultation and scoping letters (included in Appendix B) include Buildings 1212B and 1297.

In July of 2004, LaRC's Historic Preservation Officer (HPO) initiated Section 106 consultation with the ACHP and the Virginia State Historic Preservation Office (VASHPO) regarding the proposed demolitions. The consultation package included a letter describing the proposed demolition project, VASHPO project review forms, a map and photographs of the facilities, and a copy of the PA.

In addition to the consultation package described above, in August 2004, NASA LaRC sent scoping letters to fifteen local, state and federal agencies to elicit comments on the potential environmental and cultural resource impacts regarding the proposed demolitions. No negative comments were received.

In February 2005, NASA LaRC held a public meeting to provide a forum for the community to comment on the proposed demolitions. The meeting was publicized in the *Daily Press*, a local newspaper with regional circulation. Approximately 70 people, namely local residents and current and retired NASA LaRC employees attended the meeting. In addition to answering questions regarding the demolitions, NASA recorded comments and suggestions received from the attendees.

Also in February 2005, NASA LaRC hosted a Section 106 consultation meeting on site to discuss the proposed demolitions and tour the facilities. In addition to the ACHP, representatives from the Smithsonian, the National Park Service (NPS), VASHPO, NASA Headquarters, Langley Air Force Base, and the Virginia Air and Space Center were in attendance. Following the meeting NASA received comments from the ACHP, VASHPO and the NPS recommending that LaRC explore alternatives to demolition and/or perform an analysis of alternatives.

Throughout 2005, NASA LaRC consulted with multiple outside organizations, groups, and agencies, such as the National Institute for Aerospace, ODU, the City of Hampton, and LAFB to explore possible adaptive reuse or heritage tourism possibilities for Buildings 640, 641, 643, and

1146. Responses received cited either lack of need or funding to pursue viable reuse or heritage tourism opportunities and LAFB cited security concerns for the three buildings located on their property.

In August of 2006, NASA LaRC submitted a status report on the demolition project to the ACHP, VASHPO, and the NPS. The comprehensive report provided background information on the actions taken by NASA since initiating consultation regarding the demolition project, the current status of the project (as of August 2006), and NASA's planned future actions and schedule. In accordance with the consultation requirements of the PA, the report concluded that NASA planned to prepare an analysis of alternatives to demolition for the four facilities. No comments were received from the ACHP, VASHPO or the NPS on the status report.

In May of 2007, NASA LaRC submitted the Alternatives Analysis Report to the ACHP, VASHPO, and the NPS. The report analyzed eight alternatives (including demolition) for Buildings 640, 641, 643 and 1146. The report concluded that demolition was the only viable option and thus the preferred alternative. No comments were received from the ACHP, VASHPO or the NPS on the Alternatives Analysis Report.

Having followed the process for consultation and mitigation outlined in the PA, and receiving no comment or objection from the ACHP, VASHPO, or NPS within the specified timeframes, NASA LaRC has concluded that it has met the terms of the PA. In March of 2008, LaRC's HPO sent letters to the ACHP, the VASHPO and the NPS confirming this conclusion. The ACHP responded that since the PA only applies to NASA's NHLs, NASA LaRC would need to develop a separate MOA for demolition of Buildings 640 and 1146. NASA LaRC has developed a draft MOA which was sent to the VASHPO on June 9, 2008 for review and comment.

Copies of the consultation described in this section, planning and scoping letters, and a list of the regulatory meeting attendees are included in Appendix B.

2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

2.1 Proposed Action

The Proposed Action consists of the demolition of four wind tunnel facilities at NASA LaRC. The timeframe for the proposed demolitions would be 2009 through 2012. The facilities include Building 640 (the 8-Foot Transonic Pressure Tunnel), Building 641 (the 8-Foot High Speed Tunnel – Tunnel portion only), Building 643 (the Full Scale Tunnel), and Building 1146 (the 16-Foot High Speed Tunnel – Tunnel portion and ten small support facilities). The locations of the facilities proposed for demolition are shown in Figure 2.1.



Figure 2.1 – Location of the Buildings Proposed for Demolition

Building 640, the 8-Foot Transonic Pressure Tunnel, was operational in 1953 and was closed by NASA in 1996. Located on LAFB property, Building 640 is a three-story tall, steel framed building containing offices and technician areas supporting tunnel operations. The tunnel portion of the facility is a reinforced concrete closed circuit structure supported on steel and concrete columns. Currently, the exterior shell of the tunnel has degradation issues related to cracking concrete and exposed rebar. The building, the tunnel, and their associated foundations are proposed for demolition. In accordance with the land use agreement between NASA and LAFB, following demolition, the property would be graded to match existing contours prior to it being returned to LAFB.

Building 641, the 8-Foot High Speed Tunnel, was operational in 1936 and was closed by NASA in 1956. The facility was kept in operational condition until 1976 when critical tunnel parts, such as the fan blades, hub, nacelles, shaft, and turning vanes were removed and sent to Wright-Patterson Air Force Base in Ohio and used in the construction of a new facility. Located on LAFB property, adjacent to Building 640, the office portion of Building 641 is a two story tall building containing offices and technician areas which formerly supported tunnel operations. The associated tunnel is a reinforced concrete closed circuit tunnel structure supported on steel and concrete columns. Similar to the condition of Building 640, the exterior concrete shell of the tunnel has serious degradation issues related to cracking concrete and exposed rebar. Only the tunnel portion of Building to LAFB for continued use. In accordance with the land use agreement between NASA and LAFB, following demolition, the property would be graded to match existing contours prior to it being returned to LAFB.

Building 643, the Full Scale Tunnel, was operational in 1930 and was closed by NASA in 1996. Since 1997, ODU has operated the tunnel under a 10-year Memorandum of Agreement (MOA) with NASA. The MOA was recently extended by two years and ODU plans to discontinue operation of Building 643 after 2009. Located on LAFB property, Building 643 is a large steel framed, high bay building which houses the tunnel, technician areas and tunnel operations support offices. The tunnel is a closed circuit tunnel structure supported on steel framing with concrete foundations. The exterior of the tunnel is covered with transite (asbestos) panels. Given the wind tunnel's close proximity to the Back River, recent storms have caused significant flooding and damage within the facility. In the early 1990's, NASA replaced approximately 50% of the tunnel's roof with new metal roof panels. Currently, the remaining section of roof and the transite (asbestos) siding panels are beginning to deteriorate, which could lead to potential health and safety concerns for personnel working in and around the facility. The building, the tunnel and their associated foundations are proposed for demolition after ODU vacates the facility in 2009. In accordance with the land use permit between NASA and LAFB, following demolition, the property would be graded to match existing contours prior to it being returned to LAFB.

Building 1146, the 16-Foot Transonic Tunnel, was operational in 1941 and was closed by NASA in 2004. Currently, the wind tunnel is no longer operational as the main drive motors and other significant interior operational equipment were removed and reused at other LaRC wind tunnel facilities. Building 1146 is a two story tall masonry building containing offices and technician

areas which support tunnel operations. The associated tunnel is primarily a steel framed closed circuit tunnel structure supported on steel columns. The office portion of Building 1146 would remain intact as the proposed demolition would remove the tunnel circuit and ten small support structures, Buildings 1146A-C and 1146G-M.

Demolition activities would be carried out by qualified and properly licensed demolition contractors. All contractors performing work at NASA LaRC are required to comply with all applicable safety and health regulations, including Occupational Safety and Health Administration (OSHA) and NASA regulations. Demolition contractors 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 demolitions. Prior to demolition, the facilities would be reviewed and inspected to ensure that any significant artifacts are removed and salvaged in accordance with the Langley Policy Directive 1070.1, "Historical and Artifacts Program," and NPR 4310.1, "Identification and Disposition of NASA Artifacts." Hazardous materials such as asbestos containing building materials and lead-based paints would be removed according to LaRC policy and applicable regulations. Utilities feeding the wind tunnels and associated facilities would be disconnected and capped or otherwise terminated.

The demolition debris material would be disposed of according to LaRC's policy for the disposal of construction/demolition debris. NASA LaRC would request that the demolition 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 demolition contractor and disposed of offsite at a permitted landfill.

2.2 No-Action Alternative

Under the No-Action alternative, NASA would not demolish the four wind tunnels and they would remain closed and/or unused by NASA LaRC. Semi-annual testing of the emergency lighting and fire alarm systems would continue, which has been performed since the facilities were closed. With the exception of Building 1146, the exterior surfaces of the wind tunnels have serious degradation issues related to cracking concrete, exposed rebar, and asbestos. Implementation of the No-Action alternative would result in further deterioration of the exterior surfaces. This could have a minor adverse impact on air quality (asbestos) and also a potential impact to the health and safety of personnel working in or near the facilities.

2.3 Alternatives Considered But Not Carried Forward

Several alternatives were considered but eliminated from detailed analysis because they would not meet the purpose of the Proposed Action, to streamline LaRC's infrastructure and reduce the costs associated with maintaining facilities that are no longer needed to support NASA's overall mission. The alternatives also failed to meet the need for LaRC to redirect funding to facilities and operations that are critical in supporting the Agency's mission. LaRC analyzed and described these alternatives in a study entitled "Alternatives Analysis Report, Proposed Demolition of Various Buildings and Infrastructure," (included in Appendix C). The alternatives in the report that were considered but eliminated from detailed analysis in this EA include:

- Continued Use By NASA LaRC
- Third Party Use either as originally intended or through adaptive reuse
- Historic Site/Heritage Tourism Destination under NASA LaRC control
- Historic Site/Heritage Tourism Destination operated by third party
- Repair/Maintenance
- Mothballing (to National Park Service standards)

Given NASA's reduced budget for the maintenance of facilities under its management, expending funds for the above alternatives could affect the safety and operation of the LaRC's mission essential research facilities. Additionally, since three of the facilities are located on LAFB property, NASA LaRC requested feedback from LAFB regarding the feasibility of the above alternatives. LAFB responded that the heritage/tourism alternative is unacceptable due to security concerns, and that their providing funding for mothballing or securing an adaptive reuse situation was unlikely. Consequently, NASA has determined that implementing any of the alternatives listed above would not be feasible. Since the alternatives do not meet the purpose and need of the Proposed Action, they were eliminated from further analysis in this EA.

3.0 AFFECTED ENVIRONMENT

This chapter describes relevant environmental conditions at NASA LaRC for resources potentially affected by the Proposed Action and the No-Action alternative. In compliance with provisions contained in NEPA and CEQ regulations, and 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.

Wetlands. 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 Corpsconfirmed delineation of wetlands for portions of LaRC's West Area. No wetlands occur in the vicinity of Building 1146. For LaRC's East Area, LAFB has a wetlands delineation of the entire base (performed in 2000). Narrow sections of both vegetated and non-vegetated tidal wetland shoreline are located to the east of Buildings 641 and 643 on the other side of paved parking and road, in an industrialized setting. Since demolition activities would be restricted to the area immediately adjacent to the buildings and involve removal or disturbance of only the aboveground structures, no impacts to the shoreline would occur. Since implementation of either the Proposed Action or the No-Action alternative would not affect wetlands, this resource was eliminated from further consideration.

Terrestrial and Aquatic Vegetation. All of the buildings proposed for demolition are located in previously developed areas that do not support vegetation. Since neither the Proposed Action nor the No-Action alternative would result in the removal or addition of terrestrial or aquatic vegetation (with the exception of re-seeding after demolition), this resource was eliminated from further analysis.

Threatened and Endangered Species. All of the buildings proposed for demolition are located on previously disturbed land that is part of a developed urban setting. According to facility-wide threatened and endangered species surveys performed in the mid-1990's of both the LaRC West Area and LAFB, no threatened or endangered species and no critical habitats are known to occur in or near the areas of the proposed demolitions. As such, this resource was eliminated from further analysis.

Virginia Coastal Zone Programs. The following Virginia Department of Environmental Quality (DEQ) enforceable programs and policies are not applicable to the Proposed Action as the demolitions 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:

<u>Fisheries Management.</u> The proposed demolitions would have no effect on the conservation and enhancement of finfish and shellfish resources or the promotion of commercial and recreational fisheries.

<u>Subaqueous Lands Management</u>. The proposed demolitions would not involve encroachment into, on or over state-owned subaqueous lands.

<u>Dunes Management.</u> There are no sand covered beaches or sand dunes in the vicinity of any of the buildings proposed for demolition.

<u>Shoreline Sanitation.</u> The Proposed Action would remove buildings that are connected to the Center's sanitary sewer system, thus having no effect on shoreline sanitation.

<u>Coastal Lands Management.</u> All of the buildings proposed for demolition are located within highly developed portions of NASA LaRC and LAFB outside of the areas managed by the Chesapeake Bay Preservation Act.

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

Soils and Geology. The demolitions would involve existing structures and previously developed areas. There would be minimal ground disturbance to remove pile caps, foundations and slab sections of the structures and the areas would be backfilled, graded and seeded 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. It is estimated that the Proposed Action would occur over a period of three to four years. There would be no change in the number of NASA employees as a result of the Proposed Action. The demolition work would be performed by contractors from the regional work force or from elsewhere in Virginia. Because these are temporary jobs that would be filled by existing regional 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 NASA 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.

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. Removal of the demolition debris would be along an established haul route leading off the Center. The increase in truck traffic would be minimal because the demolitions would be phased over time. Implementation of the No-Action alternative would not affect transportation resources. Therefore, this resource was eliminated from further analysis.

Recreation. The overcrowding of recreational facilities as a result of the Proposed Action is the typical issue raised in environmental analysis of this resource. Implementation of either the Proposed Action or the No-Action alternative would not cause an increase in personnel and no expansion would occur affecting a recreational facility at LaRC. Therefore, recreational resources were eliminated from further analysis.

Since NASA 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

NASA 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 the 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 Chesapeake Bay Local Assistance Department regulates activities in the Chesapeake Bay Resource Management Areas (RMA's) and Resource Protection Areas (RPA's). These areas 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. Both RMA and RPA features exist on LaRC and LAFB property. Buildings 1146, 640 and 641 are not located within a RPA. Only the north east portion of Building 643 is within the 30-meter RPA. Buildings 641 and 643 are located within a RMA.

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, 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 (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).

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. NASA LaRC has a current Center Master Plan (CMP) for the LaRC West Area 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) for NASA LaRC:

Administration - The LaRC administrative core, which contains the Center's Headquarters building, is distinguishable by its executive character.

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.

Labs and *Science* - Labs are located in two main areas on either side of Langley Boulevard. Science offices are grouped along Dryden Avenue.

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.

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.

Outreach - Outreach offices include training facilities, student programs, the offices of public affairs, legislative affairs, news media, and affiliated universities/institutions.

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.

Vegetation Buffer - Undeveloped areas are maintained as vegetation buffers along some portions of the LaRC fence line.

Building 1146 is located in the Tunnels and Testing Zone portion of the Center. This area is highly developed, industrial-type setting with minimal open or green space. Single and twostory brick offices and support facilities, as well as parking areas are dispersed among the wind tunnel facilities.

Buildings 640, 641, and 643 are located in LaRC's East Area on LAFB property. As such, the LaRC Functional Zones are not applied to these facilities. The area mainly to the west of the buildings is highly developed and congested with research facilities, administrative and support offices, and parking areas tightly arranged within a small area. The area to the east of the buildings is a fairly open narrow strip of land, mostly paved parking and a road, that serves as a

buffer between the buildings and the northwest Branch of the Back River. Figure 3.1 shows an aerial view of LaRC's East Area.



Figure 3.1 - NASA LaRC Functional Zones

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) is 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. The Ldn parameter 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. Building 1146 is located in the 70 dBA noise contour zone and the other three buildings are located mainly in the 75 dBA noise zone.



Figure 3.2 - Noise Contours for LaRC from LAFB Flight Operations

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. Noise level surveys conducted on the various wind tunnels during peak operating mode have identified noise levels ranging from 45 to 80 dBA. 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 insures proper controls are in place to protect Center personnel from exposure to excessive noise levels in accordance with OSHA requirements.

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 are listed in the 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 its systems for property administration, land use planning and project planning.

NASA 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 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

NASA 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 NPS 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.

NASA LaRC recently completed a center-wide reconnaissance level architectural survey of 164 facilities. The survey identified that most of LaRC's West Area architectural resources are not individually eligible for the National Register. Many are, however, eligible as contributing resources to a proposed LaRC Historic District. The proposed district is discontiguous, made up of four defined significant areas separated by non-significant areas. Two areas are located in LaRC's West Area, and two are located in LaRC's East Area. Buildings 640 and 1146 are eligible both individually and as contributing resources to the proposed historic district, and the two NHLs, Buildings 641 and 643, are located within the East Area portion of the district. In addition, since the LaRC East Area is located on LAFB property, the historic district areas in LaRC's East Area lie within the proposed Langley Field Historic District (LFHD) at LAFB.

Figure 3.3 shows the locations of the four buildings and the proposed historic district boundaries. More detailed information on the histories of Buildings 640, 641, 643 and 1146 are included in the Alternatives Analysis Report, included in Appendix C.





3.3.2 Archaeological Resources

Since the mid-1970s, NASA has conducted eleven archaeological surveys in the portions of LaRC's West Area. The surveys have identified more than 20 archaeological sites located throughout the Center. Native American artifacts have been discovered as well as the remains of colonial and early American plantations. One of the sites, 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. The nearest potential archaeological survey work has been performed to confirm the site, the general location of the site has been identified through archival map research. An historical marker for the site is located approximately 91 meters (100 yards) away from Building 1146 and the remains of the plantation may exist under portions of the parking lot adjacent to the building.

LaRC's East Area at LAFB is located adjacent to the Back River. Given the river-dependency of the Native Americans and colonists in the area historically, the potential for archaeological resources exists. Archaeological surveys at LAFB have examined 370 hectares (915 acres) of the base, locating a total of 26 archaeological sites. Approximately 75 percent of the area around LaRC's Buildings 640, 641, and 643 has been surveyed and no archaeological sites are known to exist adjacent to or near the facilities. Additionally, the area has been extensively developed and disturbed by past construction activities. The nearest archaeological resources are located approximately 0.8 kilometers (0.5 miles) to the south southwest of the three facilities.

3.3.3 Traditional Resources

Several State-recognized tribes reside in eastern Virginia; however, American Indian traditional resources have not been identified in either the LaRC West or East Areas.

3.4 Hazardous, Regulated and Solid Waste

NASA 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 an EPA interim status 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 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). 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 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 currently recycles white and mixed paper, cardboard, toner cartridges, 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. It extends to air emissions, wastewater, and solid and hazardous wastes. When applying P2 methodologies to LaRC activities, 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 P2 methods such as reuse or recycling may be appropriate. Remaining wastes are then managed to minimize potential present and future environmental impacts.

NASA LaRC developed a P2 Plan in 1992 and has been implementing a Center-wide P2 Program since that date. LaRC's upper management has endorsed the NASA LaRC P2 Program through a policy statement, the LaRC Pollution Prevention Policy. This commitment conveys to all LaRC personnel the importance that upper management attributes to the P2 Program. NASA LaRC has the following P2 goals:

- Reduce the quantity and toxicity of generated wastes.
- Provide a clean and safe environment for our community.
- Ensure a safe and healthy workplace for LaRC personnel.
- Comply with all applicable laws and regulations while efficiently accomplishing our mission.
- Reduce future waste disposal liability.
- Reduce waste generation, hazardous material usage, and management costs.

To meet these goals, LaRC seeks out and implements opportunities to reduce or eliminate waste generation through P2 methodologies. In addition to waste reduction, there are other important benefits related to P2 such as reduced process operation and waste management costs, reduced emissions and waste toxicity.

At LaRC, P2 concepts are integrated throughout the entire environmental program. Pollution prevention is used as a proactive management approach to achieving or exceeding compliance

with environmental laws. Over the long term, this preventative approach greatly reduces compliance concerns and overall compliance costs and long-term environmental liability.

3.6 Health and Safety

NASA 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.

NASA 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 on-site Safety Officer and site-specific safety and health plan. For off-sight 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.

NASA 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 (LaRC Center Master Plan, 2007).

Since Buildings 640, 641, 643 and 1146 are wind tunnels, they are designated as "fluid" functional architecture. Fluid functional architecture includes the following elements:

- 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.

Building 1146 is located on the edge of the highly industrialized "downtown" portion of LaRC's West Area. This area lacks a consistent or uniform architectural style and is characterized by a mixed collection of one and two story office, research and support facilities of various designs and sizes. The wind tunnel's close proximity to the fence line makes it readily visible to travelers on adjacent Route 172.

In LaRC's East Area, Buildings 640, 641 and 643 are located next to each other in a largely industrial area adjacent to the southern branch of the Back River. The large scale of the wind tunnels characterizes the setting of this area. The administrative core of LAFB surrounds this area and features buildings that were designed by Albert Kahn. Most of these renaissance revival style administrative buildings still retain a high level of integrity. In contrast, the exterior of the tunnel circuits on Buildings 640 and 641 are severely deteriorated with cracking concrete and exposed rebar which detracts from the aesthetic quality of the facilities and the views from the adjacent Air Force office buildings. Similarly for Building 643, exterior portions of the tunnel have serious rust and flaking paint issues. Due to its enormity of size and close proximity to the water, Building 643 is a highly visible from the water and may be used as a landmark for navigation of watercraft.

3.8 Air Quality

NASA 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 an ozone maintenance area for all criteria pollutants (EPA indicators of air quality).

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.

One, small air emission source is currently in operation at Building 641. The unit is a distillate oil-fired, backup emergency generator used as an emergency backup power source for the

communications system in the office portion of the facility. This source is included in LaRC's air permit and is managed in accordance with permit requirements. No permitted air sources exist at Buildings 640, 643 or 1146.

3.9 Water Resources

Water resources include surface waters and floodplains located at NASA LaRC as well as the surrounding watershed areas potentially affected by runoff from the Center.

Surface Waters

NASA 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 NASA 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.

NASA 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 twelve permitted outfalls and the VPDES permit requires 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. Buildings 640, 641, and 643 drain completely to the Back River (outfalls 004 and 010), and Building 1146 drains to Tabbs Creek (outfalls 003 and 009).

NASA 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 permit from DEQ. LaRC employs various Best Management Practices to prevent or mitigate storm water and/or sewer system pollution from facility activities. In accordance with Virginia's Department of Conservation and Recreation (DCR), construction activities at LaRC that disturb equal to or greater than 0.4 hectares (1 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) and less than 0.4 hectare (1 acre) also require coverage.

NASA LaRC does not draw water from the surface water resources, nor does it have any collection or treatment facilities. LaRC receives all of its water from independent sources and the public water system, and it does not sell water or operate as an interstate commerce carrier. Therefore, LaRC is exempt from the Safe Drinking Water Act and Virginia Waterworks Regulations.

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. Building 1146 is not located in the floodplain. All of the LaRC East Area 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. The stillwater level for the 500-year floodplain is 2.9 meters (9.8 feet) above MSL. Figure 3.4 shows the extent of the floodplains on LaRC and the locations of the facilities proposed for demolition.



Figure 3.4 - Location of LaRC Outfalls and Floodplains
3.10 Wildlife Resources

NASA 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 would 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. Building 1146 is located in a highly developed area that offers limited value to native wildlife.

Only a relatively small portion of LaRC's East Area is forested or remains in its natural state. As such, wildlife species are predominantly associated with disturbed, urban, and coastal zone settings. Examples include: mammals such as white tailed deer, raccoon, Virginia opossum, and small rodents; Reptiles such as black rat snake, and eastern hognose snake; breeding birds such as wood thrush, Carolina wren, mourning dove, screech owl, and red-shouldered hawk; shorebirds such as plovers, willets, sanderlings, gulls, terns, sandpipers, herons, and egrets; and waterfowl such as goldeneye, redhead, blue-winged teal, and canvasback. Buildings 640, 641 and 643 are all located in a highly developed area that offers limited value to native wildlife. To the east of the buildings, adjacent to the Back River, there is a very small fringe of taller grasses and shrubs that provides limited cover for birds and small animals.

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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. The cumulative effects on the environment of the Proposed Action on other past, present, and reasonably foreseeable actions at NASA LaRC are presented in Chapter 5.

4.1 Land Use

4.1.1 Proposed Action

Coastal Zone Management

Since LaRC is located within the "coastal zone" as defined under the DEQ's Virginia 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: tidal and nontidal wetlands management, fisheries management, subaqueous lands management, dunes management, or shoreline sanitation. The remaining Coastal Zone Management Program policies relate to air and water pollution, and 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. NASA LaRC submitted a separate consistency determination to the Virginia DEQ regarding the proposed demolitions in February of 2008.

Functional Zones

Demolition of Buildings 640, 641 and 643 would initially involve a change in land use from industrial to open space. In accordance with the land use agreement between LaRC and LAFB, once the facilities were demolished the land would be transferred back to the Air Force. Anticipated future use of the land, according to the Air Force, is either parking lots or administrative facilities. Demolition of Building 1146 would involve a change in land use from industrial to open space as there are no future plans for building or development. Implementation of the Proposed Action would result in a change in the Functional Zone categorization from Zone 4, Tunnels and Testing, to Zone 10, Buffer. The Proposed Action would result in a localized environmental improvement due to an increase in open green space.

4.1.2 No-Action

Under the No-Action alternative, the buildings would not be demolished and the land use would remain unchanged. Leaving the buildings abandoned would preclude the use of the areas for future beneficial uses.

4.2 Noise

4.2.1 Proposed Action

With the implementation of the Proposed Action, heavy equipment and demolition activities would cause temporary increases in noise at the project areas and along traffic corridors. As described in Section 3.2, the buildings are located in highly developed areas within LaRC and LAFB, and high noise levels generated from aircraft and wind tunnel operations are common. Compared to noise generated by aircraft, noise produced by demolition activities would generally be more sporadic, relatively lower in magnitude, and spread out during the day.

Additionally, the demolition activities would not occur at the same time but would be staggered over several years. 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, the buildings would not be demolished and there would be no change in noise levels in the area. Implementation of the No-Action alternative would have no impact on the noise environment.

4.3 Cultural Resources

4.3.1 Architectural Resources

4.3.1.1 Proposed Action

Demolition of the four wind tunnels would have an adverse effect on NASA's historic resources; however, NASA is minimizing the impact through following the consultation and mitigation stipulations included in the existing PA for NASA's NHLs and a MOA being developed for As described in Section 1.6, in accordance with Section 106 Buildings 640 and 1146. requirements of the NHPA, LaRC began consultation with the VASHPO, the ACHP, and the NPS in 2004 regarding the proposed demolitions. Comments received from the regulators recommended that NASA perform a complete analysis of alternatives. The Alternatives Analysis Report was submitted to the VASHPO, the ACHP and the NPS in May of 2007. NASA LaRC also solicited outside organizations, such as the National Institute of Aerospace, ODU and the City of Hampton for possible reuse and adaptive reuse options. No outside parties have shown an interest in operating the wind tunnels, either as originally intended or through adaptive reuse. Copies of the consultation letters are included in Appendix B. Additionally, NASA did not receive any responses or comments from the VASHPO, the ACHP or the NPS regarding the Alternatives Analysis Report which identified demolition as NASA LaRC's preferred alternative.

In addition to completing consultation in accordance with the terms of the agreement documents as described above, NASA LaRC has carried out the following mitigation measures:

A. Recordation: Level 1 Historic American Engineering Record documentation was prepared for each facility and copies were submitted to the ACHP, VASHPO, and the NPS.

B. Coordination with the Smithsonian Institution for salvage of significant artifacts: NASA LaRC has consulted with the Smithsonian specifically regarding the salvage of the test cell from the 8-Foot Transonic Pressure Tunnel. The Curator of Aerodynamics at the Smithsonian's National Air and Space Museum (NASM) is in the process of submitting a proposal to the NASM's Collections Committee regarding the salvage of the test cell.

NASA LaRC is performing additional recordation of Buildings 640, 641, 643, and 1146 through developing a publicly accessible cultural resources website that includes:

- > technical papers and video clips of research projects performed in the buildings;
- ➢ interviews with researchers; and
- ▶ history, photographs and virtual reality tours of each of the buildings.

NASA LaRC is in the process of expanding this preservation initiative by adding an educational element to the website that includes modules and exercises incorporating the Virginia Standards of Learning. Additionally, NASA plans to make information about this preservation initiative available to the public at the Virginia Air and Space Center located in Hampton, Virginia, which serves as LaRC's Official Visitor's Center.

4.3.1.2 No-Action

Under the No-Action alternative the facilities would not be demolished and they would remain closed and/or unused by NASA with no public access to allow for interpretation and appreciation of the facilities. With minimal maintenance being performed, the exterior of the facilities would continue to deteriorate. Under the NHPA, allowing a historic property to deteriorate through neglect would result in an adverse impact.

4.3.2 Archaeological Resources

4.3.2.1 Proposed Action

The buildings are located in highly industrialized areas that have experienced previous ground disturbance and the discovery of archaeological resources would not be anticipated. In addition, the proposed demolitions would involve minimal ground disturbance activity. As such, implementation of the Proposed Action would not affect any known archaeological resources.

4.3.2.2 No-Action

Under the No-Action alternative the facilities would not be demolished and they would remain closed and/or unused by NASA. Under the No-Action alternative, no impacts to archaeological resources would occur.

4.3.3 Traditional Resources

4.3.3.1 Proposed Action

There are no traditional resources located at LaRC's West and East Areas 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's West and East Areas so the No-Action alternative would have no impact on traditional resources.

4.4 Hazardous, Regulated and Solid Waste

4.4.1 Proposed Action

In accordance with LaRC's building closure and demolition policies, Buildings 640, 641, 643 and 1146 would be thoroughly inspected for hazardous and regulated materials prior to Examples of hazardous and regulated materials include mercury switches, demolition. fluorescent light bulbs, PCB ballasts, oils and chemicals. Small amounts of asbestos containing materials are present in the buildings. These items, and the transite siding located on the exterior of Building 643, would be removed and disposed of by appropriately permitted asbestos removal contractors. All hazardous and regulated waste generated from the demolition activities would be disposed of in accordance with LaRC's waste management procedures and applicable Federal, State, and local regulations. Implementation of the Proposed Action would generate a large volume of solid waste consisting of concrete, structural steel, and miscellaneous building As described in 4.5.1, demolition contractors would be directed to recycle components. materials to the maximum extent possible, thereby reducing the amount of demolition debris disposed in landfills. 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, the buildings would not be demolished and there would be no hazardous, regulated or solid waste generation. As such, the No-Action alternative would result in no impact to the environment.

4.5 **Pollution Prevention**

4.5.1 Proposed Action

The demolitions 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 demolish the buildings 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

Demolition of the facilities would be carried out by qualified and properly licensed and permitted demolition 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 demolition projects 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 demolitions.

The exterior tunnel sections of Buildings 640 and 641 are deteriorated with cracking concrete and exposed rebar, and half of the roof at Building 643 is in need of repair or replacement. The continued deterioration of these facilities could lead to potential health and safety risks for

personnel walking or parking near the concrete tunnels, and for personnel working inside of Building 643. As such. implementation of the Proposed Action for Buildings 640, 641 and 643 could have a beneficial impact on health and safety. Building 1146 maintains its structural integrity and as such, implementation of the Proposed Action would not impact health and safety of personnel working near the facility.



Exterior of Buildings 640 and 641

4.6.2 No-Action

Under the No-Action alternative, the facilities would not be demolished and they would continue to deteriorate. For Buildings 640, 641 and 643, implementation of this alternative would result in a minor negative impact to safety and health as the continued deterioration would increase the risk of injury to humans caused by cracked concrete or roof problems. NASA would have to expend additional resources to secure the area around the buildings to protect the safety and health of personnel working in the area. For Building 1146, implementation of the No-Action alternative may result in future minor negative impacts to health and safety as the structure continues to deteriorate, however, it is difficult to determine the degradation rate of the steel tunnel circuit.

4.7 Visual Resources

4.7.1 Proposed Action

Demolition of the facilities would remove deteriorated and aging infrastructure from the landscape and create open space within industrialized areas. Although visual resources in the immediate project area in the LaRC West Area would be temporarily degraded during the active demolition project, the resulting open space would provide enhanced visual quality as the area would be graded and seeded following demolition. Similarly, visual resources in the LaRC East Area would be temporarily degraded during active demolition activities.



Side view of Building 641

The possible future construction of either parking lots or new

administration buildings is not anticipated to degrade or impact visual resources. As such, implementation of the Proposed Action would have a minor positive impact on visual resources at LaRC. Under the No-Action alternative, the facilities would continue to deteriorate resulting in a minor negative impact to the visual resources at the Therefore, implementation of the Proposed Action would have a minor positive impact on visual resources at LaRC.

4.7.2 No-Action

With the No-Action alternative, without maintenance, the exterior of the facilities would continue to deteriorate. The facilities would become "eye sores" that detract from the aesthetic quality of LaRC's East Area and surrounding LAFB facilities, and of LaRC's West Area. Continued degradation would result in a further 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 demolition activities would be staggered and would result in emissions from vehicle/equipment exhaust and from fugitive dust. These effects would be minor and short-term. In relation to the large number of personal and Government vehicles operating on the Center, the additional emissions resulting from demolition vehicles and from demolition equipment would be negligible. In addition, fugitive dust would be minimized by using control methods outlined in 9 VAC 5-50-60 <u>et. seq</u>. 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 small distillate oil-fired backup emergency generator located in Building 641 would be removed and there would be a corresponding reduction in air pollutant emissions.

The Proposed Action would not involve open burning. All demolition 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, 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 ACM would be removed from a facility before any activity begins that would break up or disturb the material.

The Proposed Action would not involve Point Source Air Pollution, so the 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 impact the air quality at LaRC.

4.8.2 No-Action

Under the No-Action alternative, the buildings would not be demolished and they would remain closed and/or unused by NASA. Since each of the facilities contains ACM, over time, the material could begin to disintegrate or crumble, potentially emitting asbestos fibers to the air. Therefore, implementation of the No-Action alternative could result in very minor impacts to air quality in the immediate localized areas of the buildings. However, NASA LaRC would take the necessary remedial action to ensure human health and safety regarding exposure to asbestos. In addition, under the No-Action alternative, the permitted emergency backup generator located at Building 641 would remain in operation.

4.9 Water Resources

4.9.1 Proposed Action

Due to soil disturbance during demolition activities, implementation of the Proposed Action could produce a minor and temporary increase in suspended solids in the stormwater reaching the outfalls that drain the affected areas. Prior to the start of demolition, silt fences, storm drain inlet and outlet protection, and other appropriate standard demolition practices would be instituted in accordance with the erosion and sediment control requirements of Virginia's Department of Conservation and Recreation (DCR). Additionally, NASA LaRC would ensure that the demolition contractors obtain the appropriate permits and prepare the required plans in accordance with DCR's construction site stormwater permit requirements.

The demolition activities would comply with provisions of Executive Order 11988, *Floodplain Management*, and the Chesapeake Bay Preservation Act. 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. Since LaRC would implement necessary Best Management Practices to reduce erosion and pollution, the Proposed Action would be consistent with the Coastal Zone Management Program.

For the East Area facilities, the area is within the 100 year floodplain boundary. Since structures built within the floodplains are at increased risk for loss and damage due to flooding, the demolition of these buildings would reduce LaRC's vulnerability to natural disaster. In addition, demolition 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 NASA LaRC.

4.9.2 No-Action

Under the No-Action alternative, the buildings would not be demolished, and there would be no impacts to LaRC's water resources.

4.10 Wildlife Resources

4.10.1 Proposed Action

Disturbance resulting from the Proposed Action would be limited to the local demolition areas on LaRC's East and West Areas. The activity and noise generated from demolition activities may temporarily displace wildlife from the immediate vicinity of the project areas. It is expected that the impacts to wildlife caused by the demolition activities would be very minor and shortterm. Implementation of the Proposed Action could result in minor positive impacts to wildlife as removal of the buildings would result in more open green space in and around the project areas.

4.10.2 No-Action

Under the No-Action alternative, the buildings would not be demolished and they would remain closed and/or unused by NASA. There would be no impact to wildlife resources with implementation of the No-Action alternative.

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 NASA LaRC's East and West areas. The timeframe includes other recent past, and present actions, continuing into the foreseeable future at LaRC. An effort has been made to 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 NASA'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 NASA LaRC's recent past, present and foreseeable future actions are related to an overarching NASA objective to streamline infrastructure and to restructure and modernize research capabilities. 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 the West Area in order to reduce the Center's unneeded and unused infrastructure. Phase I Reconnaissance Level surveys were performed on the facilities prior to demolition 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).

In the spring of 2008, LaRC began demolition of Building 1212B, the 7x10-Foot High Speed Tunnel, also located in the West Area. 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 NRHP, NASA LaRC developed an MOA with the SHPO to minimize the adverse effect of demolition. In accordance with Section 106 of the

NHPA and the mitigation stipulations of the MOA, 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.

Beginning in Fiscal Year 2009 and continuing over the next 15 to 20 years, NASA LaRC is proposing to implement a major 3-phase modernization and upgrade project in LaRC's West Area called New Town. Site improvements would include new construction of approximately 40,000 square meters (430,000 square feet) and demolition of over 65,000 square meters (700,000 square feet) as well as upgrades to roadwork, parking lots, utilities, and an extended pedestrian walkway. Planned improvements would focus on enhancing LaRC's current and future mission performance capabilities, maintaining the Center's overall "campus feel" and ensuring the quality of life for employees. This initiative would demolish aging and inefficient facilities to be replaced by modern offices and research laboratories. LaRC is not anticipating a significant change in the size of the Center workforce during the New Town project. The new facilities, and modifications to existing facilities would meet the Leadership in Energy and Environmental Design (LEED) silver standards for building design and, as much as possible, be consistent with the current architectural styles located throughout the Center. In accordance with Section 106 of the NHPA, LaRC is in the process of performing consultation and developing a PA with the VASHPO, and the ACHP to minimize the adverse impacts caused by building renovations and demolitions. In addition, NASA LaRC in the process of 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.

For LaRC's East Area located on LAFB property, past actions performed by LaRC have involved minor repair and modifications to the NASA facilities. Aside from the Proposed Action, LaRC has no major current or planned activities to the remaining NASA facilities. In contrast, the Air Force has numerous past, present and future actions completed and planned throughout LAFB and around LaRC's East Area. Table 5.1 provides a timeframe and a brief description.

Time Frame	Action/Description								
Past (within the	Demolition of Building 720 (the Mile Long Building); demolition of old marina								
past 8 years)	restaurant and construction of new marina restaurant; demolition of 3 hangars								
	and construction of 3 new F-22 hangars; demolition of 2 water towers;								
	construction of a new storm sewer pump house; demolition of Building 633								
	(adjacent to Buildings 640 and 641) and construction of a parking lot.								
Present	Privatization of military family housing; construction of mechanical buildings in								
	HQ ACC campus area, construction of ADA accessible elevator towers in six								
	buildings; construction of a vacuum sewer building.								
Future (within	Possible demolition of up to 14 garages and construction of up to 24 garages;								
the next 10 years)	possible demolition of 2 hangars; construction of 2 new housing units.								

 Table 5.1 – Past, Present, and Future Possible Actions at LAFB

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, NASA 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.

For LaRC's East Area, to assess the cumulative cultural resource effects for projects that have occurred or that are planned at LAFB, the U.S. Air Force Air Combat Command prepared a draft assessment in 2006, "Assessment of the Cumulative Effects of Development at Langley Air Force Base, Virginia, on the Proposed Langley Field Historic District." The draft assessment, which is still under review by the VASHPO, states that overall, the development should not threaten the eligibility of the proposed Langley Field Historic District, as long as LAFB avoids major undertakings impacting historic properties and performs the appropriate consultation and mitigation in accordance with Section 106 for smaller projects. LaRC's Buildings 640, 641 and 643 were mentioned in the assessment as proposed for demolition and that NASA LaRC would be responsible for performing Section 106 consultation and mitigation.

NASA 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 result in impacts to the Center's cultural resources. The impacts would be caused by the loss or alteration of historic properties and the potential change in the character or integrity of NASA LaRC's proposed historic district. In accordance with Section 106 of the NHPA, LaRC plans to minimize the impacts to historic properties through performing consultation with the VASHPO and other interested parties, and carrying out appropriate mitigation measures to preserve NASA LaRC's history. In accordance with the NHPA, NASA LaRC is developing a center-wide PA for the New Town project, as well as other routine actions performed at the Center. To the maximum extent practicable, and in accordance with the requirements of the PA, NASA LaRC will take into consideration the effect that LaRC's actions may have on individual properties as well as the overall integrity of NASA LaRC's proposed historic district.

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6.0 REFERENCES

Advisory Council on Historic Preservation (ACHP), 2008. *Working with Section 106*. <u>http://www.achp.gov/work106.html</u>

Council on Environmental Quality (CEQ), 1997. *Considering Cumulative Effects Under the National Environmental Policy Act*. <u>http://www.nepa.gov/nepa/ccenepa.htm</u>

NASA Langley Research Center, 1991. Wetland Investigations at NASA Langley Research Center, Hampton, Virginia. AMRL Technical Report No. 800. Prepared by Old Dominion University, Norfolk, VA.

NASA Langley Research Center, 1992. Wetland Survey of Forested Lands Adjacent to Buildings 1209, 1250 and 1251 at NASA Langley Research Center. Final Report. AMRL Technical Report No. 891. Prepared by Old Dominion University, Norfolk, VA.

NASA Langley Research Center, 1995. *Baseline Biological Survey of Terrestrial and Aquatic Habitats at NASA Langley Research Center, with Special Emphasis on Endangered and Threatened Fauna and Flora.* Prepared by Old Dominion University, Norfolk, VA.

NASA Langley Research Center, 1995. *Phase I Archaeological Resource Survey of Selected Proposed Construction Sites, NASA Langley Research Center, City of Hampton, Virginia.* Prepared by Gray & Pape, Inc., Richmond, VA.

NASA Langley Research Center, 1996. *Phase I and II Archaeological Investigations of Selected Proposed Construction Sites, NASA Langley Research Center, City of Hampton, Virginia.* Prepared by Gray & Pape, Inc., Richmond, VA.

NASA, 1999. *NASA Procedural Requirement (NPR)* 4340.1, *Identification and Disposition of NASA Artifacts*. <u>http://nodis3.gsfc.nasa.gov/displayDir.cfm?t=NPR&c=4310&s=1</u>

NASA, 2001. NASA Procedural Requirement (NPR) 8580.1, Implementing the National Environmental Policy Act and Executive Order 12114. http://nodis3.gsfc.nasa.gov/npg_img/N_PR_8580_0001_/N_PR_8580_0001_.pdf

NASA Langley Research Center, 2003. *Environmental Assessment, Demolition of Fourteen Buildings at NASA Langley Research Center*. Prepared by SAIC, Hampton, VA.

NASA Langley Research Center, 2004. *Wetland Delineation Report on Wooded Lands, Langley Research Center, Hampton, VA.* Prepared by Sandra Brinson and SAIC, Hampton, VA.

NASA Langley Research Center, 2007. Environmental Assessment, Demolition of Building 1212B, the 7- by-10-Foot High Speed Tunnel at NASA Langley Research Center. Prepared by SAIC, Hampton, VA.

NASA Langley Research Center, 2007. Environmental Resources Document.

NASA Langley Research Center, 2007. LPR 8800.1, LaRC Environmental Program Manual. http://lms.larc.nasa.gov/admin/documents/LPR8800-1.pdf

NASA Langley Research Center, 2007. *Pollution Prevention / Sustainability Program Plan*. Prepared by SAIC, Hampton, VA.

NASA Langley Research Center, 2008. *LaRC Center Master Plan.* <u>http://gis-www.larc.nasa.gov/masterplan/</u>

NASA Langley Research Center, 2008. *Cultural Resource Management Plan*. Prepared by SAIC, Hampton, VA.

NASA Langley Research Center, 2008. Langley Procedural Requirements (LPR) 1740.2, Facility Safety Requirements. <u>http://lms.larc.nasa.gov/admin/documents/LPR1740-2.pdf</u>

NASA Langley Research Center, 2008. *Phase I Reconnaissance Level Survey of Architectural Resources at the National Aeronautics and Space Administration, Langley Research Center.* Prepared by Dutton & Associates, LLC, Richmond, VA.

National Park Service, 1984. *Man in Space Theme Study*. <u>http://www.cr.nps.gov/history/online_books/butowsky4</u>

National Register of Historic Places, 2007. www.nationalregisterofhistoricplaces.com

Presidential Decision Directive, National Science and Technology Council, 1997. *Status of Federal Laboratory Reform*. <u>http://www.fas.org/irp/offdocs/pdd5status.html</u>

RAND, 2004. *An Assessment of NASA's Capabilities to Serve National Needs* <u>http://www.rand.org/pubs/monographs/2004/RAND_MG178.pdf</u>.

U.S. Air Force, Air Combat Command, 2006. *Draft Assessment of the Cumulative Effects of Development at Langley Air Force Base, Virginia, on the Proposed Langley Field Historic District.* Prepared by Geo-Marine, Inc., Plano, TX.

U.S. Army Corps of Engineers, 2005. *Langley Air Force Base Archaeological Survey of 406 Acres*. Prepared by Geo-Marine, Inc., Plano, TX.

U.S. Government Accounting Office, 1996. Report to the Chairman, Subcommittee on National Security, International Affairs, and Criminal Justice, Committee on Government Reform and Oversight, House of Representatives, *NASA Infrastructure: Challenges to Achieving Reductions and Efficiencies*, Appendix II. <u>http://www.gao.gov/archive/1996/ns96187.pdf</u>

7.0 LIST OF PREPARERS AND CONTRIBUTORS

The NASA LaRC Environmental and Logistics Branch prepared this Environmental Assessment (EA) for the demolition of various buildings and infrastructure at NASA LaRC. Individuals listed below contributed to the completion of this draft EA by writing basic components of the document, contributing background and supporting documents, or providing technical review and comment on the draft.

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Kenneth Kumor, MBA, J.D. NEPA Compliance NASA Environmental Management Division

James McGrath Air Compliance Specialist Science Applications International Corporation Tina Norwood Federal Preservation Officer NASA Environmental Management Division

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8.0 LIST OF PERSONS CONTACTED

Dr. John Anderson, Curator of Aerodynamics, National Air and Space Museum, Smithsonian Institution, Washington, D.C.

Mr. William Arguto, Environmental Review Coordinator, U.S. Environmental Protection Agency Region 3, Philadelphia, PA.

Mr. William Bolger, Architectural Historian, National Park Service, Philadelphia, PA.

Mr. Todd Bridgford, Executive Director, Virginia Air and Space Center, Hampton, VA.

Mr. Charles Bryan, Jr., President, Virginia Historical Society, Richmond, VA.

Mr. Charles Burgess, Jr., City Manager, City of Poquoson, VA.

Mr. Arthur Collins, Executive Director, Hampton Roads Planning District Commission, Chesapeake, VA.

The Honorable James Connaughton, Chair, Council on Environmental Quality, Executive Office of the President, Washington, D.C.

Ms. Brenda Cook, Deputy Base Civil Engineer, Langley Air Force Base, Hampton, VA.

Ms. Jody Cook, Historic Landmarks Program Manager, National Park Service, Southeast Regional Office, Atlanta, GA.

Mr. Hugh Cowsert, Base Development Chief, 1st Civil Engineering Squadron, Langley Air Force Base, Hampton, VA.

Mr. James Cross, Program Chair, Department of Aerospace Engineering, Old Dominion University, Norfolk, VA.

Ms. Ethel Eaton, Director of Project Review, Virginia Department of Historic Resources, Richmond, VA.

Mr. Roger Ferguson, Environmental and Logistics Branch, NASA LaRC, Hampton, VA.

Mr. Carter Ficklen III, Industrial Hygienist, HAZMED, NASA LaRC, Hampton, VA.

Ms. Mary Gainer, GIS Team, Center Operations Directorate, NASA LaRC, Hampton, VA.

Mr. Rodney Harris, Historic Preservation Officer, Chief Architect, Center Master Planner, Center Operations Directorate, NASA LaRC, Hampton, VA.

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Ms. Ellie Irons, Office of Environmental Impact Review, Virginia Department of Environmental Quality, Richmond, VA.

Mr. Peter Jakab, Chairman of Aeronautics Division, Smithsonian National Air and Space Center, Washington, D.C.

Ms. Kristin Kirchen, Architectural Historian, Office of Review and Compliance, Virginia Department of Historic Resources, Richmond, VA.

Mr. Kenneth Kumor, NEPA Compliance, Environmental Management Division, NASA HQ, Washington, D.C.

Mr. Roger Launius, Chairman of Space History Division, Smithsonian National Air and Space Center, Washington, D.C.

Mr. Lawrence Lee, Heritage Documentation Division, National Park Service, Washington, D.C.

Mr. Robert Lindberg, President, National Institute of Aerospace, Hampton, VA.

Mr. James McGrath, Air Program Environmental Specialist, SAIC, NASA LaRC, Hampton, VA.

Mr. Thomas McCulloch, Historic Preservation Specialist, Advisory Council on Historic Preservation, Washington, D.C.

Mr. James McReynolds, County Administrator, York County, VA.

Ms. Tina Norwood, Federal Preservation Officer, Environmental Management Division, NASA HQ, Washington, D.C.

Mr. John Quarstein, Director of the Virginia War Museum and Administrator of Historic Services and Museums of the City of Newport News, Newport News, VA.

Ms. Roseanne Runte, President, Old Dominion University, Norfolk, VA.

Mr. John Sprinkle, Jr., National Historic Landmarks Program, National Park Service, Washington, D.C.

Mr. Gregory Sullivan, Head, Environmental and Logistics Branch, NASA LaRC, Hampton, VA.

Mr. Jackson Tuttle, City Manager, City of Williamsburg, VA.

Mr. George Wallace, City Manager, City of Hampton, VA.

Mr. Sanford Wanner, County Administrator, James City County, VA.

Ms. Joanna Wilson, Archaeologist, Office of Review and Compliance, Virginia Department of Historic Resources, Richmond, VA.

Ms. Laura E.B. Yates, Base Community Planner, 1st Civil Engineering Squadron, Langley Air Force Base, Hampton, VA.

APPENDIX A

Agreement Documents Related to the Proposed Action

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PROGRAMMATIC AGREEMENT AMONG THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, THE NATIONAL CONFERENCE OF STATE HISTORIC PRESERVATION OFFICERS, AND THE ADVISORY COUNCIL ON HISTORIC PRESERVATION

WHEREAS, the National Aeronautics and Space Administration (NASA) undertakes research, development, space mission operations, and management use of its facilities which have been designated as National Historic Landmarks (Landmarks) (Attachment 1); and

WHEREAS, such facilities require frequent modification over the life of agency missions to adapt them to meet the requirements of ongoing NASA programs; and

WHEREAS, NASA has determined that such modifications may have an effect on those Landmarks, and has consulted with the National Conference of State Historic Preservation Officers (NCSHPO) and the Advisory Council on Historic Preservation (Council) pursuant to the regulations (36 CFR Part 800) implementing Sections 106 and 110(f) of the National Historic Preservation Act, as amended (16 U.S.C. 470f and 470h-2(f)); and

WHEREAS, the Department of the Interior, National Park Service (NPS) was invited and participated in the consultation;

NOW, THEREFORE, NASA, the NCSHPO, and the Council agree that the programs shall be implemented in accordance with the following stipulations in order to take into account the effect of the programs and specific undertakings on the Landmarks.

Stipulations

NASA will ensure that the following measures are carried out.

I. Categories of Activities

A. When the proposed undertaking involves any of the following activities, NASA shall consult with the appropriate SHPO and, as necessary, the Council in accordance with Stip. II:

 Demolition, dismantling, or relocation of original engineering structures, or of buildings housing facilities;

 Removal or excessing of significant elements of the Landmarks specifically named on the National Register nomination forms;

3. New construction not compatible with major portions of the original structure or which alter the characteristics of the

facility which were specified as the reason for its Landmark designation; or

Changes in function, purpose, or use of a facility.

B. When the proposed undertaking is limited to the following activities that will not alter the characteristics of the facility which were specified as the reason for its landmark designation, NASA shall develop and implement mitigation measures in accordance with Stipulation III:

Replacement of historic hardware or components;

 Modification of the original structure or equipment used in engineering structures, or buildings housing facilities; or

 New construction compatible with existing structure, purpose, and operation of the facility.

NASA shall include a description of such activities and mitigation measures in the annual summary of its activities prepared pursuant to Stipulation IV.A.

C. When the proposed undertaking involves none of the activities specified above, NASA may proceed without consultation or the implementation of mitigation measures.

II. Consultation Process

A. Consultation required under Stip. I.A. shall be conducted as follows:

 NASA shall provide the following documentation to the SHPO for review:

 a. a description of the undertaking, with photos, maps, and drawings;

b. a description of the affected Landmark;

 c. a description of the effects of the undertaking on the affected Landmark;

 a description of alternatives to the proposed action, which were considered if any, and reasons not chosen;

a description of any mitigation measures proposed;
 a description of NASA's effort, if appropriate, to

obtain and consider views of affected interested persons on the proposed undertaking, including a copy of any comments received; and

g. the planning and approval schedule for the proposed undertaking.

Whenever feasible, NASA shall give the SHPO advance notice that such documentation is under preparation, and advise the SHPO of a date certain that it intends to submit the documentation to the SHPO. 2. The SHPO shall respond to a written request for consultation (accompanied by the documentation specified in Stip. II.A.1) within 20 working days, and agree, conditionally agree, or disagree with NASA's proposal.

3. If NASA does not accept the SHPO's conditions, or if NASA and the SHPO disagree, NASA shall notify the Council and forward copies of the documentation specified in Stip.II.A.1, above, along with other information relevant to the dispute.

4. Within 20 working days, the Council shall either: (1) attempt to resolve the dispute; (2) provide NASA with recommendations to be taken into account in implementing the activity; or (3) decide to comment, and comment within 45 working days of that decision. At NASA's request, the time periods in Stips. II.A.2. and II.A.4. will run concurrently. In exceptional circumstances NASA may request accelerated consideration under Stip. II.A.4. and the Council will make a good faith effort to accommodate such requests. The Council may consult with the National Park Service of the Department of the Interior during its review period.

B. The Council and the NCSHPO recognize that operational emergency situations may arise where NASA must take immediate action without prior consultation with the appropriate SHPO or the Council. In such situations, NASA shall notify the Council and the SHPO of such actions as soon as practicable.

III. Mitigation

Mitigation measures shall be carried out prior to undertaking actions specified in Stips. I.A. and I.B.

A. Recordation

 Recordation shall be done in accordance with the Secretary of the Interior's "Standards for Architectural and engineering Documentation" (Standards) (Federal Register, 48 FR 190, pp. 44730-44734, September 29, 1983).
 Because original "as-built" drawings and other records

2. Because original "as-built" drawings and other records are on file at the installations containing Landmark facilities, documentation will normally include the following: (1) reproduction of existing "as-built" drawings and site plans modified on standard size (19 x 24 or 24 x 36) mylar; and (2) provision of black and white archival quality photos with large format negatives of exterior and interior views, as appropriate, as well as special technological features or engineering details.

3. Original copies of all documentation shall be provided to the Secretary of the Interior in accordance with the Standards for incorporation into the National Architectural and Engineering Records in the Library of Congress as provided in Section 101 of the National Historic Preservation Act and implementing procedures. Copies of the documentation shall also be provided to the appropriate SHPO.

B. Salvage

NASA will apply its agreement with the Smithsonian Institution (NASA Management Instruction 4310.4) to determine appropriate retention and curation activities with respect to significant artifacts.

IV. Continuing Coordination

A. On or about December 1, 1990, and annually thereafter, NASA will provide a summary of its activities under this Agreement to the Council and to the NCSHPO.

B. In consultation with the appropriate SHPO, the Council may review and comment upon individual undertakings when it determines that historic preservation issues warrant such action.

C. NASA will provide appropriate public information about activities under Stip.I.A. to interested parties upon request.

D. Any party to this Agreement may terminate it by providing 60 days notice to the other parties, provided that the parties will consult during the period prior to termination to seek agreement on amendments or other actions that would avoid termination.

Execution of this Programmatic Agreement and carrying out its terms evidences that NASA has afforded the Council and the NCSHPO a reasonable opportunity to comment on its programs affecting Landmarks under Sections 106 and 110(f) of the National Historic Preservation Act, and that NASA has taken into account the effects of its programs on these Landmarks.

NATIONAL AERONAUTION OND SPACE ADMINISTRATION	
By:	9/20/89
for Management	/ Date
NATIONAL CONDERENCE OF STATE HISTORIC PRESERVATION	OFFICERS
By: Mureun Chle	10/6/59
President	Date
ADVISORY COUNCIL ON HISTORIC PRESERVATION	It's wiese
Chairman	Date

ATTACHMENT 1

NASA'S NATIONAL HISTORIC LANDMARKS

(as of 2/24/89)

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WHEREAS on April 24, 1919, the Acting Secretary of War approved the setting aside of that portion of the Langley Field Military Reservation, Virginia, known as Plot No. 16, for use by the National Advisory Committee for Aeronautics for its purposes in constructing laboratories or other utilities necessary in scientific research and experiments in the problems of flight;

WHEREAS by permit dated July 24, 1929 and amendments thereto, and various other forms of permission the National Advisory Committee for Aeronautics has been granted permission, from time to time, to construct buildings and utilities on said plot No. 16 and other portions of the Langley Field Military Reservation, Virginia; and

WHEREAS, due to the numerous amendments to the permit of July 24, 1929 and other forms of permission granted to the said Committee for various privileges on said reservation, it is the desire of the Secretary of War to consolidate in one permit all of the privileges heretofore granted to the said Committee, except the permits dated January 22, 1930 and September 17, 1934, authorizing the laying of cables in the southwest branch of Back River, Virginia;

NOW, THEREFORE, the NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS is hereby granted permission, revocable at will by the SECRETARY OF WAR, to use and occupy Plot No. 16 and other portions of the LANGLEY FIELD MILITARY RESERVATION, Virginia, for the purpose of constructing, using, operating, and maintaining thereon buildings, structures and utilities necessary in scientific research and experiments in the problems of flight as indicated on the National Advisory Committee for Aeronautics' drawing No. X-6400, entitled "Official Map, N.A.C.A. Land Allotments and Structures, Langley Field, Virginia," last revision date November 7, 1938, blueprint of which is on file in the office of The Quartermaster General, War Department, Washington, D. C., and by this reference made a part hereof.

THIS PERMIT is granted subject to the following provisions and conditions:

1. That the type of architecture for said buildings, structures and utilities shall conform as nearly as possible to the architectural type of existing buildings, structures and utilities on said reservation, and no work shall be commenced thereon until the plans for same have been submitted to and approved by The Quartermaster General.

2. That the construction, operation and maintenance of said buildings, structures and utilities shall be accomplished without cost to the War Department, under the general supervision and subject to the approval of the Commanding Officer, Langley Field, or other competent military authority.

3. That before the commencement of any work which comes within the provisions of the Act of Congress approved March 3, 1899 (30 Stat. 1151), approval of the plans thereof shall be obtained from the Secretary of War and the Chief of Engineers in accordance with the said Act of Congress.

4. That the station installed at the wind tunnel for transforming current from the subterranean electric power cable extending from low water mark on the north shore of Back River to said wind tunnel, shall permit a connection therewith for standby service in the event a breakdown should occur in the Post system or the transmission line leading thereto.

5. That the personnel and operations of the National Advisory Committee for Aeronautics shall, in connection with the exercise of the privileges herein authorized, be under the control of the Commanding Officer, Langley Field, in all matters pertaining to discipline, fire, guard, police and sanitation.

6. That, upon revocation or relinquishment of this permit, the National Advisory Committee for Aeronautics shall, within such reasonable time as the Secretary of War may indicate, remove its property from the reservation and restore the premises hereby authorized to be used and occupied to a condition satisfactory to the said Commanding Officer, or other competent military authority.

7. That this permit supersedes and is in lieu of the formal permit granted to the National Advisory Committee for Aeronautics on July 24, 1929 as amended, and all other forms of permission by which the said Committee has been granted privileges on said reservation, except the permits dated January 22, 1930 and September 24, 1934 authorizing the laying of cables in the southwest branch of Back River, Virginia.

DATED this 2nd day of March , 1939.

(Sgd) Louis Johnson Louis Johnson, The Assistant Secretary of War.

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NPR 4310.1 Effective Date: March 16, 1999 Expiration Date: March 16, 2011

COMPLIANCE IS MANDATORY

Printable Format (PDF)

Subject: Identification and Disposition of NASA Artifacts (Revalidated w/Change 2 1/31/06)

Responsible Office: Logistics Management Division

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Appendix A: Agreement Between the National Aeronautics and Space Administration and the Smithsonian Institution Concerning the Transfer and Management of NASA Historical Artifacts, May 28, 1998.

AGREEMENT BETWEEN THE AND THE SMITHSONIAN INSTITUTION CONCERNING THE TRANSFER AND MANAGEMENT OF NASA HISTORICAL ARTIFACTS

<u>WHEREAS</u> in the course of its programs the National Aeronautics and Space Administration produces a large number of artifacts, many with great historical value and others with great value for education, exhibition, and other purposes, relating to the development, demonstration, and application of aeronautical and astronautical science and technology of flight, and will continue to acquire such materials; and

<u>WHEREAS</u> such artifacts are unique specimens relating to the science and technology of aeronautics and astronautics, and of flight in the atmosphere and space, which may consist of aeronautical and astronautical objects, but not limited to, aircraft, space launch vehicles, spacecraft (both manned and unmanned), sub-systems of the above, such as rocket engines, pressure suits and personal equipment, instruments, significant recorded data, operating handbooks, drawings, photographs, motion picture film and related documents, audio and video tapes, training devices, simulators, and memorabilia; and

<u>WHEREAS</u> the Smithsonian Institution is charged with the responsibility to preserve for perpetuity artifacts representative of aviation and space flight; to collect, preserve, and display aeronautical and space flight equipment of historical and educational interest and significance; to serve as a repository for scientific equipment and data pertaining to the development of aviation and space flight; and to provide educational material for the historical study of aviation and space flight.

<u>THEREFORE</u>, under the authority set forth in Section 203(c)(6) of the National Aeronautics and Space Act of 1958, as amended (72 Stat. 430; 42 U.S.C. 2473 (c)(6); Section 4 of the Act of August 30, 1961 (75 Stat. 415, 20 U.S.C. 80c); and Sections (4) and (8) of the National Air Museum Amendments Act of 1966(80 Stat. 310, 311; 20 U.S.C. 77a, 77d), the National Aeronautics and Space Administration (hereafter called "NASA") and the Smithsonian Institution (hereafter called "Smithsonian") enter into this Agreement concerning the transfer and management of those artifacts having such historical and educational or other value which have emerged and will emerge from the aeronautical and space programs administered by NASA.

1. NASA shall offer to transfer to, and the Smithsonian may accept as rapidly as reasonably possible, such artifacts under NASA control which become available, after programmatic utility to NASA or other government agencies has been exhausted, although, in extraordinary circumstances, exceptions or alternative dispositions can be made by NASA. Before the decision to make an exception or alternative disposition is made, the proposed action shall be

referred to the Joint Artifacts Committee (established in paragraph 4, below) for consideration. In addition, the Smithsonian may, pursuant to the procedures contained in paragraph 4, call a special meeting of the Joint Committee to discuss the transfer or preservation of items of unusual historical interest that NASA has not yet declared to be artifacts. In either instance, if no consensus can be achieved by the Joint Artifacts Committee, the issue shall, upon request of either NASA or the Smithsonian, be referred to the NASA Administrator and the Director of the Smithsonian's National Air and Space Museum (NASM) for consideration. In the event agreement still cannot be reached, the NASA Administrator will decide the issue. NASA undertakes no obligation to provide financial support to the Smithsonian.

2. The Smithsonian Institution's National Air and Space Museum will accession into its National Collections and accept responsibility for the custody, control, protection, preservation, and display of such artifacts transferred by NASA both in the Museum itself and on loan to NASA and other appropriate organizations in a manner consistent with the prevailing collections policy of NASM. If NASM refuses a request from a NASA component or visitor center for a loan of a NASA artifact, or states its intention to terminate or not to renew an existing loan to NASA, NASA may call a meeting of the Joint Committee at which the reasons for and possible alternatives to the denial will be discussed. Loans of artifacts to NASA shall be made for periods of from three to five years, with the expectation that renewals will be granted. NASM may specify reasonable curatorial practices to be followed by NASA components or visitor centers with respect to loaned NASA artifacts, and NASA will implement these practices to the extent practicable.

3. In connection with the NASA artifacts transferred to the Smithsonian, it is understood that in no instance shall a NASA artifact be finally disposed of to an agency other than the United States Government, or destroyed, before an opportunity is extended to NASA to reacquire, not on a basis of purchase but of reasonable defrayment of the costs involved, custody and control of the artifacts. Further, in the event that NASA determines that an item declared an artifact and transferred to the Smithsonian has renewed technical utility with respect to NASA's programs, the NASA Chair of the Joint Artifacts Committee may request NASM to loan the item back to NASA. NASM will make a good faith effort to comply with the NASA request in light of NASA's stated need and the potential impacts on the NASM collection and/or operations. In utilization of this procedure, both NASA and the NASM will work promptly and closely to minimize any adverse impact that the loan could have on NASM operations. Cost of shipping and packaging the item for return to NASA will be borne or reimbursed by NASA.

4. The Smithsonian and NASA will establish a Joint Artifacts Committee to collect information on and consider issues relating to NASA artifacts and their transfer to the Smithsonian. This charter includes but is not limited to, those issues identified for Committee consideration in paragraphs 1 and 2 above. It is anticipated that the Committee will meet at least two times per year, although either NASA or NASM may call a special meeting on 30 days notice.

5. The agreement shall be effective for five years from the date of the latest signature. Unless written notification is given by either party at least six months prior to expiration, it will be renewed automatically for an additional five years.

/s/ J. R. Dailey	/s/ Donald D. Engen
John R. Dailey	Donald D. Engen
Deputy Administrator	Director
National Aeronautics and Space	National Air and Space Museum
Administration	Smithsonian Institution
28 May 98	May 28,1998

Date

Date

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OFFICE OF THE VICE PRESIDENT FOR RESEARCH 2035 Hughes Hall Norfolk, Virginia 23529 Phone (757) 683-3460 Fax (757) 683-5902

MEMORANDUM

To: Douglas L. Dwoyer Associate Director for Operations NASA Langley Research Center Hampton, VA 23681-2199 December 13, 2006

lessa hi From: Dr. Mohammad Karim Vice President for Research

Subject: Continuation of 30- by 60-foot full-scale wind tunnel facility operations in Building 643, until August 18, 2009.

Date: December 13, 2006

In accordance with Modification No. 4 to Memorandum of Agreement SAA1-409, between Old Dominion University and the National Aeronautics and Space Administration Langley Research Center for the operation of the 30- by 60-foot full-scale wind tunnel facility (Building 643, located on Langley Air Force Base, Virginia), dated December 13, 2006, Old Dominion University and NASA LaRC are required to agree mutually to the extension of the original agreement for periods of two years. The purpose of this Memorandum is to initiate mutual approval of the first two-year extension to SAA #409, extending the agreement until August 18, 2009. We understand that when funds become available, NASA intends to demolish Building 643 and the full-scale tunnel.

Approved Douglas L. Dwover

Douglas L. Dwoyer Associate Director of Operations Mail Stop 106 NASA Langley Research Center Hampton, VA 23681-2199 Date 12/14/06

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MODIFICATION NO. 4 TO MEMORANDUM OF AGREEMENT SAA1-409 BETWEEN THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION LANGLEY RESEARCH CENTER AND OLD DOMINION UNIVERSITY AND OLD DOMINION UNIVERSITY RESEARCH FOUNDATION CONCERNING OPERATION OF THE 30-BY-60 FOOT FULL SCALE WIND TUNNEL LOCATED ON LANGLEY AIR FORCE BASE, VIRGINIA

PREAMBLE:

The National Aeronautics and Space Administration (NASA), Langley Research Center (LaRC), and Old Dominion University (ODU) of the Commonwealth of Virginia, and Old Dominion University Research Foundation (ODURF), entered into a Memorandum of Agreement (SAA1-409), effective on August 18, 1997. NASA LaRC, ODU and ODURF desire to modify Article 3. Pursuant to Article 19 ("Notices and Modifications") of SAA1-640, Article 3 is amended as follows:

AMENDMENTS:

1. Article 3 ("Period") shall be amended to change the first paragraph as follows:

This Agreement shall be effective on the date signed by all signatories. The Agreement will be in effect for ten (10) years. At the expiration of the ten (10)- year period, the Parties may extend this Agreement for periods of two (2) years per extension by the mutual consent of the Parties. Each extension shall be made in writing and signed by both Parties in accordance with the provisions of Article 19.2 of this Agreement.

2. All other terms and conditions of the Agreement are hereby ratified and confirmed as remaining in full force and effect.

SAA1-409

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Douglas L. Dwoyer Associate Director for Operations NASA Langley Research Center

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Date

Kessi A. Kno

Mohammad Karim Vice President, Research Old Dominion University of the Commonwealth of Virginia

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Date

4. B. Smith

Ruth B. Smith Executive Director Old Dominion University Research Foundation

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Date

FOR RECORDS PURPOSES ONLY

August 19, 1997

Dr. Bob E. Wolfson Executive Director Old Dominion University Research Foundation Norfolk, VA 23529

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Subject: Space Act Agreement (SAA #409)—NASA Langley Research Center and the Old Dominion University/Old Dominion University Research Foundation

Enclosed are *triplicate* originals of the subject Space Act Agreement executed on behalf of NASA Langley Research Center.

Kindly execute this Agreement on behalf of the Old Dominion University/Old Dominion University Research Foundation, and return one of the originals to:

> NASA Langley Research Center Attn: Correspondence and Records Management Mail Stop 101 Hampton, VA 23681-0001

Thank you for your prompt attention.

Sammie D. Joplin Director Internal Operations Group

3 Enclosures

cc (w/Encl.): 101/C&RM 106/Staff Assistant 141/OCC 112/Director, IOG 118/J. A. C. Bartlett

118/Director, TAG 136/Chief, FMD 446/J. M. Inman 446/R. T. Layman 118/G. Bezos O'Connor 147/L. A. McAlhaney 377/J. W. Ward 104/A. C. Radford

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MEMORANDUM OF AGREEMENT BETWEEN NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, LANGLEY RESEARCH CENTER AND OLD DOMINION UNIVERSITY AND OLD DOMINION UNIVERSITY RESEARCH FOUNDATION CONCERNING OPERATION OF THE 30- BY 60-FOOT FULL-SCALE WIND TUNNEL LOCATED ON LANGLEY AIR FORCE BASE, VIRGINIA

<u>AUTHORITY</u>:

This Agreement is entered into by Old Dominion University of the Commonwealth of Virginia, (hereinafter referred to as "ODU"), the Old Dominion University Research Foundation (hereinafter referred to as "ODURF"), and the National Aeronautics and Space Administration, Langley Research Center (hereinafter referred to as "LaRC"). The legal authority for LaRC to enter into this Agreement is found in sections 205(c)(5) and (6) of the Space Act of 1958, as amended, 42 U.S.C. §2473(c). LaRC has constructed and operated the 30- by 60-foot full-scale wind tunnel facility (hereinafter referred to as "facility") under a permit from the U.S. Air Force Air Combat Command, 1st Fighter Wing (hereinafter referred to as "1st Fighter Wing"), No. DA-44-110-ENG-4299. The facility is located on Langley Air Force Base (hereinafter referred to as "LAFB") and is comprised of the 30- by 60-foot full-scale wind tunnel, office space, and shop space which occupy LaRC Building 643, along with supporting infrastructure. ODU has designated ODURF, a nonprofit 26 U.S.C. §501(c)(3) research organization, as its operating agent for purposes of this Agreement. Wherever ODU is obligated to perform under this Agreement, ODURF is similarly obligated, and wherever ODURF is obligated to perform under this Agreement, ODU is similarly obligated, excluding those references solely to ODURF in Article 14.

2. PURPOSE:

The purpose of this Agreement is to:

- 2.1 Provide for the use of Building 643 by ODU for the following specific purposes:
 - 2.1.1 Industrial Development
 - 2.1.2 University Research, and
 - 2.1.3 Education (including the exploration of degree programs in experimental aerospace engineering and instrumentation, and electronics and instrumentation technical programs in a possible partnership with Thomas Nelson Community College);
- 2.2 Provide a method for preserving the facility, a National Historic Landmark, by providing for its continued use by ODU, an educational institution, in accordance with the National Historic Preservation Act, as amended; and

2.3 Provide applicable procedures, requirements, and processes necessary for ODU to safely operate the wind tunnel and its support systems.

PERIOD:

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This Agreement shall be effective on the date signed by all signatories. The Agreement will be in effect for 10 years. At the expiration of the 10-year period, this Agreement will renew automatically on a 3-year basis unless terminated by any Party in accordance with the terms stated in this Agreement or by mutual consent of two or more Parties.

- 3.1 ODU/ODURF may, at its option, discontinue its operation of the wind tunnel facility on 90 days notice to NASA of its intent to do so. Upon exercise of its option to discontinue, it shall return possession of the facility on the ninetieth day, and its obligations under this Agreement shall cease, except those obligations identified in Article 20 as surviving the Agreement.
- 3.2 Use of the facility by ODU and ODURF is subject to the continued permission by the 1st Fighter Wing for the parties to use the facility pursuant to LaRC Permit Contract No. DA-44-110-ENG-4299, dated January 3, 1983, (attached) and any modifications thereto, which will remain in full force and effect for the duration of this Agreement.
- 3.3 The Agreement shall be jointly reviewed annually for reporting facility utilization and status.

<u>RESPONSIBILITIES</u>:

The responsibilities of the Parties involved are as follows:

- 4.1 ODURF, as operating agent for ODU, shall:
 - 4.1.1 Provide qualified personnel and staff to properly operate the facility to current LaRC standards and facility specific operating and safety procedures. ODURF shall be subject to all conditions for operating currently applicable to LaRC, as set forth in Permit No. DA-44-110-ENG-4299 and the Interservice Support Agreement between LaRC and the 1st Fighter Wing, as may be amended by LaRC and the 1st Fighter Wing. Specific operating and safety procedures are available over the Internet. The URL is "http://cmol." Log on name and passwords are "ODU".
 - 4.1.2 Maintain and repair the facility to include all equipment, components, systems and subsystems dedicated to the facility and used by ODURF, ODU, or their agents, guests, or contractors, including those not physically located within the facility. ODURF is responsible for the maintenance and repair of air, water, and sewage systems serving the facility. All repairs shall comply with applicable National, State, and local consensus codes and industrial standards. Maintenance shall not be required, however, to improve the air, water, and sewage systems beyond existing conditions.

- 4.1.3 Be responsible for the cost of electrical power to operate the facility. ODURF shall make payments for electrical power directly to Virginia Power.
 - 4.1.4 Comply with the following electrical power dispatch and safety requirements: The LaRC Power Dispatcher, or his authorized representative, may direct ODURF to terminate wind tunnel operations in the event of load shedding on peak power days or for any other conditions imposed by Virginia Power. ODURF shall coordinate with the LaRC Power Dispatcher for scheduling of all tunnel operations prior to each month of operation. ODURF shall be responsible for the maintenance, repair, or replacement of the circuit breakers dedicated to the facility. Maintenance of high voltage circuit breakers in the Back River substation must be coordinated with LaRC.
 - 4.1.5 Cease operations at any time, as directed by LaRC's Office of Safety, Environment, and Mission Assurance (hereinafter referred to as "OSEMA") if, in the reasonable exercise of their judgment, operations adversely impact the health or safety of LaRC, LAFB, or other personnel.
 - 4.1.6 Direct ODU employees and ODU/ODURF visitors, guests, contractors, and agents not to enter LaRC or LAFB facilities, other than Building 643, without the proper authorization from LaRC.
 - 4.1.7 Not bring hazardous waste onto the premises. ODU/ODURF shall accept responsibility for hazardous materials brought on the premises by ODU/ODURF employees, contractors, or visitors; hazardous waste generated as a result of ODU/ODURF's operations, and hazardous waste resulting from the disturbance of existing equipment, building components or grounds which pose no hazard if not disturbed. ODU/ODURF shall be responsible for the storage and disposal of this hazardous waste in accordance with all applicable Federal and State laws and regulations. Regulatory violations cited during this period resulting from ODU/ODURF's presence in this facility shall be the responsibility of ODU/ODURF, and it shall be ODU/ODURF's responsibility for remediation except to the extent that such regulatory violations cited are for conditions which existed prior to ODU/ODURF's presence in the facility, or were caused solely by LaRC or LAFB, or their employees, agents, or contractors.
- 4.1.8 Comply with all Federal, State, and Local environmental, safety and health laws and regulations as well as applicable LaRC, OSEMA policies, procedures, and guidelines. ODU/ODURF shall be responsible for all fines notice of violations (NOVs) and corrective actions caused in any part by ODU/ODURF's activity. ODURF shall obtain the required environmental permits related to the facility. ODURF shall notify LaRC immediately of any releases of hazardous materials, and ODURF shall be responsible for corrective actions. ODURF shall maintain inventories of all chemicals located at the facility and submit the applicable reports to LaRC and the Commonwealth of Virginia. Upon termination of the Agreement, ODURF shall conduct an environmental assessment of the facility, the scope of which is to be approved by LaRC.
- 4.1.9 Be the "employer" for purposes of complying with the Occupational Health and Safety Act of 1970, as amended. ODURF shall assure that its operations do not adversely affect the health or safety of LaRC or LAFB personnel.

- 4.1.10 Provide for its own security of the facility, including monitoring and response services. Re-key the facility, where appropriate and desirable, and provide LaRC, OSEMA, and 1st Fighter Wing Security with a single grand master key that operates all of the interior and exterior facility doors except those areas remaining under LaRC's control.
- 4.1.11 Prepare and maintain an emergency response and preparedness plan which must be approved by LaRC, OSEMA. This plan will include a designated point of contact in the event of a mishap or emergency, procedures to notify LaRC, and procedures to implement emergency actions requested by LaRC or the 1st Fighter Wing.
- 4.1.12 Maintain fire detection and suppression systems within Building 643. Any modifications to the systems must be approved by LaRC, OSEMA. A fire detection and suppression maintenance plan shall be submitted to LaRC and approved by LaRC, OSEMA. The fire detection and suppression maintenance plan shall include designated points of contact for notification when testing the alarm or suppression systems, a list of items to be checked, the frequency of checks, and procedures to ensure that corrective actions are implemented in a timely manner. ODURF shall conduct yearly fire safety compliance surveys and provide copies to LaRC, OSEMA. ODURF shall correct, in a timely manner, fire detection and suppression deficiencies identified by LaRC fire inspectors.
- 4.1.13 Abide by LaRC safety instructions in the event of adverse weather conditions. Depending on the emergency, such instructions may include sandbagging, deenergization of equipment, and reporting completed action to LaRC. Comply with LAFB access determinations in the event of adverse weather conditions, training exercises, or for National Defense reasons.
- 4.1.14 Provide its own source of heat and make arrangements for its own energy source since the 1st Fighter Wing plans to terminate the steam supply to LaRC's East Area facilities during 1998. The installation of any heating equipment and associated modification shall comply with applicable National, State and local consensus codes and industrial standards. Portable heaters shall not be used in the office or shop areas.
- 4.1.15 Be responsible for maintenance of the roof of Building 643. Maintenance shall not be required, however, to improve the roof beyond its current condition.
- 4.1.16 Maintain configuration management documentation for the facility and all related systems and operational configuration changes initiated by ODU/ODURF.
- 4.1.17 Conduct an annual inventory of all Government property on loan to ODU/ODURF every September. In October, an inventory report shall be submitted to LaRC containing the description, identification number, location, current use, and condition of such property. The report shall include a

statement validating any requirement to continue the loan. This annual report shall be submitted to the following LaRC point of contact:

Property Loan Officer Mail Stop 377 NASA Langley Research Center Hampton, VA 23681-0001

A beginning inventory shall be provided by LaRC, and a receipt for the property shall be provided by ODURF or ODU.

- 4.1.18 Coordinate base access and badging for ODU, ODURF, and their respective contractor personnel and guests with 1st Fighter Wing Security.
- 4.1.19 Be permitted to make internal facility modifications. Any modifications to the exterior of the facility shall be made only after obtaining approval from LaRC. All modifications shall be at ODURF's expense and shall comply with applicable National, State, and local consensus codes and industrial standards.
- 4.1.20 Shall NOT adjust any existing tunnel circuit flow straighteners that have been "red tagged" by NASA as non-operational.
- 4.2 LaRC shall:
 - 4.2.1 Provide ODU/ODURF in accordance with this Agreement, the use of the facility and all related equipment and systems existing at the facility as of the date of this Agreement.
 - 4.2.2 Provide all facility specific circuit flow and operational tunnel data that is not classified.
 - 4.2.3 Provide existing operating procedures through the LaRC Configuration Management On-Line System. This system is available on the Internet as indicated in Article 4, Subparagraph 4.1.1 above.
 - 4.2.4 Consider on a case-by-case basis the loan of research and operation equipment. LaRC shall execute and provide ODURF with a loan document identifying the loaned equipment and have an authorized agent of ODURF provide a receipt for the acceptance of the equipment.
 - 4.2.5 Provide use of existing telephone lines and data lines within Building 643 and those running from Building 1201 (Communications Facility) to Building 643. Use of LaRC-owned Rolm phone sets and local telephone service provided under the terms and conditions of paragraph 3 of Modification One to the Interim Agreement dated October 30, 1996, will continue until ODU has a private provider service in place or 6 months from the date of this Agreement, whichever occurs first. ODU shall not have access to LaRC's LaRCNET. Communications lines for fire and security alarms shall not be disconnected or altered by ODU for any purpose.

- 4.2.6 Allow ODURF to use the existing modular secure room 112B.
- 4.2.7 Monitor and respond to security alarms activated only from the areas identified in Article 9, paragraph 9.3, and only as long as LaRC has a presence in these areas. When LaRC vacates these areas, the installed security systems will be made available for ODURF's use.
- 4.2.8 Provide a baseline environmental assessment of the facility (attached).
- 4.2.9 Provide all services currently provided to LaRC under the existing Interservice Support Agreement with the 1st Fighter Wing without charge to ODURF, except as provided in §11.2, or as long as the Interservice Support Agreement is in effect. LaRC shall coordinate, subject to 1st Fighter Wing approval, the use of such services by ODU/ODURF.
- 4.2.10 Provide 125 pounds per square inch gauge (psig) service air (low pressure air) through the East Area central service air system, as long as this system is operated by LaRC, provided that ODURF shall coordinate any use of air for process purposes with the LaRC Air Dispatcher. LaRC may discontinue operation of the East Area central service air system (and by memo of June 26, 1997, ODURF was given 12 months notice of this intent). Unless the Parties agree otherwise, ODURF will have to purchase and install its own compressor, and make the necessary system modifications to provide its own source of low pressure air. If ODURF has a need to conduct tests that require an air pressure greater than 125 psig (high pressure air), ODURF may connect to LaRC's high pressure air system. In this event, ODU will be required to have any proposed high pressure air system modifications approved by LaRC's Facility Systems Engineering Division and have the existing piping system recertified in accordance with NASA Handbook (NHB) 1700.6, "Guide for Inservice Inspection of Ground-Based Pressure Vessels and Systems."
 - 4.2.11 Monitor fire alarm systems and coordinate fire dispatch with 1st Fighter Wing.
 - 4.2.12 Maintain the exterior structural integrity and corrosion control of exposed surfaces at a level determined by LaRC.

5. <u>HISTORIC PRESERVATION</u>:

Building 643 is an official National Historic Landmark (NHL) on the National Register of Historic Places. ODURF agrees to assume complete responsibility from the date of occupancy for historic cultural resource management under the National Historic Preservation Act of 1966 (NHPA), as amended, and its implementing regulations. ODURF is responsible for compliance with NHPA Section 106 requirements to consult with the Commonwealth of Virginia, Department of Historic Resources, State Historic Preservation Officer (SHPO), and the Advisory Council on Historic Preservation. A copy of such notifications and communications shall be sent to the Historic Preservation Officer at LaRC (Mail Stop 446). ODURF agrees to maintain and preserve clear and comprehensive records of such communications.

must obtain the required approvals from the Commonwealth of Virginia prior to commencing any internal facility modifications. LaRC assures full compliance with regard to all aspects of historic preservation up to the date of ODURF's occupancy.

6. "AS IS" PROVISION:

ODU acknowledges that the facility will be available for use "as is." All systems may not be operational.

7. USE OF THE FACILITY:

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The purpose of ODU's operation of the facility shall be for commercial testing of nonaerospace vehicles and structures, student instruction, and commercial testing of aerospace vehicles. Aerospace vehicle testing in the wind tunnel shall be only for the purposes of providing vehicle data reports to customers on the low angle-of-attack aerodynamics of aircraft or to test models too large for more conventional wind tunnels. It is a specific goal, and ODU intends to transition from testing predominately aerospace vehicles to primarily non-aerospace vehicles within a period of 3 years after the start date of this Agreement. Exceptions to this paragraph may be possible if it is determined by the NASA LaRC Director's review of individual requests to be in the interest of ODU/ODURF customer needs or LaRC.

PRIORITY OF USE:

LaRC currently has no plans for testing at Building 643. Should NASA have requirements to test, however, ODU and ODURF shall consider NASA's needs and the testing needs of the United States Department of Defense as highest priority for tunnel occupancy time. LaRC will compensate ODU/ODURF at ODU-established customer rates for LaRC sponsored testing. In the event of a National emergency or for National Defense purposes, NASA testing related to the emergency or National Defense needs shall displace all other ODU and ODURF uses.

ACCESS TO THE FACILITY:

- 9.1 ODU/ODURF shall not assign foreign nationals to Air Force property nor permit foreign nationals to enter the facility.
- 9.2 LaRC, OSEMA, shall have access to the facility at all times without having to obtain permission of ODU or ODURF for emergency and security response and for environmental, safety, security, and systems modification inspections. Such inspection shall be to reasonably ascertain that ODU/ODURF's activities will not adversely affect LaRC or LAFB facilities or personnel. Other NASA personnel requiring access to the facility shall obtain the permission of ODU or ODURF.
- 9.3 Rooms 122A, 122B, and 115; the area roped off in the northwest corner of room 101; and an area immediately outside room 122A are being used by LaRC and are scheduled to be vacated by September 30, 1997. Rooms 122E, 122F, and 122G are being used by LaRC. The schedule for moving these rooms and their contents will be determined by LaRC at a later date. Until these areas are vacated, LaRC personnel.

their contractors, and agents will be allowed access. ODU/ODURF will be provided notice of planned entries.

10. HAZARDOUS MATERIALS:

Asbestos floor tiles are present throughout Building 643, except in the restrooms and under the carpet in the hallways. The building is lined with cement asbestos panels. The appropriate Federal and State safety and environmental laws and regulations shall be followed should the asbestos be disturbed in any manner.

11. FINANCIAL OBLIGATIONS:

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- 11.1 NASA is not obligated to provide hands-on support or assistance relative to operations and maintenance of the facility and supporting infrastructure except as noted elsewhere in this Agreement.
- 11.2 ODU shall reimburse LaRC for steam used at the Building 643 complex. Based on previous consumption data, the cost of steam for the 1997/1998 heating season (October 1997 May 1998) is estimated to be \$18,000. These funds shall be paid in advance by check made payable to NASA Langley Research Center, Mail Stop 147, Hampton, VA 23681. The cost of ODU's steam consumption will be computed at the end of each calendar month, and ODU's account will be debited for the computed cost. Final adjustments will be made to the account at the time 1st Fighter Wing terminates steam supply to LaRC's East Area facilities, or when ODU has installed and made operational a source of heat for the Building 643 complex, whichever occurs first. Should there be a positive balance in the account at this time, the residuals will be returned to ODU. Should the total cost of steam used exceed the amount deposited, ODU shall provide a check for the full amount of additional funds required.
- 11.3 All LaRC activities under or pursuant to this Agreement are subject to the availability of appropriated funds, and no provision in this Agreement shall be interpreted to require obligation or payment of funds in violation of the Anti-Deficiency Act, 31 U.S.C. §1341.
- 11.4 LaRC's commitment of resources to accomplish the activities under the Agreement will not exceed resources valued at approximately \$12,000 per year. This amount is to be used for the provision of water, sewer, and high pressure air service to support wind tunnel operations by ODU.
- 11.5 If a Party to this Agreement is a state agency or derives its funds directly from state legislative appropriations and the state is limited by its constitution from committing future state legislative appropriations, then nothing herein shall constitute, or be deemed to constitute, an obligation of future obligations of the state.

12. DRUG-FREE WORKPLACE:

During the performance of this Agreement, the Parties shall be required to comply with the intent of the Drug-Free Workplace Act of 1988, 41 U.S.C. §701, et seq., which requires a drug-free workplace.

13. OFFICIALS NOT TO BENEFIT:

No member of or delegate to Congress, or resident commissioner, shall be admitted to any share or part of this Agreement, or to any benefit arising from it. However, this clause does not apply to this Agreement to the extent that this Agreement is made with a corporation for the corporation's general benefit.

14. LIABILITY AND RISK OF LOSS:

- 14.1 For purposes of this ARTICLE, the following definitions shall be applicable:
 - 14.1.1 "LIABILITY" shall include payments made pursuant to United States' treaty, any judgment by a court of competent jurisdiction, administrative and litigation costs, and settlement payments.
 - 14.1.2 "DAMAGE" shall mean bodily injury to, or other impairment of health of, or death of any person; damage to, loss of, or loss of use of any property; soil, surface water, ground water, or other environmental contamination or damage; loss of revenue or profits; other direct damages; or any indirect or consequential damage arising therefrom.

14.2 DAMAGE to Other Than the Government:

- 14.2.1 ODU/ODURF shall obtain or arrange to obtain, at no cost to LaRC, insurance protecting the U.S. Government and U.S. Government contractors and subcontractors, from any LIABILITY for DAMAGE, arising out of the performance of this Agreement, resulting in DAMAGE to:
 - 14.2.1.1 ODU/ODURF's employees or agents, parties in privity with ODU/ODURF, ODU/ODURF's customers, or their contractors or subcontractors, and
 - 14.2.1.2 Third parties, including U.S. Government employees, and U.S. Government contractor and subcontractor employees.

Insurance required under Subparagraph 14.2.1.1 above, may be satisfied through a LIABILITY insurance policy or policies under Subparagraph 14.2.1.2 above. Upon obtaining the insurance required under Subparagraph 14.2.1 above, or upon obtaining any modification or amendment thereof, ODU/ODURF shall personally deliver, or send by registered or certified mail, postage prepaid, two copies of such insurance, or such modification or amendment, to LaRC at the following address, or at such address as LaRC may from time to time designate in writing:

Attn: Chief Counsel; Mail Stop 141 NASA Langley Research Center Hampton, VA 23681-0001

- ODU/ODURF shall maintain insurance with terms and conditions as are 14.2.2. currently available in the market for reasonable insurance premiums, taking into account renewals, and shall provide insurance coverage of \$10,000,000 for general liability, and insurance coverage of \$10,000,000 for pollution liability. ODU/ODURF shall provide to LaRC certificates of insurance evidencing the insurance required thereunder within a reasonable time before ODU/ODURF begins to use Government property or Government services. Within 1 year of the signing date of this Agreement, ODURF shall provide an independent risk assessment, which shall include recommended dollar amounts for general and pollution liability insurance coverage. The risk assessment shall be performed by a qualified, mutually acceptable risk/insurance consultant, and the results of which shall be made available to LaRC or the U.S. Government without restriction. Within 6 months after this assessment, ODURF shall then adjust the amount of the general and pollution liability coverage to conform to the reasonable recommendations of the risk assessment and update the certificate(s) of insurance provided to LaRC. Unless ODU/ODURF provides evidence that such a condition in an insurance policy is not available at a reasonable premium, the insurance policy shall provide for the right of the U.S. Government to settle reasonably a claim after consultation with ODU/ODURF and its insurance underwriters. Claims made exclusively against the ODU/ODURF may only be settled or compromised in accordance with § 2.1-127, et seq. of the Code of Virginia.
- 14.2.3 ODU/ODURF's insurance obtained pursuant to Subparagraph 14.2.1 shall not be the exclusive recourse of the United States in the event LIABILITY exceeds the amount of coverage. The United States reserves the right to bring an action against any responsible party for LIABILITY incurred by the United States under domestic or international law.
- 14.2.4 Each Party agrees to cooperate with the other in obtaining any information, data, reports, contracts, and similar materials in connection with the presentation or defense of any claim by either Party under any policy of insurance purchased to meet the requirements of this Article.
- 14.2.5 ODU/ODURF shall be subject to NASA written policies, upon receipt of reasonable notice of said policies, with respect to access to and use of Government property provided by NASA to ODU/ODURF or NASA contractor or subcontractor property to the extent not expressly and specifically addressed in this Agreement.

14.3 Damage or Loss to Government Property:

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14.3.1 Notwithstanding the terms of Subparagraph 14.3.2, in the event that a portion of the facility or equipment wears out or is damaged to the extent that the facility becomes inoperable or unusable and cannot reasonably be repaired or replaced, the Parties may elect not to repair or replace the worn-out or damaged property, and the facility shall be returned to the possession of LaRC. In such a case, and to the extent attributable to ODU/ODURF's operation of the wind tunnel under this Agreement, ODURF shall place the facility in such a state of preservation, so that its subsequent deterioration will be no greater than had the facility been returned to the possession of LaRC immediately prior to such

wearing out or damage. If this condition includes deficiencies in health, structural integrity, or safety standards, then to the extent attributable to ODU/ODURF's operation of the wind tunnel under this Agreement, and if reasonable in view of the U.S. Government's plans for the facility, ODURF shall also make reasonable repairs to prevent the facility from posing an imminent hazard.

14.3.2 In addition to the insurance coverage required in Subparagraph 14.2.1 above, within a reasonable time before ODU/ODURF begins to have access to or use of U.S. Government property or services, ODU/ODURF shall obtain or arrange to obtain, at no cost to NASA, insurance to reimburse the U.S. Government for the costs of replacing or repairing, or the fair market value of, as reasonably determined by the U.S. Government, any U.S. Government property (real or personal) which is provided under this Agreement, which property is negligently DAMAGED by ODU/ODURF or their employees or agents. Upon obtaining the insurance required under this paragraph, or upon obtaining any modification or amendment thereof, ODU/ODURF shall personally deliver, or send by registered or certified mail, postage prepaid, two copies of such insurance, or such modification or amendment, to NASA at the following address, or at such address as NASA may from time to time designate in writing:

Attn: Chief Counsel; Mail Stop 141 NASA Langley Research Center Hampton, VA 23681-0001

- 14.3.3 To the extent permitted by law, the United States shall waive any claim for property damage in excess of the insurance required by this paragraph, 14.3.3.
- 14.3.4 In the event ODU/ODURF is unable to obtain insurance coverage required by Subparagraph 14.3.2 above, the Parties agree to consider, subject to review, approval and agreement by NASA, alternative methods of protecting U.S. Government property.
- 14.3.5 An insurance policy whose terms and conditions are reviewed and approved by NASA, or an agreement on an alternative method of protection is a condition precedent to ODU/ODURF's access to or use of U.S. Government property or U.S. Government services under this Agreement.

STATISTICS IN COMPLETE

14.4 <u>DAMAGE to ODU/ODURF and its Related Entities</u>: In order to assure that the U.S. Government is not exposed to any LIABILITY for DAMAGE as a result of making facilities and services available under this Agreement, to the extent permitted by law, ODU/ODURF waives all claims against the U.S. Government and its related entities (contractors, subcontractors, other customers and other customers' contractors or subcontractors) for any DAMAGE arising under this Agreement. In addition, ODU/ODURF agrees to require, by contract or otherwise, its related entities (employees, students, contractors, subcontractors, customers, users, and contractors and subcontractors of customers and users) to waive all claims against the U.S. Government and the U.S. Government's related entities for DAMAGES arising as a result of activities of this Agreement, whether or not the U.S. Government or its

contractors or subcontractors are negligent. In addition, ODU/ODURF shall arrange to obtain insurance, acceptable in terms and amount to NASA, to cover claims for DAMAGE to ODU/ODURF or its related entities.

- 14.5 The insurance required under Subparagraphs 14.2, 14.3, and 14.4 shall provide coverage in an amount acceptable to NASA.
 - 14.5.1 Such insurance shall name the United States as an insured *and* this Agreement as an insured contract, shall cover all risks of loss except that it may exclude DAMAGE caused by the U.S. Government's willful misconduct or reckless disregard. The insurance policy shall provide that the insurer waives its right as a subrogee against U.S. Government contractors or subcontractors for DAMAGE.
 - 14.5.2 ODURF shall pay for the deductible for Government claims against such insurance.
 - 14.5.3 In the event that both the U.S. Government and ODU/ODURF should claim against a single insurance policy required by this Article, then the U.S. Government shall have priority in the receipt of sums paid by the insurer to satisfy the claims.
 - 14.5.4 In the event that a claim against such insurance should create the reasonable probability that a subsequent claim would exhaust the coverage available for that insurance year, then ODU/ODURF may, within a reasonable time, purchase supplemental insurance satisfying the terms of this Article. Otherwise, and after consultation with ODU/ODURF, the U.S. Government shall have the option to terminate operations under this Agreement for the remainder of that insurance year.
- 14.6 Limitation of U.S. Government and ODU/ODURF Liability. To the extent that a risk of DAMAGE is not dealt with expressly in Paragraphs 14.2 through 14.4 of this Article, the U.S. Government's LIABILITY to ODU/ODURF, and ODU/ODURF's LIABILITY to the U.S. Government arising out of this Agreement, whether or not arising as a result of an alleged breach of this Agreement, shall be limited to direct DAMAGES only and shall not include any loss of revenue, profits, or other indirect or consequential DAMAGES. This limitation of LIABILITY shall not apply to indemnity for patent infringement claims as provided for in Paragraph 14.7 of this Article. LaRC shall not be liable for damages associated with tunnel downtime regardless of the cause.
- 14.7 Patent Infringement Claim:

No. States

14.7.1 ODU/ODURF's contractors shall indemnify the Government and its officers, agents, and employees against LIABILITY, including costs, for infringement of privately-owned U.S. patents to the extent that any such LIABILITY arises out of the use of products, processes, or articles of manufacture used in connection with the furnishing of the facilities and services to ODU/ODURF under provisions of this Agreement.

- 14.7.2 This indemnity shall not be the exclusive recourse of the United States. The United States reserves the right to bring an action against any responsible party for LIABILITY incurred by the United States under domestic or international law.
- 14.7.3 Each Party agrees to cooperate with the other in obtaining any information, data, reports, contacts, and similar materials in connection with the presentation or defense of any claim by either Party under any policy of insurance purchased to meet the requirements of this Article.

15. PROTECTION OF PROPRIETARY DATA:

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- 15.1 The Parties understand that proprietary information including test data owned by the Parties, their employees, agents, contractors, or customers (hereinafter "Subject Information") may be disclosed to the other Parties and/or their employees, agents, contractors, or customers. The Parties agree to use and agree to require their employees, agents, contractors, and customers to use reasonable care not to disclose Subject Information to a third party or to use Subject Information for any purpose without the prior written consent of the disclosing Party. The receiving Party shall not be liable for an accidental disclosure of the Subject Information provided reasonable care is used for protecting it during the term of this Agreement.
- 15.2 To the extent that either Party desires information disclosed to the other Party to be maintained in confidence, the disclosing Party shall so inform the other Party by placing on such information an appropriate and clearly legible notice, legend, stamp, marking, or other positive written identification that indicates such information is Subject Information. If any existing Subject Information is disclosed orally or visually by either Party, such oral or visual information shall be reduced to writing by the other Party and every page of such writing containing Subject Information shall be identified as above and then delivered to the other Party within thirty (30) days after the initial disclosure of said Subject Information, or there shall be no duty to maintain it in confidence.
- 15.3 A Party shall not be barred from using or disclosing Subject Information if it is in the public domain; is known to the receiving Party at time of disclosure; becomes known to the receiving Party without a similar restriction from a third party; or is released by disclosing Party to a third party without restriction. The Parties shall not be liable for the disclosure of Subject Information if the disclosure is made in response to an order of a court of competent jurisdiction, provided, however, that the receiving Party will first give notice to the disclosing Party before such disclosure so a protective order, if appropriate, may be sought by disclosing Party.

<u>TEST RESULTS</u>:

By participating in this Agreement, LaRC makes no representations or assurances to ODU or others as to the performance of the objects tested in LaRC facilities. The Agreement does not constitute LaRC's endorsement of any test results, resulting designs, hardware, or other matters.

17. ASSIGNMENT OF RIGHTS:

Neither this Agreement nor any interest arising under it may be assigned by the parties of this Agreement without the express written consent of the officials executing the Agreement.

18. KEY PERSONNEL:

The following personnel are designated as the key officials for this Agreement. These key officials are the principle points of contact in the performance of this Agreement. Any Party may change such address by giving written notice to the other Parties in the manner set forth in Article 18, Notices and Modifications, below.

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ODURF

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Gaudy Bezos-O'Connor Technology Applications Group Mail Stop 200 Hampton, VA 23681

Jerry Jones Administrator NASA, Langley Research Center Old Dominion University Research Foundation Norfolk, VA 23529

E. James Cross, Jr. Manager, Special Projects Office Old Dominion University Norfolk, VA 23529

19. NOTICES AND MODIFICATIONS:

- 19.1 Notices. All notices pertaining to this Agreement shall be in writing and signed by a signatory, and delivered by hand or sent by certified mail, return receipt requested, with postage prepaid to the address indicated in the Key Personnel Article for each Party.
- 19.2 Modifications. Any modification to this Agreement shall be executed in writing and signed by an authorized representative of each Party. Any modification which creates an additional commitment of LaRC resources must be signed by the original LaRC signatory authority or successor, or a higher level NASA official possessing original or delegated authority to make such a commitment.

20. TERMINATION OF AGREEMENT:

20.1 NASA's commitment under this Agreement to make available Government property and services required by ODU/ODURF may be terminated by LaRC, in whole or in part, (a) upon a declaration of war by the Congress of the United States, or (b) upon a declaration of a National emergency by the President of the United States, or (c) upon ODU/ODURF's failure to use the facility for the purposes stated in this Agreement, or (d) upon a NASA determination, in writing, that LaRC is required to terminate such services for reasons beyond its control. For purposes of this Article, reasons beyond LaRC's control are reasons which make impractical or impossible LaRC's or its contractors' or subcontractors' performance of this Agreement. Such reasons include, but are not limited to, Acts of God or of the public enemy; acts of the U.S. Government other than LaRC, in either its sovereign or contractual capacity (to include failure of Congress to appropriate sufficient funding, or the revocation of the Land-Use permit granted by the Air Force); fires; floods; epidemics; quarantine restrictions; strikes; freight embargoes; or unusually severe weather.

- 20.2 In the event of termination for reasons given above, NASA will seek to provide reasonable advance notice and will make reasonable efforts to mitigate the effect of such termination, and will enter into discussions with ODU/ODURF for that purpose. Mitigation includes, but is not limited to, the possibility of a later non-reimbursable agreement for the ODU/ODURF operation of the facility, whereby ODU/ODURF might recover its investment, at a time for which NASA determines that the circumstances which caused the termination under Article 20.1 have ceased.
- 20.3 NASA shall not be liable for any costs, loss of profits, revenue, or other direct, indirect, or consequential damages incurred by ODU/ODURF, its contractors, subcontractors, or customers as a result of the termination by NASA pursuant to Paragraph 20.1 of this Article.
- 20.4 ODU/ODURF shall have the right to terminate this Agreement at any time. In the event of such termination, ODU/ODURF shall be obligated to reimburse NASA for all Government costs which have been incurred up to the effective date of ODU/ODURF's notice of termination and are incurred as a result of such termination.
- 20.5 This Article is not intended to limit or govern the right of NASA or ODU/ODURF, in accordance with law, to terminate its performance under this Agreement, in whole or in part, for ODU/ODURF's or LaRC's breach of a provision in this Agreement.
- 20.6 In the event that the Agreement is terminated, the following paragraphs survive the Agreement: Article 14 and Article 4, Subparagraphs 4.1.7 and 4.1.8.

21. DISPUTES:

- 21.1 <u>Settlement</u>. Any dispute arising under this Agreement which cannot be readily resolved shall be submitted jointly to the signatories of this Agreement with each party agreeing to seek in good faith to resolve the issue through negotiation or other forms of non-binding alternative disputes resolution mutually agreeable to the Parties. A joint resolution of the signatories, or their designees, shall be the disposition of such dispute.
- 21.2 <u>Continuation of Work</u>: Pending the resolution of any dispute or claim pursuant to this Article, the Parties agree that performance of all obligations shall be pursued diligently in accordance with the terms of this Agreement.

22. APPLICABLE LAW:

ODU/ODURF and LaRC hereby designate the United States Federal law to govern this Agreement for all purposes, including, but not limited to, determining the validity of this Agreement, the meaning of its provisions, and the rights, obligations, and remedies of the Parties. To the extent Federal law does not cover the issues in controversy, substantive Virginia law shall pertain, but in no event does this provision subject LaRC to the jurisdiction of the Virginia courts.

23. SEVERABILITY:

The illegality or invalidity of any provisions in this Agreement shall not impair, affect, or invalidate the other provisions of this Agreement.

24. EXECUTION:

ALC: NO

Executed in Hampton, Virginia, by the Parties on the dates noted:

JEREMAH F. CREEDON

Director Langley Research Center National Aeronautics and Space Administration

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JAMES V. Косн President Old Dominion University of the Commonwealth of Virginia

Jor E. WOUS

BOB E. WOLFSON Executive Director Old Dominion University Research Foundation

Date 8/18/1887

Date \$/15/97

Date 15 August 1997

Attachments:

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- LaRC Permit Contract No. DA-44-110-ENG-4299, dated January 3, 1983
 Interservice Support Agreement #FB4800-87059-017, dated August 29, 1991
 Environmental Assessment, dated September 1996

APPENDIX B Consultation Letters and Correspondence

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National Aeronautics and Space Administration Langley Research Center Hampton, VA 23681-2199



uy to Atin of: 446

July 22, 2004

Dr. Ethel Eaton Director of Project Review Virginia Department of Historic Resources 2801 Kensington Avenue Richmond VA 23221

Subject: Demolition of Various Buildings and Infrastructure at NASA Langley Research Center, Hampton, Virginia

Ref: Programmatic Agreement Among NASA, the National Conference of State Historic Preservation Officers, and The Advisory Council on Historic Preservation

Dear Dr. Eaton,

1

The National Aeronautics and Space Administration (NASA) will be preparing a Programmatic Environmental Assessment (EA) for the proposed demolition of various buildings and infrastructure at NASA Langley Research Center (LaRC), located in Hampton, Virginia. The purpose of this letter is to provide you with some preliminary information regarding the proposed demolitions and to begin the consultation process to ensure NASA complies with applicable requirements of the NHPA. The proposed action would involve demolition of the following:

- 1. Building 640 (the 8-Foot Transonic Tunnel),
- 2. Building 641 (the 8-Foot High Speed Tunnel only), VDHR# 114-0139
- Building 1146 (the 16-Foot Transonic Tunnel only) and associated Buildings 1146A-C and 1146G-M.
- 4. Building 1212B (the 7 X 10-Foot Subsonic Tunnel Circuit only),
- 5. Building 1297 (the Gantry), VDHR# 114-0140 and associated Buildings 1297A-G,
- 6. Building 643 (the 30 X 60 Foot Full Scale Tunnel), VDHR# 114-0142.

Buildings 641, 643, and 1297 (the Gantry) are National Historic Landmarks (NHL's); are listed on the National Register of Historic Places; and are part of the Programmatic Agreement (PA) referenced above. Buildings 640, 641, and 643 are located on LaRC's East Side on Langley Air Force Base (LAFB) property, and are within a proposed Langley Air Field Historic District. Buildings 640 and 1146 may be potentially eligible for listing as National Historic Landmarks, and the Building 1212B Tunnel is over 50 years of age.

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In the Programmatic EA, NASA plans to evaluate the proposed action, the no-action alternative, and one alternative each for the three NHL's and for Building 1146. In addition to preparing the Programmatic EA, NASA intends to comply with the PA and Section 106 requirements of the NHPA by preparing HABS/HAER documentation for the three NHL's. Enclosed for your review is the PA, the Virginia Department of Historical Resources Project Review Forms for each of the buildings identified for demolition, and maps showing the location of the NHL's. Also included are photographs of the respective buildings, along with neighboring facilities (both NASA and LAFB) that are at least 50 years of age.

Below are the numbers to reference for the HAER documentation in your files:

8 ft. high speed tunnel (Bldg. 641) - Survey # HAER VA-118-B 8 ft. transonic tunnel (Bldg. 640) - Survey # HAER VA-118-D Full Scale Tunnel (Bldg. 643) - Survey # HAER VA-118-A

We would like to schedule a meeting with your department to review the requirements in the PA and to discuss the best procedures for the remaining structures. We could either meet at your offices in Richmond or at NASA LaRC if you would like to schedule a field visit of the structures to be impacted.

Please contact me with any questions and or comments.

Rodney T. Harris Master Planner, Integrated Asset Management Team

Phone: 757-864-6118 Fax: 757-864-8096 E-mail: rodney.t.harris@larc.nasa.gov

Enclosures

National Aeronautics and Space Administration Langley Research Center Hampton, VA 23681-2199



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August 4, 2004

Advisory Council on Historic Preservation Mr. Thomas McCulloch Historic Preservation Specialist 1100 Pennsylvania Ave., NW, Ste. 803 Washington, DC 20004

- Subject: Demolition of Various Buildings and Infrastructure at NASA Langley Research Center, Hampton, Virginia
- Ref: Programmatic Agreement Among NASA, the National Conference of State Historic Preservation Officers, and The Advisory Council on Historic Preservation
- Dear Mr. McCulloch,

The National Aeronautics and Space Administration (NASA) will be preparing a Programmatic Environmental Assessment (EA) for the proposed demolition of various buildings and infrastructure at NASA Langley Research Center (LaRC), located in Hampton, Virginia. The purpose of this letter is to provide you with some preliminary information regarding the proposed demolitions and to begin the consultation process to ensure NASA complies with applicable requirements of the NHPA. The proposed action would involve demolition of the following:

- 1. Building 640 (the 8-Foot Transonic Tunnel),
- 2. Building 641 (the 8-Foot High Speed Tunnel only), VDHR# 114-0139
- 3. Building 1146 (the 16-Foot Transonic Tunnel only) and associated Buildings 1146A-
- 4. C and 1146G-M,
- 5. Building 1212B (the 7 X 10-Foot Subsonic Tunnel Circuit only),
- 6. Building 1297 (the Gantry), VDHR# 114-0140 and associated Buildings 1297A-G,
- 7. Building 643 (the 30 X 60 Foot Full Scale Tunnel), VDHR# 114-0142.

Buildings 641, 643, and 1297 (the Gantry) are National Historic Landmarks (NHL's); are listed on the National Register of Historic Places; and are part of the Programmatic Agreement (PA) referenced above. Buildings 640, 641, and 643 are located on LaRC's East Side on Langley Air Force Base (LAFB) property, and are within a proposed Langley Air Field Historic District. Buildings 640 and 1146 may be potentially eligible for listing as National Historic Landmarks, and the Building 1212B Tunnel is over 50 years of age.

In the Programmatic EA, NASA plans to evaluate the proposed action, the no-action alternative, and one alternative each for the three NHL's and for Building 1146. In addition to preparing the Programmatic EA, NASA intends to comply with the PA and Section 106 requirements of the NHPA by preparing HABS/HAER documentation for the three NHL's. Enclosed for your review is the PA, the Virginia Department of Historical Resources Project Review Forms for each of the buildings identified for demolition, and maps showing the location of the NHL's. Also included are photographs of the respective buildings, along with neighboring facilities (both NASA and LAFB) that are at least 50 years of age.

Below are the numbers to reference for the HAER documentation in your files:

8 ft. high speed tunnel (Bldg. 641) - Survey # HAER VA-118-B 8 ft. transonic tunnel (Bldg. 640) - Survey # HAER VA-118-D Full Scale Tunnel (Bldg. 643) - Survey # HAER VA-118-A

We have forwarded an identical package to Dr. Ethel Eaton, Director of Project Review for the Virginia Department of Historic Resources in Richmond.

We would like to schedule a meeting with the Council to review the requirements in the PA and to discuss the best procedures for the remaining structures. We could either meet at your offices in Washington, DC or at NASA LaRC if you would like to schedule a field visit of the structures to be impacted.

Please contact me with any questions and or comments.

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Rodney T. Harris Master Planner, Integrated Asset Management Team

Phone: 757-864-6118 Fax: 757-864-8096 E-mail: rodney.t.harris@larc.nasa.gov

Enclosures

National Aeronautics and Space Administration

Langley Research Center Hampton, VA 23681-2199



August 6, 2004

Reply to Attn of: 418

City of Hampton Attn: Mr. George Wallace City Manager 22 Lincoln Street Hampton, VA 23662

SUBJECT: Compliance with the National Environmental Policy Act (NEPA) and Section 106 of the National Historic Preservation Act (NHPA)

In accordance with National Aeronautics and Space Administration (NASA) policies (14 CFR 1216.1 and 1216.3) and the requirements of the NEPA (42 U.S.C. 4321 *et seq.*), NASA will be preparing a Programmatic Environmental Assessment (EA) for the proposed demolition of various buildings and infrastructure at NASA Langley Research Center (LaRC), located in Hampton, Virginia. The proposed action would involve demolition of the following:

- 1. Building 640 (the 8-Foot Transonic Tunnel);
- 2. Building 641 (the 8-Foot High Speed Tunnel only);
- Building 1146 (the 16-Foot Transonic Tunnel only) and associated Buildings 1146A-C and 1146G-M;
- 4. Building 1212B (the 7 X 10-Foot Subsonic Tunnel Circuit only);
- 5. Building 1297 (the Gantry) and associated Buildings 1297A-G; and
- 6. Building 643 (the 30 X 60 Foot Full Scale Tunnel).

Buildings 641, 643, and 1297 (the Gantry) are National Historic Landmarks (NHLs); are listed on the National Register of Historic Places; and are part of a Programmatic Agreement between NASA, the National Conference of State Historic Preservation Officers, and the Advisory Council on Historic Preservation. Buildings 640, 641, and 643 are located on LaRC's East Side on Langley Air Force Base property, and are within the proposed Langley Field Historic District. Building 640 and the Building 1146 Tunnel are potentially eligible for listing as National Historic Landmarks and the Building 1212B Tunnel is over 50 years of age.

In addition to the proposed action and the no-action alternative, the EA will include an analysis of one alternative each for the three NHLs and Building 1146. NASA intends to comply with the Programmatic Agreement and Section 106 of the NHPA by preparing Historic American

Buildings Survey (HABS) and Historic American Engineering Record (HAER) for each of the buildings. Upon completion, NASA will submit the HABS/HAER documents to the Library of Congress and the Virginia State Historic Preservation Office to ensure proper archiving.

NASA has begun the consultation process with the Virginia State Historic Preservation Office and the Advisory Council on Historic Preservation regarding the proposed demolitions.

In accordance with NEPA and NHPA requirements, NASA is eliciting any comments regarding environmental and cultural issues associated with the proposed project. All comments and suggestions must be received in writing by September 17, 2004, to be considered by NASA in the EA. NASA plans to make the draft EA available for public comment in the spring of 2005. Comments and suggestions should be sent to:

NASA LaRC Environmental Management Office Attn: Mr. Jan Benson MS 418 Hampton, VA 23681-2199 Email: jan.a.benson@nasa.gov Facsimile: 757-864-2414

Cordially,

Jan A. Benson

Environmental Engineer Environmental Management Office

Identical Letter to:

City of Newport News Attn: Mr. Randall W. Hildebrandt Assistant City Manager 2400 Washington Avenue Newport News, VA 23607

City of Poquoson Attn: Mr. Charles W. Burgess, Jr. City Manager 500 City Hall Avenue Poquoson, VA 23662

Council on Environmental Quality The Honorable James L. Connaughton Chair, Council on Environmental Quality Executive Office of the President Washington, D.C. 20006 City of Williamsburg Attn: Mr. Jackson Tuttle City Manager 401 Lafayette Street Williamsburg, VA 23185

Hampton Roads Planning District Commission Attn: Mr. Arthur L. Collins Executive Director The Regional Building 723 Woodlake Drive Chesapeake, VA 23320

York County Attn: Mr. James O. McReynolds County Administrator P.O. Box 532 Yorktown, VA 23690-0532

LaRC Letter to City Manager, Jan A. Benson, dated August 6, 2004

Identical Letter to (continuation): Virginia Department of Environmental Quality Attn: Ms. Ellie Irons Office of Environmental Impact Review P.O. Box 10009 Richmond, VA 23240

James City County Attn: Mr. Sanford B. Wanner County Administrator 101C Mounts Bay Road Williamsburg, VA 23185-6569

Langley Air Force Base Attn: Mr. Thomas Wittkamp EIAP Manager 37 Sweeney Blvd., Bldg. 328 Langley AFB, VA 23665-2170

National Park Service Attn: Dr. John H. Sprinkle, Jr. National Historic Landmarks Program 1849 C Street NW (2280) Washington, D.C. 20240

U.S. Environmental Protection Agency Attn: Mr. William Arguto Environmental Review Coordinator 1650 Arch Street, EA-30 Philadelphia, PA 19106

Virginia Air and Space Museum Attn: Mr. Todd C. Bridgford Executive Director 600 Settlers Landing Road Hampton, VA 23669 Virginia Historical Society Attn: Mr. Charles F. Bryan, Jr. President P.O. Box 7311 Richmond, VA 23221-0311

Smithsonian National Air and Space Center Attn: Dr. Peter Jakab Chairmen of Aeronautics Division P.O. Box 37012 Washington, D.C. 20013-7012

Smithsonian National Air and Space Center Attn: Dr. Roger Launius Chairmen of Space History Division P. O. Box 37012 Washington, D.C. 20013-7012

ec: 101/CRM 421/OSSEMA 418/EMO 418/J. Benson 477/C. Diehl

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August 17, 2004

Mr. Rodney T. Harris Master Planner Integrated Asset Management Team at Langley Langley Research Center Hampton, VA 23681-2199

REF: Proposed removal of the Eight-Foot High Speed Wind Tunnel, the 30- by 60-Foot Wind Tunnel, and the Lunar Landing Research Facility

Dear Mr. Harris:

We have received your letter notifying the ACHP of NASA's intention to prepare an Environmental Assessment for the adverse effects of the proposed demolition of the three referenced National Historic Landmark (NHL) properties and other facilities within a proposed historic district at the Langley Research Center. In accordance with 36 CFR 800.6(a)(1) of the Council's regulations, "Protection of Historic Properties," the Council has applied the *Criteria for Council Involvement in Reviewing Individual Section 106 Cases* (Appendix A) and believes these are met. As required by Section 800.6(a)(1)(iii) of our regulations, we have notified the Administrator of NASA of our decision to participate in the consultation process, and its basis.

We look forward to consulting with you and the Virginia State Historic Preservation Officer to address the adverse effects of the proposed demolition of these historic facilities.

If you have any questions, do not hesitate to contact Dr. Tom McCulloch at 202-606-\$554 or via e-mail at tunculloch@achp.gov.

Difference Office of Federal Agency Programs

ADVISORY COUNCIL ON HISTORIC PRESERVATION

1100 Pennsylvania Avenue NW, Suite 809 • Washington, DC 20004 Phone: 202-606-8503 • Fax: 202-606-8647 • achp@achp.gov • www.achp.gov

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Sincerely.

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John L. Nau, III Chairman

Bernadette Castro Vice Chairman

John M. Fowler Executive Director



Preserving America's Horitaga

August 18, 2004

Honorable Sean O'Keefe Administrator National Aeronautics and Space Administration Two Independence Square 300 E Street SW Washington DC 20546

NUNE

Dear Administrator O'Keefe:

We have received documentation from NASA's Langley Research Center on its intention to prepare an Environmental Assessment for the proposed demolition of three National Historic Landmark (NHL) properties. These historic facilities are the Eight-Foot High Speed Wind Tunnel, the 30- by 60-Foot Wind Tunnel, and the Lunar Landing Research Facility. Other facilities scheduled for demolition lie within a proposed historic district. The wind tunnels and Lunar Landing facility were designated NHLs by the Secretary of the Interior in 1985 for their contribution to the success of America's manned space program.

We are notifying you that the ACHP will participate in consultation pursuant to Section 800.6(a)(1)(iii) of its regulations ("Protection of Historic Properties," 36 CFR Part 800) and the 1989 Programmatic Agreement among NASA, the ACHP, and the National Conference of State Historic Preservation Officers to assist NASA in meeting the requirements of Sections 106 and 110(f) of the National Historic Preservation Act for this undertaking.

A copy of our letter to Mr. Rodney T. Harris, Master Planner for the Integrated Asset Management Team at Langley, notifying him of our intention to participate in consultation is enclosed. If you or your staff have questions, do not hesitate to call me at 202-606-8505.

Sincer d. Fowler Executive Director Enclosure

ADVISORY COUNCIL ON HISTORIC PRESERVATION

1100 Pennsylvania Avenue NW, Suite 809 + Washington, DC 20004 Phone: 202.606-8503 + Fax: 202.606-8647 + achp@achp.gov + www.achp.gov MAG



COMMONWEALTH of VIRGINIA

Department of Historic Resources 2801 Kensington Avenue, Richmond, Virginia 23221

W. Tayloe Murphy, Jr. Secretary of Natural Resources

Kathleen S. Kilpatrick Director

Tel: (804) 367-2323 Fax: (804) 367-2391

TDD: (804) 367-2386 www.dhr.state.va.us

22 October 2004

Rodney T. Harris, Master Planner Capital Investment Planning Office Mail Stop 446 Langley Research Center Hampton, Virginia 23681-2199

Re: NASA Langley Research Center Demolition initiative and New Town project – DHR File Number 2002-1560 Draft Cultural Resource Management Plan (CRMP) - DHR File Number 1999-0421 Programmatic agreement for routine activities Hampton, VA

Dear Mr. Harris,

Thank you for meeting with staff from the Virginia Department of Historic Resources (DHR) in August to discuss NASA's proposal to remove several facilities from the NASA Langley Research Center (LaRC), including the following:

Building 640 - 8-ft. Transonic Tunnel

Building 641 - 8-ft. High Speed Tunnel (tunnel only) - DHR no. 114-0139

Building 1146 - 16-ft. Transonic Tunnel (tunnel only) and associated buildings 1146A-C and 1146G-M

Building 1212B - Gantry (Lunar Landing Research Facility) - DHR no. 114-0140, and associated buildings 1297A-G

Building 643 - 30 X 60 ft. Full Scale Tunnel - DHR no. 114-0142

Your letter of 22 July outlining this initiative notes that buildings 641, 1212B, and 643 are National Historic Landmarks, and that buildings 640, 641, and 643 are within LaRC's East Side, on Langley Air Force Base (LAFB) property, and within the proposed Langley Air Field Historic District. Further, your letter notes that buildings 640 and 1146 may be potentially eligible for listing as National Historic Landmarks, and that building 1212B is over 50 years of age.

During the meeting, preliminary information was also provided on the New Town project, and the project area was investigated. Also, you expressed interest in conducting an installation wide survey of cultural resources, and exploring the possibility of setting up a programmatic agreement for management of the cultural resources at LaRC. Since the meeting, NASA provided DHR with a copy of the NASA Langley Research Center Draft Cultural Resource Management Plan (CRMP).

iministrative Services .0 Courthouse Avenue Petersburg, VA 23803 Tel: (804) 863-1624 Fax: (804) 862-6196 Capital Region Office 2501 Kensington Ave. Richmond, VA 23221 Tel: (804) 367-2323 Fax: (804) 367-2391 Portsmouth Region Office 612 Court Street, 3rd Floor Portsmouth, VA 23704 Tel: (757) 396-6707 Fax: (757) 396-6712 Roanoke Region Office 1030 Penmar Ave., SE Roanoke, VA 24013 Tel: (540) 857-7585 Fax: (540) 857-7588

Winchester Region Office 107 N. Kent Street, Suite 203 Winchester, VA 22601 Tel: (540) 722-3427 Fax: (540) 722-7535 NASA Langley Research Center

. Demolition initiative and New Town project

Draft Cultural Resource Management Plan (CRMP) - DHR File Number 1999-0421 Programmatic agreement for coutine activities Hampton, VA

DHR would like to offer comments concerning the proposed demolition initiative, the New Town development, on the CRMP, and the development of a programmatic agreement.

Demolition initiative and New Town project:

From discussions at the August meeting with you and other NASA staff and consultants, DHR understands that alternatives to demolition are being explored by NASA for two of the wind tunnels, as is required by the Section 106 regulations set forth in the National Historic Preservation Act of 1966, as amended. One of the alternatives is continued use, currently in place with Old Dominion University and NASCAR; the cost of rehabilitation and repair for another tunnel is being considered. Also, according to the Programmatic Agreement Among the National Aeronautics and Space Administration, the National Conference of State Historic Preservation Officers, and the Advisory Council on Historic Preservation, executed in 1989, which addresses the National Historic Landmark facilities, "NASA will apply its agreement with the Smithsonian Institution (NASA Management Instruction 4310.4) to determine appropriate retention and curation activities with respect to significant artifacts." DHR understands from discussions during the meeting that NASA is exploring opportunities for transfer of some of the resources, or their components. DHR looks forward to ongoing consultation with NASA concerning this initiative as plans develop. As NASA moves forward with this initiative, please make sure that the Advisory Council on Historic Preservation (ACHP) has been notified by formal letter of the initiative, and has been invited to participate in consultation. It is also advisable to contact the U.S. Department of the Interior, due to the potential for an adverse effect on NHL resources at LaRC. Also, DHR will plan to continue consultation with NASA concerning the New Town project as it moves forward.

Programmatic agreement:

To clarify the potential impact of the New Town project, DHR recommends that NASA consider carrying out an installation wide survey and assessment of properties that have not yet been documented and evaluated, but may meet the National Register Criteria. This would also provide base level information for the development of a programmatic agreement (PA). As discussed at the August meeting, at a minimum, a programmatic agreement can address routine actions that can be exempt from Section 106 review, as they would not result in an adverse effect on historic properties. In addition, with knowledge of resources at LaRC, a PA can cover a broader range of treatments, and allow NASA to take more responsibility for cultural resources management. This can result in fewer routine consultations with DHR, streamlining the consultation process for both DHR and NASA. As an example, the Navy Command, Naval Region Mid-Atlantic PA was discussed at the meeting and an electronic version was sent to you for consideration. If you have questions about this agreement, DHR would be happy to address them.

A PA to cover routine actions would include a list of treatments that can be exempt from review. The CRMP has a list of no effect activities, which DHR considered as the basis for a list of exempt activities. Concerning archaeological resources, DHR offers the following comments on the list:

Items 1-4 - These activities must avoid additional ground disturbance as well. This also applies to items 20 (replacement of sidewalks), 23 (replacement of foundations, etc) and 24 (construction of roads). Additional ground disturbance should require consultation with the FPO.
NASA Langley Research Center Demolition initiative and New Town project Draft Cultural Resource Management Plan (CRMP) - DHR File Number 1999-0421 Programmatic agreement for routine activities Hampton, VA

Item 5 - (replacement of trees, etc) - This is acceptable in areas of low/no probability for archaeological deposits. In moderate/high probability areas leaving the root balls in place is recommended, as is testing in any areas where new plantings will be placed. This activity should be coordinated with the FPO.

Item 25 (staging areas) - This is acceptable in low/no probability areas. In moderate/high probability areas, or in areas of known archaeological significance, this activity should be avoided if possible (staging of heavy equipment can compact soils and damage subsurface deposits). If avoidance is not possible, consultation with the FPO is recommended.

For architectural and landscape resources, the list of no effect activities is suitable for a list of exempt activities, and can be expanded to consider other treatments, in consultation with DHR.

DHR looks forward to consulting further with you regarding the development of a PA. Please contact the ACHP by formal letter regarding NASA's intention to develop a PA, and invite the ACHP to participate in consultation. It is also advisable to contact the U.S. Department of the Interior, due to the presence of NHL resources at LaRC.

CRMP:

The CRMP was prepared for NASA by Gray and Pape, Inc., Richmond, Virginia. The CRMP's Executive Summary states that the goals of the CRMP are to "provide guidelines and information that will facilitate the historic preservation process at the LaRC [Langley Research Center]." The CRMP was prepared in response to obligations of federal agencies to their cultural resources, established by Section 106 and Section 110 of the National Historic Preservation Act of 1966, as amended (NHPA).

The draft CRMP is a thorough document that meets the intended objectives. DHR staff has reviewed the document, and offers the following suggested revisions to make application of the guidance in the document more effective:

- Executive Summary Page 1 and following: abbreviation for Langley Research Center initially given as LaRC, then on page 2 and following, as LRC. One abbreviation should be used consistently.
- Executive Summary Page 3: a comprehensive survey of resources has not been completed; this should be done to identify historic properties for appropriate treatment according to the guidance provided by the CRMP, as noted on page 49 of the CRMP.
- Executive Summary Page 4: reference to the Secretary of the Interior's guidelines and standards should include correct name.
- Index provided with the user's guide is a useful tool.
- · Page 3, 3rd paragraph: "Follow" should be "following".
- Page 3, bullet points: Clarify "undertaking" using language from regulations, rather than "will it effect cultural resources".
- Page 3, 4th paragraph: Clarify function of Section 106 more precisely.
- Page 4, 4th paragraph: Was CRMP integrated into the LaRC Master Facilities Plan?
- Page 6 and following: The association between the Air Force Base and the Research Center is not explained. As part of LaRC overview, relate history to that of Langley Air Force base, and make clear the physical interconnection of the two installations.

3

NASA Langley Research Center Demolition initiative and New Town project Draft Cultural Resource Management Plan (CRMP) - DHR File Number 1999-0421 Programmatic agreement for routine activities Hampton, VA

- Page 8, 1st and 2nd paragraphs: Table 1 and Table 3 are embedded in the text rather than Appendix D as noted. Again, a comprehensive survey of resources has not been done; this information is needed for effective application of the guidance in the CRMP.
- Page 8, 4th paragraph: Clarify the information provided here, as only seven cultural resources identified on LaRC property were evaluated for National Register eligibility. Also, we remind you that consultation with the SHPO is necessary for all undertakings, not just those that may affect National Register listed or National Historic Landmark properties, unless categorically excluded under agreement with this office.
 Page 15: Tables 2 and 3 are embedded in the table.
- Page 15: Tables 2 and 3 are embedded in the text rather than in Appendix D as noted.
- Page 16, 2nd paragraph: Will LaRC consider all properties 50 years of age and over "historic properties" according to the NHPA, until evaluation of these properties can be performed? As noted above, and noted on page 49 of the CRMP, documentation and evaluation of all properties, including those less than 50 years of age, should be completed as these properties may meet National Register Criteria Consideration G for association with space program developments within the past 50 years.
- Page 20 and following: The Section 106 regulations have been revised since this draft
 was completed in 1995. We recommend that you update the CRMP to reflect these
 revisions (including the emphasis upon public participation as well as consultation with
 other interested parties including Native American tribes during all steps of the 106
 process).
- Page 23: An adverse effect is not necessarily "harm", but is rather an alteration of the characteristics of a property that render it eligible for the National Register. 36CFR800.5(1) has language that may be cited in this instance. Also, please clarify that adverse effects may be avoided, minimized, or mitigated, not made "less harmful."
- Page 24 and following: Provide appropriate citations for National Register of Historic Places documents and regulations. Also, it would be useful to reference and include National Register Criteria Considerations, perhaps as an appendix including the full text of the Criteria for Evaluation, Criteria Considerations, and explanation of integrity.
- Page 24, 1st paragraph: Clarify the distinction between, and differences in treatment of, National Register listed properties and properties that are designated National Historic Landmarks. In line 7 the term "National Register" should be replaced by "Section 106 regulations".
- Page 24, 2nd paragraph: Clearly state that only one of the National Register Criteria needs to be met for a property to be considered eligible; as worded it appears that all Criteria must be met.
- Page 25, 1st paragraph: Citation should be 36CFR800.4(a)(1).
- Page 25, 2nd paragraph: 36CFR800.9 is not applicable. Note that 36 CFR Part 800.16(i) provides the definition of "effect", which can be quoted or referenced here.
- Page 28, 4th paragraph: As noted above, an adverse effect cannot be reduced.
- Page 29, 2nd paragraph: Painting need not be considered a repair action that has the
 potential to affect a historic property. Painting of surfaces historically painted, when
 preparation and painting procedures are not invasive or likely to cause any damage to
 historic fabric (such as by sandblasting, high power washing, etc.), may be considered an
 activity that does not have the potential to cause an effect.
- Pages 41-42: Modify to reflect Section 106 regulations the "transfer, lease, or sale of
 property out of Federal ownership or control without adequate and legally enforceable
 restrictions or conditions to ensure long term preservation of the property's historic
 significance" is considered an adverse effect.

4

NASA Langley Research Center

Demolition initiative and New Town project

Draft Cultural Resource Management Plan (CRMP) - DHR File Number 1999-0421 Programmatic agreement for routine activities Hampton, VA

- Pages 45-46: Removal of dead/diseased trees may result in damage to archaeological resources. Trees in known sites or unsurveyed areas should be removed at the ground surface and the root ball left in place when possible.
- Page 46, 11th bullet point: "Repair" should read "Replacement".
- Page 50: Federal curation standards apply both to artifacts and to the documents (field notes, reports, photographs, etc) that accompany them.
- Page 51-52: Inclusion of public outreach programs recognizes an important aspect of cultural resource management and NHPA compliance as well.
- Page 53: Recognition of survey of undocumented areas and resources as the first cultural resource management priority is appropriate. Text should indicate that the referenced maps are contained in Appendix A.

General comments:

- Clarify use of the terms "cultural resources", "historic resources", and "historic properties" throughout the text, according to the meaning of these terms in the NHPA Section 106 and Section 1110 regulations.
- Correct text to reflect current NHPA Section 106 regulations.
- Make reference to useful websites wherever appropriate in the text, including the site for the Advisory Council on Historic Preservation, the National Park Service sites regarding the National Register of Historic Places criteria and their application, the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes, and the Preservation Briefs and their application, and any applicable sites related to NASA programs, cultural resource operations and compliance for the DoD that may apply to NASA or NASA property at Langley Air Force Base, etc.
- Clarify the role of the "Preservation Officer" referred to in sections of the document. This individual should meet the Secretary of the Interior's Professional Qualifications Standards, which should be set forth in the CRMP. Also, if possible, the Preservation Officer should manage and direct the cultural resources management efforts outlined in the CRMP. Please use consistent name or abbreviation throughout the document to reference the Preservation Officer (in the exempt activities list the reference is to "FPO").
- Any future surveys should include analysis of cultural landscapes, and a cultural landscapes study should be done as part of the planned cultural resources identification survey.

The Advisory Council on Historic Preservation (ACHP) should be given the opportunity to review the ICRMP if they have not already done so. Please provide DHR with copies of correspondence with the ACHP concerning the CRMP,

Thank you again for requesting our comments. If you have any questions regarding these comments or if we can be of any further assistance, please contact Joanna Wilson at (804) 367-2323 ext. 140, or <u>Joanna Wilson@dhr.virginia.gov</u>, or Ethel Eaton at <u>Ethel.Eaton@dhr.virginia.gov</u>, or (804) 367-2323 ext. 112.

NASA Langley Research Center Demolition initiative and New Town project Draft Cultural Resource Management Plan (CRMP) - DHR File Number 1999-0421 - Programmatic agreement for routine activities Hampton, VA

Sincerely,

Susan E. Smead

Architectural Historian/Historian and Preservationist III



January 31, 2005

watnat 300

Mr. Thomas McCulloch Historic Preservation Specialist Advisory Council on Historic Preservation (ACHP) 1100 Pennsylvania Ave., NW, Ste. 803 Washington, DC 20004

Dear Mr. McCulloch,

Thank you for accepting our invitation to participate in the Proposed Facility Demolition Consultation Meeting at NASA Langley Research Center (LaRC) on February 10, 2005, at 9:30 a.m. Enclosed for your review, is background information to include the Programmatic Agreement between NASA, the NCSHPO and the ACHP, NASA's Procedural Requirements for Identification and Disposition of NASA Artifacts, and photographs, histories, floor plans and maps of the facilities. Also enclosed are the meeting agenda, directions to NASA LaRC, and information on local hotels.

A NASA representative will meet you at the main gate Badge and Pass Office to escort you to the meeting location. We look forward to meeting with you regarding this project. Please feel free to contact me at 757-864-6118, should you have any questions or concerns.

Respectfully,

Rodney T. Harris Center Master Planner Facility Preservation Officer NASA Langley Research Center Integrated Assets Management Services Rodney.T.Harris@Nasa.Gov



January 31, 2005

to Atta or 300

Mr. William Bolger Architectural Historian National Park Service 200 Chestnut Street Philadelphia, PA 19106

Dear Mr. Bolger,

Thank you for accepting our invitation to participate in the Proposed Facility Demolition Consultation Meeting at NASA Langley Research Center (LaRC) on February 10, 2005, at 9:30 a.m. Enclosed for your review, is background information to include the Programmatic Agreement between NASA, the NCSHPO and the ACHP, NASA's Procedural Requirements for Identification and Disposition of NASA Artifacts, and photographs, histories, floor plans and maps of the facilities. Also enclosed are the meeting agenda, directions to NASA LaRC, and information on local hotels.

A NASA representative will meet you at the main gate Badge and Pass Office to escort you to the meeting location. We look forward to meeting with you regarding this project. Please feel free to contact me at 757-864-6118, should you have any questions or concerns.

Respectfully,

Rodney T. Harris Center Master Planner Facility Preservation Officer NASA Langley Research Center Integrated Assets Management Services Rodney, T. Harris@Nasa.Gov



January 31, 2005

y to Altin at 300

Virginia Department of Historic Resources Ms. Joanna Wilson Archaeologist 2801 Kensington Avenue Richmond, VA 23221

Dear Ms. Wilson,

Thank you for accepting our invitation to participate in the Proposed Facility Demolition Consultation Meeting at NASA Langley Research Center (LaRC) on February 10, 2005, at 9:30 a.m. Enclosed for your review, is background information to include the Programmatic Agreement between NASA, the NCSHPO and the ACHP, NASA's Procedural Requirements for Identification and Disposition of NASA Artifacts, and photographs, histories, floor plans and maps of the facilities. Also enclosed are the meeting agenda, directions to NASA LaRC, and information on local hotels.

A NASA representative will meet you at the main gate Badge and Pass Office to escort you to the meeting location. We look forward to meeting with you regarding this project. Please feel free to contact me at 757-864-6118, should you have any questions or concerns.

Respectfully,

Rodney T. Harris Center Master Planner Facility Preservation Officer NASA Langley Research Center Integrated Assets Management Services Rodney.T.Harris@Nasa.Gov



January 31, 2005

to Adm lot 300

Dr. Roger D. Launius Chair, Division of Space History National Air and Space Museum Smithsonian Institution P. O. Box 37012 NASM Room 3550, MRC311 Washington, DC 20013-7012

Dear Dr. Launius,

Thank you for accepting our invitation to participate in the Proposed Facility Demolition Consultation Meeting at NASA Langley Research Center (LaRC) on February 10, 2005, at 9:30 a.m. Enclosed for your review, is background information to include the Programmatic Agreement between NASA, the NCSHPO and the ACHP, NASA's Procedural Requirements for Identification and Disposition of NASA Artifacts, and photographs, histories, floor plans and maps of the facilities. Also enclosed are the meeting agenda, directions to NASA LaRC, and information on local hotels.

A NASA representative will meet you at the main gate Badge and Pass Office to escort you to the meeting location. We look forward to meeting with you regarding this project. Please feel free to contact me at 757-864-6118, should you have any questions or concerns.

Respectfully,

Rodney T. Harris Center Master Planner Facility Preservation Officer NASA Langley Research Center Integrated Assets Management Services Rodney.T.Harris@Nasa.Gov



January 31, 2005

> Mr. Ken Kumor Environmental Management Division, Headquarters National Aeronautics and Space Administration Room 6Z70 300 E. St., SW Washington, DC 20546

Dear Mr. Kumor,

Enclosed is the packet of information that was sent to the Agency's attending the meeting here at Langley Research Center (LaRC) on February 10. It includes the Programmatic Agreement, NASA's Procedural Requirements for Identification, and Disposition of NASA Artifacts, and photographs, histories, floor plans and maps of the facilities and a meeting agenda.

We plan to meet at 8:00 a.m., prior to the main meeting. The pre-meeting will be held in the conference room of Building 1183. Please feel free to contact me at 757-864-6856, should you have any questions or concerns.

Respectfully,

Rodney T. Harris Center Master Planner Facility Preservation Officer NASA Langley Research Center Integrated Assets Management Services Rodney.T.Harris@NASA.Gov

AGENDA

NASA Langley Research Center

Proposed Demolition Regulatory Consultation Meeting Reid Conference Center, Hampton Room February 10, 2005 9:30 am

Introductions (9:30-9:45)

Background and Powerpoint Presentation (9:45-10:00)

Discussion (10:00-11:30)

Lunch at the NASA cafeteria (11:45-12:45)

Tour of facilities (1:00-2:45)

Closing meeting/discussion (3:00-4:00)



Proposed Demolition of Various Buildings and Infrastructure NHPA/NEPA Consultation Meeting

Langley Research Center, February 10, 2005

- Mr. William Bolger, Architectural Historian, NPS
- Mr. J. Lawrence Lee, HAER, NPS
- Mr. Thomas McCulloch, Historic Preservation Specialist, ACHP
- Dr. Jeremy R. Kinney, Curator, NASM
- Mr. Christopher Moore, Museum Specialist, NASM
- Dr. Ethel Eaton, Review Compliance Mgr., VDHR
- Ms. Joanna Wilson, Archaeologist/SHPO, VDHR
- Ms. Kristin Hill, Architectural Historian, VDHR
- Mr. Kenneth Kumor, Environmnetal Management Division/FPO, NASA HQ
- Mr. Paul Robert, Environmental Management Division, NASA HQ
- Mr. Mark Batkin, Office of the General Counsel, NASA HQ
- Mr. Ronald DiLustro, Aeronautics Research Mission Directorate, NASA HQ
- Ms. Sherry DiLustro, Facilities Engineering and Real Property Division, NASA HQ
- Mr. Allen Hoilman, Curator, VA Air and Space Center
- Mr. Hugh Cowsert, Base Development Chief, Langley Air Force Base (LAFB)
- Ms. Laura Baie, Community Planner, LAFB
- Ms. Deanna Nix, Real Estate Chief, LAFB
- Mr. Wilson Lundy, Head, Center Operations Directorate (COD), NASA LaRC
- Mr. James Mayhew, COD, NASA LaRC
- Mr. Rodney Harris, LaRC Master Planner/FPO, NASA LaRC
- Mr. Jon Arena, Office of Chief Council, NASA LaRC
- Mr. Jan Benson, Environmental Engineer, NASA LaRC
- Ms. Caroline Diehl, Sr. Environmental Protection Specialist, SAIC, NASA LaRC
- Ms. Kristen Poultney, Project Manager, SAIC, NASA LaRC
- Mr. John Houlahan, Division Manager, SAIC
- Ms. Carol Tyrer, Ops. Manager/Curator, James River Institute for Archaeology
- Ms. Angela Brown, Real Estate Office, NASA LaRC
- Mr. Roger Ferguson, COD, NASA LaRC

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Jan Benson, 01:11 PM 2/17/2005, Fwd: Proposed demolition of Langley Research Center faciliti

X-Sender: j.a.benson@pop.larc.nasa.gov (Unverified) X-Mailer: QUALCOMM Windows Eudora Version 6.1.1.1 Date: Thu, 17 Feb 2005 13:11:45 -0500 To: Caroline Diehl <c.a.diehl@larc.nasa.gov> From: Jan Benson <Jan.A.Benson@nasa.gov> Subject: Fwd: Proposed demolition of Langley Research Center facilities

FYI

X-Sender: kkumor@mail.hg.nasa.gov X-Mailer: QUALCOMM Windows Eudora Version 6.1.1.1 Date: Thu, 17 Feb 2005 12:43:20 -0500 To: Moorec@si.edu, Bill_Bolger@NPS.gov, Ethel.eaton@dhr.virginia.gov, Kinneyj@si.edu, Joanna.Wilson@dhr.virginia.gov, Kristin.hill@dhr.virginia.gov, Larry_Lee@NPS.gov, TMcCulloch@ACHP.gov From: Kenneth Kumor <kkumor@hg.nasa.gov> Subject: Proposed demolition of Langley Research Center facilities Cc: paul.robert-1@nasa.gov, mbatkin@hq.nasa.gov, rdilustr@hq.nasa.gov, Jan.A.Benson@nasa.gov, Rodney.T.Harris@nasa.gov

One and all,

Again, on behalf of NASA, I would like to thank each of you for participating in the daylong meetings and tour on February 10, 2005 concerning the proposed demolition of six structures at Langley Research Center. We are looking forward to your input in 30 days about what factors and ideas you believe the Agency should consider and analyze before making a final decision on the demolition of the facilities in question. Three of the facilities are National Historic Landmarks. The status (i.e., cultural importance) of each of the other three is uncertain, and a study aimed at evaluating potential eligibility for the National Register of Historic Places is in progress. In providing comments to me, please also provide a copy to Rodney Harris, who will be the point-of-contact at Langley Research Center. Mr. Harris's contact information is:

Mr. Rodney T. Harris Facility Preservation Officer Mail Stop 300 Room 155 Building 1238 NASA Langley Research Center 1 East Durand Street Hampton Virginia 23681-2199 electronic mail: Rodney.T.Harris@nasa.gov

Also, Paul Robert of my office who attended the meetings will be working with me on this matter. I would appreciate copying him on any EMails to me. His electronic mail address is: paul.robert-1@nasa.gov .

NASA looks forward to working with you and your organizations on this proposal so that cultural resource concerns are addressed appropriately.

Sincerely,

Kenneth Kumor

Kenneth M. Kumor NASA Federal Preservation Officer Environmental Management Division Mail Suite 6V79 NASA Headquarters 300 E Street, SW Washington, DC 20546

Telephone: 202.358.1112 Facsimile: 202.358.2861 EMail address: Kenneth.M.Kumor@nasa.gov

"The things that will destroy us are: politics without principle; pleasure without conscience; wealth without work; knowledge without character; business without morality; science without humanity; and worship without sacrifice" -- Mahatma Gandhi



COMMONWEALTH of VIRGINIA

W. Tayloe Murphy, Jr. Secretary of Natural Resources

Department of Historic Resources

2801 Kensington Avenue, Richmond, Virginia 23221

March 18, 2005

Kathleen S. Kilpatrick Director

Tel: (804) 367-2323 Fax: (804) 367-2391 TDD: (804) 367-2386 www.dhr.virginia.gov

Mr. Kenneth M. Kumor Environmental Management Division Mail Suite 6V79 NASA Headquarters 300 E Street, SW Washington, DC 20546

Re: Proposed Demolition of Various Buildings and Infrastructure NASA Langley Research Center DHR File # 2002-1560

Dear Mr. Kumor:

We write to you in response to your proposal to demolish five wind tunnel structures, the Gantry crane, and associated buildings. We appreciated the opportunity to visit with you and your staff on site and examine each of the structures in detail. As suggested, this letter is intended to guide you as you begin the Section 106 process giving consideration to all options and alternatives available to you. Three of the structures proposed for demolition have been recognized as National Historic Landmarks and the remaining three are potentially eligible for listing on the National Register of Historic Places. All of these structures are therefore considered "historic properties" according to Section 106 of the National Historic Preservation Act of 1066, as amended, and their demolition will result in an adverse effect. Because three of the structures rise to a higher level of significance as indicated by their recognition as NHLs, their demolition would be a national loss of sobering proportions. Section 106 regulations require the federal agency to consult with both the Advisory Council on Historic Preservation and the Secretary of the Interior as they strive "to the maximum extent possible ... [to] minimize harm to any National Historic Landmark" (36 CFR800.10). As we mentioned during our meeting on February 10, 2005, in order to fulfill its responsibilities under Section 106, NASA must fully investigate and evaluate alternatives to demolition. Although demolition may be one such alternative it cannot be presented as the only solution. We have attached a bulleted list of potential alternatives as well as a brief discussion of other issues we recommend that you consider during your evaluation.

NASA must consult with all interested parties throughout the evaluation process. This requirement is designed both to ensure that the comments and opinions of these parties are considered and to provide you with the opportunity to take advantage of the specialized knowledge that these parties may have. The National Park Service, the Advisory Council on Historic Preservation, and the

Administrative Services 10 Courthouse Avenue Petersburg, VA 23803 Tel: (804) 863-1624 Fax: (804) 862-6196 Capital Region Office 2801 Kensington Ave. Richmond, VA 23221 Tel: (804) 367-2323 Fax: (804) 367-2391 Tidewater Region Office 14415 Old Courthouse Way, 2rd Floor Newport News, VA 23608 Tel: (757) 886-2807 Fax: (757) 886-2808 Roanoke Region Office 1030 Penmar Ave., SE Roanoke, VA 24013 Tel: (540) 857-7585 Fax: (540) 857-7588 Winchester Region Office 107 N. Kent Street, Suite 203 Winchester, VA 22601 Tel: (540) 722-3427 Fax: (540) 722-7535 Mr. Kenneth M. Kumor Proposed Demolitions, NASA/LaRC Facility March 18, 2005 Page 2

Smithsonian Institution have all indicated an interest in this process. You must also provide the public with an opportunity to comment upon any alternatives under consideration. We ask that you provide DHR with copies of correspondence you receive from interested parties. As landowner of record, Langley Air Force Base must be involved in all aspects of this process.

We appreciate your initiating this preliminary meeting to allow the consultative process to begin, and look forward to working with your agency. If you have any questions about the Section 106 review process or our comments, please call me at (804) 367-2323, Ext. 140.

Sincerely,

ane In

Joahna Wilson, Archaeologist Office of Review and Compliance

cc: Mr. Rodney Harris, NASA Langley Research Center

Attachments (2)

Mr. Rodney T. Harris Mail Stop 300 Room 155 Building 1238 NASA Langley Research Center Hampton, VA 23681-2199

1

Attachment 1: Suggested Alternatives for Consideration (Investigation should include, but should not be limited to, the options listed below)

- 1. Continued Use by NASA/Langley
- 2. Third Party Use either as originally intended or through adaptive reuse
- 3. Historic Site/Heritage Tourism Destination under NASA/Langley control
- 4. Historic Site/Heritage Tourism Destination operated by third party
- 5. Repair/Maintenance
- Mothballing (to National Park Service standards see Preservation Brief No. 31: "Mothballing Historic Buildings").
- 7. No Action

40

8. Demolition

For each option we recommend that you consider the following issues: accessibility, feasibility, cost/benefit, security. Please be prepared to present a thorough discussion of each alternative, to include identification of a preferred alternative or alternatives and justification for this decision.

Attachment 2: Other Items for Consideration

- Langley Air Force Base must become an active partner in this discussion as soon as possible. It is important to determine whether or not the existing land transfer agreement with Langley expressly prohibits preservation of the structures in question. Consideration must be given to the historic nature of these buildings by *all* parties involved in the discussion.
- 2. Three of the properties under consideration are listed as National Historic Landmarks for their contributions to the history of the American space program. NHLs are considered to be the "best of the best" and decisions regarding their preservation must take their uniqueness into account. Planning should involve recognition of the long-term effects of decisions regarding the fate of these structures.
- 3. Each of the properties, and the NHLs in particular, must be evaluated in terms of their individual merit as well as their collective contribution to NASA's legacy. Evaluators must keep this legacy in mind, and consider what impact the removal of these iconic structures may have upon it. Can photographs, documents and artifacts be enough to convey the full story? Will NASA and the American public look back in fifty years and regret the decisions made now? Keep in mind that, by your own admission, "There is nothing like being there" when it comes to the NASA experience. The power of place is important.
- 4. The National Park Service and the Advisory Council are both strongly opposed to demolition, and consider it to be the option of last resort. Historic American Engineering Records on the NHL properties are minimal. The NPS has, as well, presented the opinion that, at minimum, the 8 foot and full scale tunnels should be preserved as each structure in and of itself is an artifact.
- 5. A comment was made during our meeting that NASA should refrain from making security decisions based upon current security concerns and national "threat levels", as these situations can change at any time. Again, all options should remain on the table and plans should be made with both current and future needs in mind.
- Known archaeological sites exist adjacent to the Gantry crane, and others may exist adjacent to the remaining structures as well. Please keep this in mind during consideration of alternatives.
- 7. When considering alternatives, keep in mind that demolition will require extensive documentation and research. If demolition is determined to be the preferred alternative, and if this decision can be justified to the satisfaction of the consulting parties, we suggest that NASA provide several options for documentation. (For example, a suggestion was made during the meeting to record oral histories from employees who built and worked within the wind tunnels and with the Gantry.)

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TRIP REPORT – February 10, 2005, meeting at NASA Langley Research Center, Hampton, VA, in regard to the possible demolition of six facilities.

J. Lawrence Lee

INTRODUCTION

For various budgetary and work load reasons, NASA's Langley Research Center in Hampton, VA, has closed several of its facilities that have little or no likelihood of being needed to perform future research work in support of NASA's mission. Seeing no current or future need for these facilities, NASA has embarked on the procedure to dispose of these assets in accordance with NPR 4310.1, "Identification and Disposition of NASA Artifacts (Revalidated 12/8/04)." The February 10 meeting was one of a series to investigate disposition options for six closed facilities. These six facilities ("buildings" in NASA parlance) are:

- Building 640, 8-Foot Transonic Pressure Tunnel
- Building 641, 8-Foot High-Speed/Transonic Tunnel
- Building 643, 30 x 60-Foot Full-Scale Tunnel
- Building 1146, 16-Foot High-Speed/Transonic Tunnel
- Building 1212B, 7 x 10-Foot Subsonic Tunnel
- Building 1297, Lunar Landing Research Facility/Impact Dynamics Research Facility

NASA has determined that it foresees no future use for these buildings as research facilities, either by itself or by any other party. The only exception to this is Building 643, which is used intermittently by Old Dominion University for automotive drag testing. The NASA-ODU agreement for this use runs through 2007, but future operation by ODU is uncertain.

Three of these buildings, 640, 641, and 643, are on Langley's East Side, on property that is part of the U.S. Air Force's Langley AFB. The original agreement between predecessor organizations National Advisory Committee for Aeronautics and the U.S. Army Air Corps calls for NACA to return any of this property to the USAAC in its original condition if NACA no longer has use of the facility on it. NASA believes that this means it must demolish any such building and return bare land to the USAF.

Two of these East Side buildings, 641 and 643, were designated National Historic Landmarks in 1985. These two wind tunnels were unique in their impacts upon aeronautical research. In different ways, each one provided the center with significant, unprecedented capabilities that placed the center at the forefront of the world's aeronautical research. Each possesses distinct design characteristics and a research record that make it a major milestone in the development of aeronautical research and,

thus, a historic artifact of the first order involved in one of the foremost technological developments of the twentieth century.

The third East Side building, 640, was utilized extensively in the development of supercritical airfoils, but the tunnel itself is unremarkable.

The remaining three buildings, 1146, 1212B, and 1297, are on LaRC's West Side, and the USAF has no involvement with this property. Building 1146, which opened in its original configuration in 1941, underwent a major modernization rebuild in the 1950s. It is a good, but not unique, example of modern steel-shell tunnel construction. Building 1212B is one of several remaining 7 x 10-foot tunnels. While it represents one of the most common "workhorse" size wind tunnel designs, it possesses no particularly remarkable features.

Building 1297 is also a National Historic Landmark, a status recognizing from its role in training astronauts in lunar-landing techniques. It was later rebuilt for use in research into aircraft-runway impacts. It is a highly specialized structure that is unique in the world.

MEETING SYNOPSIS

Meeting attendees included myself and Bill Bolger from NPS, representatives from the Smithsonian's National Air and Space Museum, the Virginia Department of Historical Resources, ACHP, the Virginia Air and Space Museum, the James River Institute for Archaeology, and the USAF, along with about a dozen NASA LaRC people.

Following introductions and a short slide show outlining the buildings in question, discussion rather quickly became focused on the possible options for preservation of these facilities, or at least the most significant ones—generally taken to mean the three NHL buildings. Possible limitations resulting from the NACA-USAAC land-use agreement were reviewed, along with ideas for preservation ranging from a stand-alone museum and interpretive center to allowing the structures to stand, but without maintenance or access. At such an early stage of the process, these options were all discussed in very general terms, and with no estimates of the costs involved. At this time, however, it is clear that none of the organizations in attendance has the financial resources to undertake any of the proposed options. Although NASA may ultimately have to fund demolition of some, or all, of these buildings, no estimates of those costs were presented. It was noted that all of the East Side buildings would pose special demolition challenges due to their construction (reinforced concrete) or hazardous materials (asbestos cement). Following lunch, the attendees visited all of the threatened facilities.

NASA personnel appeared to be surprised at the interest expressed in preserving these facilities by non-NASA attendees. They indicated they had been similarly surprised at similar interest expressed in a recent public meeting. The NASA people indicated they could entertain options other than demolition, but that their primary interest was in

reducing charges to their budget. Significant NASA financial participation in any preservation effort, which I take to be much, if anything, above the cost of demolition, appears to be unlikely.

PERSONAL COMMENTS AND OBSERVATIONS

The two NHL wind tunnels, 641 and 643, are major historical artifacts that possess unusual, even unique, significance in the development of aeronautics. Regardless of what decisions are made concerning the future of aeronautical research activities at LaRC, these artifacts should be preserved. Since they are immediately adjacent to one another, a single reservation encompassing both could be established. They are within the confines of Langley AFB, but their location on the shore of the Back River makes their isolation from the rest of the base and public access via a Back River ferry practical.

The Full-Scale Tunnel (643), opened in 1931, was the world's first wind tunnel large enough (30 x 60 feet) to test a complete airplane. It was instrumental in the conduct of numerous performance and drag-reduction tests, including tests involving virtually all World War II U.S. fighter planes. Tests performed here also were crucial to the understanding of scale effect, which allowed model test data to be accurately extrapolated to full-size aircraft. Other work done here involved the analysis of slow-speed (take-off and landing) performance of supersonic aircraft and critical tests leading to modern submarine hull designs. The NACA later built a larger, but similar, tunnel at its Ames Laboratory in California, but this tunnel is one of two tunnels—the Variable Density Tunnel, also an NHL, is the other—that established the Langley Laboratory as preeminent in the pre-World War II world of aeronautical research. Currently, no interpretive materials exist at the site.

The 8-Foot High-Speed Tunnel (641), opened in 1936, is similarly significant to post-World War II research. It was the first large wind tunnel designed for transonic speeds, and it originally feature two new components to address the requirements of such high speeds: an igloo-shaped test area to withstand the low pressures generated, and an airexchange tower to mitigate the heat produced. Both were innovations. Built during the Great Depression, its reinforced concrete construction made possible the use of low-cost materials and WPA labor. Early operation of this tunnel revealed the critical problem of "choking" near the speed of sound, where shock waves prevented operation at or above sonic velocity. After World War II, researchers at Langley developed a test section design, first installed in this tunnel, that employed slots in the walls to manage the shock energy and allow operation above sonic velocity, work that earned the group the prestigious Collier Prize. Richard Whitcomb's subsequent work in this tunnel resulted in the area rule that made supersonic aircraft practical and earned another Collier Trophy. Currently, no interpretive materials exist at the site.

The other NHL facility, the Lunar Landing Research Facility/Impact Dynamics research Facility (1297) on the West Side presents only a slightly less-compelling case for preservation. Astronaut Neil Armstrong's response to a question about how it was like to land on the Moon, that it was "just like Langley," is testament to the importance of this facility to the Apollo program. It was unique in the world in its ability to emulate the lunar gravitational environment for full-scale training. It later proved to be adaptable for use in studies involving airplane crashes onto runways, research that led to improved designs in aircraft structures and seats. While massive, unique, and significant for the programs it hosted, this structure is not so much novel in its design as it is novel in its application of known technology to solve unique, new problems. Building 1297 is on the western side of LaRC, and isolation from the center to accommodate public access could be accomplished by fence relocation and a short access road. Some weathered interpretive materials currently exist at the site.

The other three buildings in this group, 640, 1146, and 1212B, have considerably less historical significance than do the three noted above, though 1146 merits more consideration for preservation than either 640 or 1212B. Building 1146 was the first wind tunnel built on the West Side, and it was the last NACA pre-World War II tunnel, first operating on December 5, 1941. At the time, it was, except for having a smaller drive motor, a virtual duplicate of a contemporary tunnel at NACA's Ames Laboratory. This tunnel hosted considerable work in the development of slotted-wall test sections, largely in perfecting the proper shape and size for the slots. It was substantially rebuilt in 1950 to facilitate transonic testing of large models.

A unique opportunity exists to develop a museum, interpretive, and educational center that would be unparalleled. Centered on landmark buildings 641 and 643, such a center would offer scholars and the public an interpreted exploration into the realms of subsonic and supersonic flight and the facilities. It could offer a permanent home and improved accessibility for the LaRC Archives, which are now housed in the Technical Library and available for research only by application and approval. Additionally, this center would be a better location for the Variable Density Tunnel, now on display with very limited accessibility next to Langley's Reid Conference Center on the West Side. In addition to being available for interpretive presentation with the Full-Scale Tunnel and 8-FootHigh-Speed Tunnel, it would be closer to its physical location when in service:

Significant financial resources would have to be secured to make this possible, but the cost of demolition and material disposal for 641 and 643 will be substantial. (To my knowledge, NASA has yet to develop an accurate estimate for the demolition of any of these buildings.) These funds, which would otherwise have to be secured and spent, would form a significant core for development activities.

There are a number of possible options for developing and operating such a center, but some association with the Virginia Air and Space Museum, the National Air and Space Museum and/or the National Park Service could be advantageous to all concerned. Since no similar public facility exists, it presents an opportunity for creative design and marketing, but the concept of expanding the public's accessibility to classic aircraft—and the better aviation museums draw large crowds—to include the ways, means, and machines to develop these airplanes holds considerable promise. To simply enter the huge test section of the FST for the first evokes an awe that must be experienced to understand. That these facilities exist *in situ* at Langley, America's first major aeronautical laboratory, is of no small historical significance, either.

While 641 and 643 form a core of historic facilities at LaRC that should be preserved if at all possible, Building 1297 on the West Side would make a nice adjunct to the core museum/interpretive center if access can be provided as outlined above. It is anticipated that visitors would drive to this location independently of their visit to the East Side center, and visitation would likely be significantly less than to the center. Ongoing maintenance of this exposed steel structure in a relatively corrosive environment could be problematic, and interpretation of both of its historic functions could be challenging as well.

While I would argue that all of LaRC holds historical significance, some facilities are clearly more significant than others. If any of these buildings are to be preserved, it seems likely that those having less significance may have to be sacrificed. In my opinion, the demolition of buildings 640, 1146, 1212B would result in minimal loss of historical knowledge or attraction. Conversely, buildings 641 and 643 are at the very center of aeronautical history in America, and I strongly believe they should be preserved, even if that preservation amounts to nothing more than leaving them in place until a future opportunity for historical exploitation can be developed. If demolished, America will lose irreplaceable pieces of its technological history, along any opportunity for public appreciation of the facilities that played a large role in keeping American aviation foremost in the world for decades. Building 1297 falls somewhere between these two extremes. Its designation as an NHL was and is clearly justified, but I believe it will be appreciated and studied by a limited number of visitors and scholars, far fewer than could be expected to visit a center based on 641 and 643.

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United States Department of the Interior

NATIONAL PARK SERVICE Northeast Region United States Custom House 200 Chestnut Street Philadelphia, PA 19106

June 23, 2005

Mr. Rodney T. Harris Facility Preservation Officer Mail Stop 300 Room 155 Building 1238 NASA Langley Research Center 1 East Durand Street Hampton, VA 23681-2199

Re: Proposed Demolition of the Eight-Foot Transonic Tunnel NHL (Bldg 641) The Full-Scale Tunnel NHL (Bldg 643) and the Lunar Landing Research Facility NHL (Bldg 1297) and other Buildings and Infrastructure NASA Langley Research Center, Virginia

Dear Rodney:

Thank you for offering the National Park Service the opportunity to consult with you and your colleagues regarding NASA's plans for the six redundant structures at Langley Research Center. I especially appreciate the fact that the preservation review agencies were consulted in the preliminary phase of the planning process. I am especially pleased that Dr. Lawrence Lee from the NPS Washington, D.C. office is a participant in this review given his particular expertise in field of the history of aviation technology. My office is primarily involved in the review of work to National Historic Landmarks under the provisions of Section 106 of the Historic Preservation Act as amended. While three of the structures are not NHLs we recognize that they are all very significant parts of the overall importance of Langley's impressive history of research and development in the fields of air and space technology.

We have received the comments of the Virginia Department of Historic Resources and the Advisory Council on Historic Preservation. We concur with their guidance and encourage NASA to explore a range of treatment options for the six facilities. As we discussed at the February meeting, the importance of these resources recommends them for preservation. While an immediate reuse of the facilities may not be available, the responsible retention of these facilities could be achieved by implementing stabilization and protection measures while a long range program is explored.

We understand that NASA's mission is not to maintain historic resources. However, it is clear that the astounding legacy of NASA and its predecessor, the NACA, in pioneering transonic and deep space travel is one of the greatest achievements of our nation. We urge you to work with all concerned parties to explore what has yet to emerge as the best alternative for these facilities. The solution will require a collaboration of interested parties that does not currently exist. NASA has an opportunity to transcend the normal historic resource mitigation process and seek a vision and strategy for the facilities that will best serve both NASA and the nation. You are especially fortunate in having a situation in which there is no pressing demand on the space. It appears that stabilization and moth-balling of the facilities coupled with a planning process can satisfy the shortterm objective of responsible property management as well as the long term interests of our nation. The appreciation of the importance of these remarkable historic resources has yet to develop but we want to urge you and everyone to imagine the potential that these properties have both for education and tourism. NASA's historic resources are not only of international significance they have the rare power to inspire. We urge you to take the necessary time and to explore every conceivable path in order to allow future generations to be inspired directly and memorably by these works.

The National Park Service will be glad to participate in developing a planning strategy for Langley. While the ultimate solution for the resources is not at hand there are ways that we can help to build awareness and interest. We look forward to working with you. And thank you again for one of the most remarkable site visits I have had the pleasure to attend.

Sincerely,

Bill Balys

William C. Bolger/ National Historic Landmarks Program Manager

Cc: Joanna Wilson, VA Dept of Historic Resources Tom McCulloch, ACHP Caroline Hall, NPS WASO Lawrence Lee, NPS WASO



Reply to Attn of: 300

January 14, 2005

Robert Lindberg President National Institute of Aerospace 144 Research Drive Hampton, VA 23666 Phone: 757-766-1397

Subject: Proposed Demolition of Various Buildings and Infrastructure at NASA Langley Research Center

Dear Mr. Lindberg,

NASA – Langley Research Center is considering the demolition of the following buildings:

- 1. Building 640 (the 8-Foot Transonic Tunnel),
- 2. Building 641 (the 8-Foot High Speed Tunnel only), VDHR# 114-0139
- 3. Building 1146 (the 16-Foot Transonic Tunnel only) and associated Buildings 1146A-C and 1146G-M,
- 4. Building 1212B (the 7 X 10-Foot Subsonic Tunnel Circuit only),
- 5. Building 1297 (the Gantry), VDHR# 114-0140 and associated Buildings 1297A-G,
- 6. Building 643 (the 30 X 60 Foot Full Scale Tunnel), VDHR# 114-0142.

The National Park Service has classified three of the buildings (641, 643, and 1297) as National Historic Landmarks. In addition, three buildings (640, 641, and 643) are located within the Langley Field Historic District. Finally, two buildings (1146 and 1212B) are likely candidates for National Register of Historic Places eligibility.

Both the National Historic Preservation Act and the Programmatic Agreement among NASA, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers require the investigation of alternatives to this proposed action. Such alternatives include the possible transfer of some or all of these facilities to a third party (such as a university or a research institute) for their use.

Mr. Lindberg, I am requesting that the NIA consider these facilities for any possible research potential, and respond (in writing) to this inquiry.

As I mentioned to you during our telephone conversation today, Langley Air Force Base has not indicated any interest in using any of these facilities thus far, however NASA has scheduled a meeting with LAFB next week to confirm this.

Please contact me with any questions and or comments.

~ original signed by~

Rodney T. Harris Master Planner Facility Preservation Officer Integrated Assets Management Team Phone: 757-864-6118 Fax: 757-864-8096 E-mail: rodney.t.harris@larc.nasa.gov





Reply to Attn of 300

March 14, 2005

Robert Lindberg President National Institute of Aerospace 144 Research Drive Hampton, VA 23666 Phone: 757-766-1397

Subject: Proposed Demolition of Various Buildings and Infrastructure at NASA Langley Research Center

Dear Mr. Lindberg,

Back on January 14 of this year I sent you a letter informing you that NASA – Langley Research Center is considering the demolition of the following buildings:

- 1. Building 640 (the 8-Foot Transonic Tunnel),
- 2. Building 641 (the 8-Foot High Speed Tunnel only), VDHR# 114-0139
- Building 1146 (the 16-Foot Transonic Tunnel only) and associated Buildings 1146A-C and 1146G-M,
- 4. Building 1212B (the 7 X 10-Foot Subsonic Tunnel Circuit only),
- 5. Building 1297 (the Gantry), VDHR# 114-0140 and associated Buildings 1297A-G,
- 6. Building 643 (the 30 X 60 Foot Full Scale Tunnel), VDHR# 114-0142.

You may recall that the National Park Service has classified three of the buildings (641, 643, and 1297) as National Historic Landmarks. In addition, three buildings (640, 641, and 643) are located within the Langley Field Historic District. Finally, two buildings (1146 and 1212B) are likely candidates for National Register of Historic Places eligibility.

Both the National Historic Preservation Act and the Programmatic Agreement among NASA, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers require the investigation of alternatives to this proposed action. Such alternatives include the possible transfer of some or all of these facilities to a third party (such as a university or a research institute) for their use.

My January 14 letter requested that you and the NIA consider these facilities for any possible research potential, and respond (in writing) to that inquiry.

My management requires a written response within 30 days of this letter's date from the NIA on this subject, so that they may proceed with planning the appropriate actions required by various regulatory agencies.

Please contact me with any questions and or comments.

~ original signed by~

Rodney T. Harris Master Planner Facility Preservation Officer Property Management Services Phone: 757-864-6118 Fax: 757-864-8096 E-mail: rodney.t.harris@larc.nasa.gov

NATIONAL INSTITUTE OF AEROSPACE



Robert E. Lindberg, Eng.Sc.D. President & Executive Director

March 18, 2005

Mr. Rodney T. Harris Center Master Planner Facility Preservation Officer National Aeronautics and Space Administration Langley Research Center Center Operations Directorate (COD) Hampton Virginia 23681-2199

Subject: Proposed Demolition of Various Buildings and Infrastructure at NASA Langley Research Center

Dear Mr. Harris:

With regard to the facilities being considered for demolition at NASA Langley; NIA certainly recognizes the historical significance and the vast contributions these facilities have made to the aerospace community throughout their lifetime. We are also pleased that you would consider offering NIA the opportunity to investigate the research potential in each facility. However, taking into account the fact that NIA is still young and growing, we are not prepared at this time to take possession of any or all of these facilities. The capital required to staff and maintain these large facilities is prohibitive at this time. NIA and its member universities will continue to support Langley in any way it can as other new creative alternatives for facility ownership are evaluated.

Sincerely,

Robert E. Lindberg, Eng. Sc.D.

www.nianet.org

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March 18, 2005

Reply to Attn of: 300

James Cross, Program Chair Department of Aerospace Engineering College of Engineering and Technology Old Dominion University 241 Kaufman Hall Norfolk, VA 23529-0247

Subject: Proposed Demolition of Various Buildings and Infrastructure at NASA Langley Research Center

Dear Mr. Cross,

NASA - Langley Research Center is considering the demolition of the following buildings:

- Building 640 (the 8-Foot Transonic Tunnel),
- 2. Building 641 (the 8-Foot High Speed Tunnel only), VDHR# 114-0139
- Building 1146 (the 16-Foot Transonic Tunnel only) and associated Buildings 1146A- C and 1146G-M,
- 4. Building 1212B (the 7 X 10-Foot Subsonic Tunnel Circuit only),
- 5. Building 1297 (the Gantry), VDHR# 114-0140 and associated Buildings 1297A-G,
- Building 643 (the 30 X 60 Foot Full Scale Tunnel), VDHR# 114-0142.

The National Park Service has classified three of the buildings (641, 643, and 1297) as National Historic Landmarks. In addition, three buildings (640, 641, and 643) are located within the Langley Field Historic District. Finally, two buildings (1146 and 1212B) are likely candidates for National Register of Historic Places eligibility.

Both the National Historic Preservation Act and the Programmatic Agreement among NASA, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers require the investigation of alternatives to this proposed action. Such alternatives include the possible transfer of some or all of these facilities to a third party (such as a university or a research institute) for their use.

Mr. Cross, I am requesting that ODU's Department of Aerospace Engineering consider these facilities for any possible research potential, and respond (in writing) to this inquiry within 30 calendar days. Neither Langley Air Force Base nor the National Institute of Aerospace has any interest in using any of these facilities.

Please contact me with any questions and or comments.

ATC

Rodney T. Harris Master Planner Facility Preservation Officer Property Management Team Phone: 757-864-6118 Fax: 757-864-8096 E-mail: rodney.t.harris@larc.nasa.gov


OLD DOMINION UNIVERSITY

Office of the President

Koch Hall Norfolk, Virginia 23529 Telephone: (757) 683-3159 FAX: (757) 683-5679

April 18, 2005

Mr. Rodney T. Harris Master Planner Facility Preservation Officer Property Management Team ATTN: 300 fax: 757-864-8096

Re: Proposed Demolition of Various Buildings and Infrastructure at NASA Langley Research Center

Dear Mr. Harris,

As you know, we have successfully operated the 30 x 60 Foot Full Scale Tunnel (building 643) as a commercial, not-for-profit, enterprise center since August 1997. We have developed the facility for aerodynamic test and development of race cars, and heavy tractor-trailer rigs, as well as other non-aerospace applications. Further, we have tested a series of military aircraft, including UAV and UCAV configurations. The revenue produced by commercial operations has supported a substantial academic program that includes graduate student stipends and student research. The tunnel is, also, the facility base for the LaRC-funded graduate degree program in experimental aeronautics. In short, the 30 x 60 is quite useful for traditional aerodynamic tests of very large-scale models of aerospace vehicles as well as a broad range of ground vehicles at low speeds.

We would be more than willing to accept transfer of ownership and make this operation a success both in terms of research and financially if NASA could assume responsibility for painting and repair.

We believe, as well, that the 16-foot transonic tunnel and the gantry are commercially viable and serve unique and valuable niche purposes provided suitable repairs could be made. Buildings 640, 641, and 1212B have essentially been stripped of critical equipment and start up equipment. We must, however, keep in mind that the capabilities of those facilities have been superceded or duplicated by more recent and capable facilities. I would not, therefore, encourage the restart of these buildings (640, 641, and 1212B).

Old Dominion University is an equal opportunity, affirmative action institution.

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I hope these opinions will be of use, and I would be pleased to discuss them further if desired. I would also be pleased to hear and discuss your views and any possible arrangements you might imagine. It would be an honor to serve our country in this fashion.

Sincerely yours,

Roseann Lunte

Roseann Runte President

RR/cdd

National Aeronautics and Space Administration Langley Research Center Hampton, VA 23681-2199



May 6, 2005

Repty to Atta at:

300

Roseann Runte, President Old Dominion University Koch Hall Norfolk, VA 23529

Subject: Proposed Demolition of Various Buildings and Infrastructure at NASA Langley Research Center

Dear President Runte,

Thank you for your timely response to our recent inquiry.

In your letter dated April 18, 2005, you stated that ODU would be willing to accept the transfer of ownership of three of the six buildings in question: The 30 x 60 Foot Full Scale Tunnel (Building 643), The 16 – Foot Transonic Tunnel (Building 1146), and the Impact Dynamics Research Facility (Gantry - Building 1297). Your letter further stated that this transfer would be made under the condition that NASA assume responsibility for the painting and repair of these facilities.

My senior management has requested that I obtain some clarification of the scope and extent of this repair that ODU envisions NASA undertaking. Please keep in mind that the cost of maintenance is one of the important factors in NASA's decision to consider these facilities for demolition. It is also important to realize that NASA will not renew the MOA with ODU governing the operation of Building 643, as Langley Air Force Base wishes to acquire the land occupied by the three East Area buildings (640, 641, and 643) so that they may develop their property for their use.

In addition, it now appears that NASA may re-activate the Gantry for an undetermined duration of program use. Thus, the only real prospect for any transfer to ODU is currently the 16 – Foot Transonic Tunnel (Building 1146).

Please contact me at 757-864-6118 with any questions and or comments.

Cordially,

By Th

Rodney T. Harris Master Planner Facility Preservation Officer Property Management Services LaRC letter, to Runte; RTHarris, dated 5/6/05

cc: 101/CRM 223/COD 300/PM Svs

300/R.T.Harris

300/RTHarris: rth 5/6/05 (46118)

300/JWM JWM 5/6/05 223/WTL WTL



OLD DOMINION UNIVERSITY

Office of the President

Koch Hall Norfolk, Virginia 23529 Telephone: (757) 683-3159 FAX: (757) 683-5679

July 18, 2005

Mr. Rodney T. Harris Master Planner Facility Preservation Officer Property Management Services National Aeronautics and Space Administration Langley Research Center Hampton, VA 23681-2199

Dear Mr. Harris,

Thank you very much for your letter of May 6. I would be very pleased to pursue the wind-tunnel discussion and explore every possibility which might be available to us.

I am sure that the combined strength and experience we possess together (NASA and ODU) will enable us to serve once more our country effectively and efficiently. These are valuable facilities which we have demonstrated the ability to manage effective and successfully.

I look forward to hearing from you.

Sincerely yours,

searn Runte

Roseann Runte President

RR/th

cc: Dr. Mohammad Karim Dr. Oktay Baysal Dr. Jim J. Cross, Jr.

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National Aeronautics and Space Administration Langley Research Center Hampton, VA 23681-2199



March 18, 2005

Hepty to Attn ot. 300

Roy V. Harris, Jr. Chief Technical Advisor NASA Aeronautics Support Team 140 Wareham's Point Williamsburg, VA 23185

Subject: Proposed Demolition of Various Buildings and Infrastructure at NASA Langley Research Center

Dear Mr. Harris,

NASA - Langley Research Center is considering the demolition of the following buildings:

- Building 640 (the 8-Foot Transonic Tunnel),
- 2. Building 641 (the 8-Foot High Speed Tunnel only), VDHR# 114-0139
- Building 1146 (the 16-Foot Transonic Tunnel only) and associated Buildings 1146A-C and 1146G-M,
- 4. Building 1212B (the 7 X 10-Foot Subsonic Tunnel Circuit only),
- 5. Building 1297 (the Gantry), VDHR# 114-0140 and associated Buildings 1297A-G,
- 6. Building 643 (the 30 X 60 Foot Full Scale Tunnel), VDHR# 114-0142.

The National Park Service has classified three of the buildings (641, 643, and 1297) as National Historic Landmarks. In addition, three buildings (640, 641, and 643) are located within the Langley Field Historic District. Finally, two buildings (1146 and 1212B) are likely candidates for National Register of Historic Places eligibility.

Both the National Historic Preservation Act and the Programmatic Agreement among NASA, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers require the investigation of alternatives to this proposed action. Such alternatives include the possible transfer of some or all of these facilities to a third party (such as a university or a research institute) for their use.

Mr. Harris, I am requesting NAST assistance in identifying entities that may be interested in taking over the operation of one or more of these facilities. We are in the process of contacting Old Dominion University's Department of Aerospace Engineering to see if they are interested in any of the facilities.

Neither Langley Air Force Base nor the National Institute of Aerospace has any interest in using any of these facilities.

Any assistance NAST can offer will be appreciated. We are requesting a response, in writing, within 30 calendar days.

Please contact me with any questions and or comments.

Rodney T. Harris Master Planner Facility Preservation Officer Property Management Team Phone: 757-864-6118 Fax: 757-864-8096 E-mail: rodney.t.harris@larc.nasa.gov

National Aeronautics and Space Administration

Langley Research Center 100 NASA Road Hampton, VA 23681-2199



May 3, 2006

Reply to Attn. of: 106

Brigadier General Burton M. Field Commander, First Fighter Wing 159 Sweeney Blvd, Suite 200 Langley AFB, VA 23665-2291

Dear General Field:

NASA Langley Research Center (LaRC) has identified three of its wind tunnel facilities located on Langley Air Force Base (LAFB) property as potential demolition candidates. The facilities are Building 640 (the 8-Foot Transonic Pressure Tunnel), Building 641 (the 8-Foot High Speed Tunnel), and Building 643 (The 30 x 60-Foot Full Scale Tunnel). The facilities occupy approximately 3.23 acres of land that is part of a 1939 land use agreement between LAFB and NASA. The agreement stipulates that NASA return the property to LAFB in a condition satisfactory to you, should NASA no longer have a need to use, operate or maintain the facilities. NASA intends to comply with this requirement by demolishing these facilities and relinquishing to you the land these facilities currently occupy.

The 8-Foot Transonic Pressure Tunnel and the 8-Foot High Speed Tunnel were abandoned by NASA in 1996 and 1961, respectively. The office wing that is attached to the 8-Foot High Speed Tunnel has been occupied by Air Force organizations since 1997 and is not included in any of NASA's demolition plans. Under a MOA with NASA, Old Dominion University has been operating the 30 x 60 Full Scale Tunnel since 1997. The agreement expires in August 2007 and will not be renewed.

All of these buildings have been or are being taken offline because their contribution to NASA no longer justifies their expense. This action is particularly significant now, as NASA undergoes fundamental transformation in both business practices and mission.

The 8-Foot High Speed Tunnel and the 30 x 60-Foot Full Scale Tunnel were designated National Historic Landmarks in 1985. The 8-Foot Transonic Pressure Tunnel is included in an ongoing historic building survey, which will confirm its potential eligibility for listing on the National Register of Historic Places. In addition, all three facilities are located within the proposed Langley Field Historic District. In order to comply with the Section 106 requirements of the National Historic Preservation Act, NASA LaRC has been in consultation with the Virginia Department of Historic Resources (VDHR) and the Advisory Council on Historic Preservation (ACHP) regarding the proposed demolition of these facilities.

Both VDHR and the ACHP have stressed that NASA must explore alternatives to demolition. (See the attached letter from VDHR, dated March 18, 2005, and note item 1 on Attachment 2 of the letter).

In order to address their concerns, NASA LaRC will prepare a formal study of alternatives to demolishing these facilities. This study is to be completed in July 2006. NASA needs your participation and input in order to complete the alternatives analysis. Therefore, we request that you provide your written input and comments concerning the feasibility of mothballing the facilities, turning them into heritage/tourism sites that would be available to the general public, or some other alternative use for the facilities (e.g., as office space). If these alternatives are not compatible with the Air Force's current or foreseeable requirements, please provide us with your comments to assist us in documenting the decision. My point of contact for this matter is Mr. Rodney Harris, who can be reached at 864-6118, Mail Stop 300. Please feel free to have your counterparts contact him if you have questions regarding this matter.

We appreciate your attention and assistance in this matter and look forward to working with you to reach a mutually satisfactory decision.

Sincerely,

Lesa B. Roe

Director

Enclosure



DEPARTMENT OF THE AIR FORCE HEADQUARTERS 1ST FIGHTER WING LANGLEY AIR FORCE BASE VA

OFFICE OF THE COMMANDER 159 SWEENEY BLVD SUITE 200 LANGLEY AFB VA 23665-2291

Ms. Lesa B. Roe Director National Aeronautics and Space Administration Langley Research Center 100 NASA Road Hampton VA 23681-2199

Dear Ms. Roe

We endorse the preservation of historic properties, wherever they contribute to, and are compatible with, accomplishment of our mission. My staff has evaluated various alternatives to the demolition of your three wind tunnel facilities, Buildings 640, 641 and 643, and each is discussed below.

First, regarding the alternative of preserving and "mothballing" the facilities, Langley AFB acceptance of these properties would require funding for their maintenance. Funding for maintenance type activities is currently very scarce, and the Air Force has no desire to acquire facilities which must then be mothballed.

Second, regarding use of the facilities as a museum, this action requires approval by the Secretary of the Air Force. We have discussed this alternative with Air Force History and Museum Program representatives, and they are not in favor of this proposal. Since these three properties are representative of NASA heritage, and not the Air Force's, they are considered to be outside the mission of the Air Force museum program. Additionally, should NASA or some other source provide the funding for a museum project, obtaining funding for operation of the buildings as a museum would be a challenge, and allowing the public access to the properties on Langley AFB, in the post 9/11 environment, is an unacceptable scenario.

Lastly, wind tunnels are very specialized, high technology properties, making their adaptive reuse for other functions, such as administrative office space, much more difficult. If adaptive reuse success stories involving similar structures are discovered, perhaps those ideas/techniques could be emulated here. If such examples were identified, we would be happy to review them.

Should demolition eventually be determined as the appropriate course of action, a possible mitigative measure could be the removal of parts of the wind tunnels for display at the Smithsonian or another museum. As mentioned by the Virginia Department of Historic Resources, oral histories of the properties are also an option. A video telling the story of the wind tunnels could also be considered.

On another note, the Air Force *has* expressed an interest in obtaining other, potentially excess, NASA facilities, numbers 580, 582, 583, 584, 647 and 720. We believe it is feasible to adapt these buildings to help meet our administrative space requirements.

We hope these ideas are helpful to you. Thank you very much for allowing us to offer our comments as a part of your alternatives analysis. We look forward to seeing the completed alternatives analysis study later this summer.

Sincerely

BURTON M. FIELD Brigadier General, USAF Commander

National Aeronautics and Space Administration

Langley Research Center 100 NASA Road Hampton, VA 23681-2199



June 22, 2006

Reply to Attn. of: 300

Jesse T. Wallace, Jr. Hampton City Manager 22 Lincoln Street 8th Floor City Hall Hampton, VA 23669

Dear Mr. Wallace:

NASA Langley Research Center (LaRC) has several of its wind tunnel facilities proposed for demolition. Among those facilities being considered are the 16-Foot Transonic Tunnel (16 – Foot TT) and the 7 X 10-Foot High Speed Tunnel (HST). Both facilities were closed (in 2004 and 1994, respectively) by LaRC as they were no longer needed to support NASA's mission and duplicate capabilities existed elsewhere within the Agency. As NASA undergoes fundamental transformation in both business practices and mission, we do not have the resources to continue to maintain these wind tunnels.

Due to the potentially historic nature of both facilities, NASA LaRC has been in consultation with the Virginia Department of Historic Resources (VDHR) and the Advisory Council on Historic Preservation (ACHP) regarding the proposed demolitions. Both VDHR and the ACHP have stressed that NASA must explore alternatives to demolition, such as adaptive reuse of the facility or turning them into heritage tourism sites, operated by a third party.

In order to address their concerns, NASA requests your assistance in exploring alternatives to demolition for both wind tunnels. We would like to know if the City of Hampton would consider operating and maintaining the wind tunnels as heritage/tourism sites, or finding some other alternative use for the facilities (e.g., adaptive reuse). Enclosed are the location map and photographs of the facilities for your review. We appreciate your feedback and any other ideas you may have regarding alternatives.

NASA plans to include your feedback in an Alternatives Study which is planned for completion in August 2006. As such, we request your response by July 20, 2006.

I have included a photograph and a map of each facility for your use.

Please feel free to contact me at 757-864-6118 if you have questions regarding this request.

Cordially,

A/

Rodney T. Harris Master Planner Historic Preservation Officer

Enclosures

AUG - 2 PM 12: 25



F.1010

City Manager

July 24, 2006

Harris

Mr. Rodney T. Harris Master Planner, Historic Preservation Office NASA/Langley Research Center 100 NASA Road Hampton, VA 23681-2199

Dear Mr. Harris:

Thank you for the opportunity to consider integrating the wind tunnel facilities at NASA/ Langley Research Center for use with Hampton programs. I reviewed this possibility with staff and also discussed with the Executive Director of the Virginia Air and Space Center for consideration. Based on our review, we have concluded that the City of Hampton does not have a use for the facilities in our programs. We do appreciate the opportunity, however, to review our options before the demolition process gets underway.

Sincerely,

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Jesse T. Wallace, Jr. City Manager

/dh

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CITY OF HAMPTON (757) 727-6392 FAX (757) 728-3037 22 LINCOLN STREET, HAMPTON, VIRGINIA 23669

"Oldest Continuous English-Speaking Settlement in America - 1610"

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National Aeronautics and Space Administration Langley Research Center Hampton, VA 23681-2199



August 24, 2006

Reply to Attn of 300

Department of Historic Resources Office of Review and Compliance ATTN: Joanna Wilson and Kristin Hill 2801 Kensington Avenue Richmond, Virginia 23221

SUBJECT: Demolition Project Status Report, NASA Langley Research Center, DHR File No. 2002-1560

Dear Ms. Wilson and Ms. Hill:

The purpose of this letter is to provide you with a status report on NASA's proposed demolition of various buildings and infrastructure at Langley Research Center (LaRC) in Hampton, Virginia. In addition to the current status of the project, we are providing you with background information on the actions NASA LaRC has taken and the activities that have occurred from the beginning of the project to the present. We are also including NASA's planned future actions and a schedule. This letter, with attachments, continues NASA LaRC's Section 106 consultation with your office, the Advisory Council on Historic Preservation (ACHP) and the National Park Service (NPS) regarding the proposed undertaking.

Background

July 2004 – NASA LaRC's Historic Preservation Officer initiated consultation with VDHR regarding the proposed undertaking (see Attachment A, letter dated July 22, 2004 – includes intent to follow the Programmatic Agreement (PA) and project review forms for each of the six buildings. The PA and a copy of the same letter that was sent to the ACHP are also included in Attachment A)

August 2004 - NASA sent a scoping letter to local government and other agencies to solicit comments regarding the proposed demolitions (see Attachment B, letter dated August 6, 2004)

August 2004 - NASA held a meeting on site at LaRC with Virginia Department of Historic Resources (VDHR) staff. Attendees – Rodney Harris, Alan Farrow, Jan Benson, Caroline Diehl, Carol Tyrer, Susan Smead, and Joanna Wilson. The participants discussed the demolition project as well as other initiatives involving cultural resource issues at LaRC. During the meeting, NASA received concurrence from VDHR that all six of the facilities could be managed in accordance with the stipulations of the Programmatic Agreement (PA). (see Attachment C, letter dated October 22, 2004, response letter from Susan Smead that summarizes the meeting)

August 2004 - NASA posted a public notice in the Daily Press regarding the proposed demolitions to allow for public comment. (see Attachment D, Daily Press Public Notice)

January 2005 – NASA held a public meeting regarding the proposed demolitions. Attendees (approximately 54) were given the opportunity to voice their concerns and provide suggestions for alternatives to demolition. (see Attachment E for minutes of the public meeting)

February 2005 – NASA hosted a consultation meeting on site at LaRC. Attendees included staff from VDHR, the ACHP, the NPS, the Smithsonian's National Air and Space Museum (NASM), Langley Air Force Base, and the Virginia Air and Space Center. Participants discussed the proposed undertaking and toured the facilities proposed for demolition. (see Attachment F for letters received from VDHR, the ACHP and the NPS following the meeting)

Spring 2005 to present – NASA continues to send letters to local government and organizations soliciting possible alternatives/reuse of the wind tunnels. NASA has also been proactive in trying to involve Langley Air Force Base since three of the facilities are located on their land. (see Attachment G for solicitation and response letters, and correspondence between NASA and LAFB)

August 2005 – The Gantry (Lunar Lander Facility) was removed from the demolition list and reopened because the facility still offered unique testing capabilities that would support NASA's new vision for space exploration, and it preserved the integrity of the facility as a National Historic Landmark. The Gantry is currently being used for testing of landing systems for the Crew Exploration Vehicle (CEV) in support of the Constellation Program, NASA's proposed successor to the Space Shuttle Program.

October 2005 – NASA met with VDHR staff in Richmond to discuss various cultural resource activities at LaRC. During the meeting, NASA requested concurrence from VDHR to handle the Building 1212B status and demolition separately due to demolition funding issues. (see Attachment H, letter dated November 7, 2005 for meeting summary)

May 2006 – NASA submitted information to VDHR regarding eligibility and proposed mitigation for Building 1212B. VDHR requested an analysis of alternatives to demolition of the facility. (see Attachment I, letters dated May 2, 2006 and June 2, 2006)

Current Status

The following briefly describes the current status of NASA's proposed demolition of various buildings and infrastructure at LaRC:

- The Gantry is no longer on the demolition list NASA has determined that continued use of this facility is most prudent as it avoids any adverse impact to the National Historic Landmark property.
- NASA is managing the proposed demolition of Building 1212B, the 7- by 10-Foot High Speed Tunnel (site 114-5313-0091) separately from the other four facilities. NASA is in the process of preparing an analysis of alternatives for this facility. The analysis will be submitted to VDHR, the ACHP and the NPS for review and comment. NASA plans to submit this information in September 2006.
- NASA plans to proceed with Section 106 consultation with VDHR, the ACHP and the NPS regarding demolition of the following four facilities:
 - Building 640, 8-Foot Transonic Pressure Tunnel
 - Building 641, 8-Foot High Speed Tunnel (tunnel circuit only)
 - · Building 643, 30- by 60-Foot Full Scale Tunnel
 - Building 1146, 16-Foot Transonic Tunnel

The discussion below relates to Buildings 640, 641,643, and 1146.

Future Actions

NASA has determined that demolition of the four wind tunnels constitutes an adverse effect on the historic properties. Consistent with NASA's initial consultation letter to VDHR and the ACHP (included at Attachment A) and subsequent correspondence with VDHR to manage all of the facilities in the same manner, NASA plans to follow the requirements of the PA (included in Attachment A) between NASA, the ACHP, and the National Conference of State Historic Preservation Officers to minimize the adverse impact of demolition. As such, in accordance with Stipulation II.A.1 of the PA, NASA will prepare the following:

- a description of the undertaking, with photos, maps, and drawings;
- a description of the affected Landmarks (or properties)
- a description of the effects of the undertaking on the affected landmarks (or properties);
- a description of the alternatives to the proposed action which were considered and reasons not chosen;
- a description of any mitigation measures proposed;

- a description of NASA's effort, if appropriate, to obtain and consider views of affected interested persons on the proposed undertaking, including a copy of any comments received; and
- the planning and approval schedule for the proposed undertaking.

NASA plans to submit this information to your office, the ACHP and the NPS in October of 2006. In addition, NASA intends to carry out mitigation measures in accordance with Stipulation III of the PA to include recordation of the properties and possible curation of any significant artifacts with the NASM. NASA would carry out the mitigation measures upon completion of the consultation process with your office and other consulting parties.

Copies of this letter, with attachments, are also being provided to the ACHP and the NPS for their review and comment. Please contact me should you have any questions or require additional information.

Respectfully,

Rodney T. Harris Center Master Planner Historic Preservation Officer NASA Langley Research Center Capital Assets Management

Phone: (757)864-6118 Fax: (757)864-8096 E-mail: <u>Rodney.t.harris@nasa.gov</u>

Enclosures

cc: Tom McCulloch, ACHP Bill Bolger, NPS



DEPARTMENT OF THE AIR FORCE HEADQUARTERS 1ST FIGHTER WING LANGLEY AIR FORCE BASE VA

OFFICE OF THE COMMANDER 159 SWEENEY BLVD SUITE 200 LANGLEY AFB VA 23665-2291

1 0 JUL 2007

Ms. Lesa B. Roe Director, National Aeronautics and Space Administration Langley Research Center 100 NASA Road Hampton, VA 23681-2199

Dear Ms. Roe

This letter is in response to your 16 May 07 correspondence regarding Facility 643, a NASA-Langley Research Center (NASA-LaRC) owned facility located at Langley Air Force Base (LAFB).

Should NASA decide to discontinue the agreement with Old Dominion University and not to enter an agreement with any other such entity, LAFB would have no desire to acquire the facility and would request that the land be returned to the AF in accordance with the 1939 land use agreement. The tenuous funding environment within the Department of Defense today makes funding everyday requirements for our Airmen a challenge and the acquisition of such a highly specialized wind tunnel facility an ill-advised option for the AF.

Should demolition eventually be determined as the appropriate course of action, the intent of LAFB would be to redevelop the property for administrative facilities to support the mission of Air Combat Command. Of course, the current funding environment makes construction of new administrative facilities unlikely in the immediate future. Our previous correspondence with you regarding the acquisition or lease of space in other NASA-LaRC facilities (580, 582, 583, 584, 647, 720) is evidence of our need for administrative space, as well as our commitment to adaptively reuse historic properties to meet modern requirements when it is feasible to do so. LAFB has evaluated F. 643 and we do not believe it could be adaptively reused for administrative space, including costs for environmental remediation.

In our previous correspondence, dated 9 Aug 06, we commented on your alternatives to demolition. In particular, we expressed concerns about a proposal to utilize F. 643 as a museum. The post 9/11 environment makes a commitment to open LAFB to the public infeasible; the recent discovery of the New Jersey Jihad plot makes the risks to military installations today even more evident. In addition, development of a museum would carry with it substantial costs, such as those required to improve parking or provide shuttle access, costs that the AF cannot currently fund. Finally, use of facilities on military installations as museums requires approval by the Secretary of the Air Force; such museums must be consistent with the mission of the Air Force Museum Program, and because this museum would discuss NASA history, it is outside the realm

Global Power For America

of what is authorized by the Air Force History and Museum Program. Overall, the functions that could be appropriately housed in this facility would be severely limited by cost considerations and, most importantly, security concerns. LAFB would need to closely review any agreements made between NASA and non-Federal agencies for continued usage of the facility.

We hope that this response provides adequate information for environmental compliance purposes. Should you have any comments about the response, please feel free to contact my representative within the 1st Civil Engineer Squadron. The Deputy Base Civil Engineer, Ms. Brenda Cook, can be reached at 757-764-2025 or brenda.cook@langley.af.mil.

Sincerely

MARK A. BARRETT, Colonel, USAF Commander

May 16, 2007

106

K4800

Colonel Mark A. Barrett Commander Attn: 1 FW/CC 159 Sweeney Blvd, Suite 200, Building 764 Langley Air Force Base, VA 23665-2213

Dear Colonel Barrett:

The purpose of this letter is to ascertain Langley Air Force Base's need for the land that NASA's 30 X 60 Foot Full Scale Wind Tunnel (Building 643) currently occupies.

NASA no longer uses the Full Scale Tunnel for aeronautics research, but it is used by Old Dominion University (ODU) for a combination of aeronautics and other research. The agreement between NASA and ODU expires in August 2009, at which time NASA's need for the land occupied by the Full Scale Wind Tunnel will end. In accordance with our Land Use Permit with Langley Air Force Base dated March 2, 1939, we are obligated to return the land to the Air Force in a satisfactory condition when our need for the land has ended.

The Full Scale Tunnel is a National Historic Landmark. NASA is in the midst of performing actions to comply with the National Historic Preservation Act and the National Environmental Policy Act. These steps may lead to environmental mitigation procedures to permit the demolition of the tunnel; however, the State Historic Preservation Officer (SHPO) feels it is a resource that should be preserved for its historic and educational values. The SHPO has stated that the three parties (Air Force, NASA, and ODU) need to work together to devise a plan that will keep the facility open, useable, and as an educational resource for the public.

In order to support our environmental compliance activities, NASA needs to know whether the Air Force believes that maintaining the current structure on LAFB property is feasible and compatible with your long-term plans for using this land. Accordingly, we would appreciate your comments regarding whether preserving the Full Scale Wind Tunnel is feasible and consistent with your land use plan for that site.

MAY 1.0 PH 3:50

The NASA Langley Research Center point of contact for this matter is Mr. James Mayhew. Should you have questions regarding this matter, please feel free to contact him at 864-6923. In order to document the environmental regard regarding this project, we would appreciate a written response. Thank you for your consideration of this matter of mutual interest.

ORIGINAL SICILED BY USA

Lesa B. Roe Director

cc: Brenda Cook Deputy Civil Engineer 1st Civil Engineering Squadron Attn: 1CES-CEV 37 Sweeney Blvd. Langley Air Force Base, VA 23655

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National Aeronautics and Space Administration Langley Research Center Hampton, VA 23681-2199



March 12, 2008

Reply to Attn of: 300

Virginia Department of Historic Resources Ms. Joanna Wilson Archaeologist, Office of Review and Compliance 2801 Kensington Avenue Richmond, VA 23221

Subject: Demolition of Buildings 640, 641, 643, and 1146 at NASA Langley Research Center, Hampton, Virginia, DHR No. 2002-1560

Dear Ms. Wilson,

The purpose of this letter is to inform you that the National Aeronautics and Space Administration's Langley Research Center (NASA LaRC) has fulfilled the requirements of the Programmatic Agreement (PA) among the National Aeronautics and Space Administration, the National Conference of State Historic Preservation Officers, and the Advisory Council on Historic Preservation (ACHP), and is proceeding with demolition of the following four facilities at NASA LaRC located in Hampton, Virginia:

- Building 640 [the 8-Foot Transonic Pressure Tunnel (TPT)],
- Building 641 [the 8-Foot High Speed Tunnel (HST) tunnel circuit only],
- Building 643 [the Full Scale Tunnel],
- Building 1146 [the 16-Foot Transonic Tunnel (TT) tunnel circuit and ten small support facilities]

Buildings 641 and 643 are listed National Historic Landmarks. NASA LaRC, in consultation with the Virginia Department of Historic Resources (VASHPO), has determined that Buildings 640 and 1146 are potentially eligible for listing in the National Register of Historic Places (NRHP) both individually, and as contributing resources to a proposed NASA LaRC Historic District.

Pursuant to the PA, NASA LaRC has consulted with the VASHPO and the ACHP in order to take into account the effect of the undertaking on historic properties. NASA LaRC has consulted in accordance with stipulation II and completed proposed mitigation measures in accordance with stipulation III of the PA. A summary of NASA LaRC's fulfillment of the stipulations of the PA follows:

Consultation Process (Stipulation II)

In July 2004, NASA LaRC initiated consultation with the ACHP and the VASHPO regarding NASA's proposal to demolish Buildings 640, 641, 643, and 1146. The consultation package included a letter describing the proposed demolition project, VASHPO project review forms, a map and photographs of the facilities, and a copy of the PA.

In addition to the consultation package described above, in August 2004, NASA LaRC sent scoping letters to fifteen local, state and federal agencies to elicit comments on the potential environmental and cultural resource impacts regarding the proposed demolitions. No negative comments were received.

In February 2005, NASA LaRC held a public meeting to provide a forum for the community to comment on the proposed demolitions. The meeting was publicized in the *Daily Press*, a local newspaper with regional circulation. Approximately 70 people, namely local residents and current and retired NASA LaRC employees attended the meeting. In addition to answering questions regarding the demolitions, NASA recorded comments and suggestions received from the attendees which included several recommendations for NASA LaRC to evaluate alternatives to demolition. NASA LaRC confirmed that alternatives would be explored and made available to the public in the future.

Also in February 2005, NASA LaRC hosted a Section 106 consultation meeting on site to discuss the proposed demolitions and tour the facilities. In addition to the ACHP, representatives from the Smithsonian, the National Park Service (NPS), VASHPO, NASA Headquarters, Langley Air Force Base, and the Virginia Air and Space Center were in attendance. Following the meeting we received comments from the ACHP, VASHPO and the NPS recommending that NASA LaRC perform a complete analysis of alternatives to demolition.

Throughout 2005, NASA LaRC consulted with multiple outside organizations, groups, and agencies, such as the National Institute for Aerospace, Old Dominion University, the City of Hampton, and Langley Air Force Base to explore possible adaptive reuse or heritage tourism possibilities for Buildings 640, 641, 643, and 1146. Responses received cited either lack of need or funding to pursue viable reuse or heritage tourism opportunities.

In August of 2006, NASA LaRC submitted a status report on the demolition project to the ACHP, VASHPO, and the NPS. The comprehensive report provided background information on the actions taken by NASA since initiating consultation regarding the demolition project, the current status of the project (as of August 2006), and NASA's planned future actions and schedule. In accordance with the consultation requirements of the PA, the report concluded that NASA planned to prepare an analysis of alternatives to demolition for the four facilities. No comments were received from the ACHP, VASHPO or the NPS on the status report.

In May of 2007, NASA LaRC submitted the Alternatives Analysis Report to the ACHP, VASHPO, and the NPS. The report fully analyzed eight alternatives (including demolition) for Buildings 640, 641, 643 and 1146. The report concluded that demolition was the only viable option and thus the preferred alternative. No comments were received from the ACHP, VASHPO or the NPS on the Alternatives Analysis Report. NASA LaRC plans to issue an Environmental Assessment (EA) for the proposed demolitions for public comment and the Alternatives Analysis Report will be included as an appendix in the EA.

Mitigation (Stipulation III)

In addition to completing consultation in accordance with the terms of the PA as described above, NASA LaRC has carried out the following mitigation measures in accordance with Stipulation III of the PA:

A. Recordation: Level 1 HAER documentation has been completed for each facility and will be submitted to the ACHP, VASHPO, and the NPS within the next two weeks.

B. Coordination with the Smithsonian Institution for salvage of significant artifacts: NASA LaRC has consulted with the Smithsonian specifically regarding the salvage of a portion of the test cell from the 8-Foot Transonic Pressure Tunnel. The Curator of Aerodynamics at the Smithsonian's National Air and Space Museum (NASM) is in the process of submitting a proposal to the NASM's Collections Committee regarding the salvage of the test cell. The Curator is fairly confident that the proposal will be accepted. NASA plans to coordinate with the Smithsonian for salvage of additional items, such as models, tunnel fan blades, and other artifacts as part of the predemolition process.

In addition to the requirements of the PA, NASA LaRC is in the process of performing additional recordation of Buildings 640, 641, 643, and 1146 through the creation of a publicly accessible historic preservation website that includes:

- technical papers and video clips of research projects performed in the buildings;
- interviews with researchers; and
- ▶ history, photographs and virtual reality tours of each of the buildings.

NASA LaRC is in the process of expanding this preservation initiative by adding an educational element to the website that includes modules and exercises incorporating the Virginia Standards of Learning. Additionally, NASA plans to make information about this preservation initiative available to the public at the Virginia Air and Space Center located in Hampton, Virginia, which serves as LaRC's Official Visitor's Center.

In conclusion, NASA LaRC has performed consultation and carried out mitigation according to the terms of the PA. While demolition of Buildings 640, 641, 643, and 1146 will result in the loss of historic properties, NASA LaRC has provided and will continue to provide numerous opportunities, both locally and throughout the country, for public participation in and interpretation of NASA's history and legacy. The mitigation program that was developed and implemented, as described above, appropriately reflects the public's interest in these buildings and provides for on-going public access to materials documenting the history of the people and events associated with these buildings.

Having followed the process for consultation and mitigation outlined in the PA, and receiving no comment or objection from the ACHP, VASHPO, or NPS within the specified timeframes, NASA LaRC has concluded that it has met the terms of the PA. As such, NASA LaRC plans to begin demolition of Buildings 640, 641 and 1146 before the end of FY08 with the demolition of Building 643 to occur in the FY09-10 timeframe.

If you have any questions, please do not hesitate to contact me. We look forward to working with you on future projects in meeting the requirements of Section 106 of the National Historic Preservation Act of 1966, amended.

Sincerely,

Rodney T. Harris Center Master Planner Historic Preservation Officer

cc:

James Leatherwood, NASA CRM Senior Policy Officer, Director, EMD Tina Norwood, NASA Federal Preservation Officer, EMD National Aeronautics and Space Administration Langley Research Center Hampton, VA 23681-2199



March 12, 2008

Reply to Atin of: 300

Advisory Council on Historic Preservation Mr. Thomas McCulloch Historic Preservation Specialist 1100 Pennsylvania Avenue NW, Suite 803 Washington, D.C. 20004

Subject: Demolition of Buildings 640, 641, 643, and 1146 at NASA Langley Research Center, Hampton, Virginia, DHR No. 2002-1560

Dear Mr. McCulloch,

The purpose of this letter is to inform you that the National Aeronautics and Space Administration's Langley Research Center (NASA LaRC) has fulfilled the requirements of the Programmatic Agreement (PA) among the National Aeronautics and Space Administration, the National Conference of State Historic Preservation Officers, and the Advisory Council on Historic Preservation (ACHP), and is proceeding with demolition of the following four facilities at NASA LaRC located in Hampton, Virginia:

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Pursuant to the PA, NASA LaRC has consulted with the VASHPO and the ACHP in order to take into account the effect of the undertaking on historic properties. NASA LaRC has consulted in accordance with stipulation II and completed proposed mitigation measures in accordance with stipulation III of the PA. A summary of NASA LaRC's fulfillment of the stipulations of the PA follows:

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Throughout 2005, NASA LaRC consulted with multiple outside organizations, groups, and agencies, such as the National Institute for Aerospace, Old Dominion University, the City of Hampton, and Langley Air Force Base to explore possible adaptive reuse or heritage tourism possibilities for Buildings 640, 641, 643, and 1146. Responses received cited either lack of need or funding to pursue viable reuse or heritage tourism opportunities.

In August of 2006, NASA LaRC submitted a status report on the demolition project to the ACHP, VASHPO, and the NPS. The comprehensive report provided background information on the actions taken by NASA since initiating consultation regarding the demolition project, the current status of the project (as of August 2006), and NASA's planned future actions and schedule. In accordance with the consultation requirements of the PA, the report concluded that NASA planned to prepare an analysis of alternatives to demolition for the four facilities. No comments were received from the ACHP, VASHPO or the NPS on the status report.

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In addition to the requirements of the PA, NASA LaRC is in the process of performing additional recordation of Buildings 640, 641, 643, and 1146 through the creation of a publicly accessible historic preservation website that includes:

- technical papers and video clips of research projects performed in the buildings;
- ➢ interviews with researchers; and
- ▶ history, photographs and virtual reality tours of each of the buildings.

NASA LaRC is in the process of expanding this preservation initiative by adding an educational element to the website that includes modules and exercises incorporating the Virginia Standards of Learning. Additionally, NASA plans to make information about this preservation initiative available to the public at the Virginia Air and Space Center located in Hampton, Virginia, which serves as LaRC's Official Visitor's Center.

In conclusion, NASA LaRC has performed consultation and carried out mitigation according to the terms of the PA. While demolition of Buildings 640, 641, 643, and 1146 will result in the loss of historic properties, NASA LaRC has provided and will continue to provide numerous opportunities, both locally and throughout the country, for public participation in and interpretation of NASA's history and legacy. The mitigation program that was developed and implemented, as described above, appropriately reflects the public's interest in these buildings and provides for on-going public access to materials documenting the history of the people and events associated with these buildings.

Having followed the process for consultation and mitigation outlined in the PA, and receiving no comment or objection from the ACHP, VASHPO, or NPS within the specified timeframes, NASA LaRC has concluded that it has met the terms of the PA. As such, NASA LaRC plans to begin demolition of Buildings 640, 641 and 1146 before the end of FY08 with the demolition of Building 643 to occur in the FY09-10 timeframe.

If you have any questions, please do not hesitate to contact me. We look forward to working with you on future projects in meeting the requirements of Section 106 of the National Historic Preservation Act of 1966, amended.

Sincerely,

Rodney T. Harris Center Master Planner Historic Preservation Officer

cc:

James Leatherwood, NASA CRM Senior Policy Officer, Director, EMD Tina Norwood, NASA Federal Preservation Officer, EMD National Aeronautics and Space Administration Langley Research Center Hampton, VA 23681-2199



March 12, 2008

Reply to Attn of: 300

National Park Service Mr. William Bolger National Historic Landmarks Program Manager 200 Chestnut Street Philadelphia, PA 19106

Subject: Demolition of Buildings 640, 641, 643, and 1146 at NASA Langley Research Center, Hampton, Virginia, DHR No. 2002-1560

Dear Mr. Bolger,

The purpose of this letter is to inform you that the National Aeronautics and Space Administration's Langley Research Center (NASA LaRC) has fulfilled the requirements of the Programmatic Agreement (PA) among the National Aeronautics and Space Administration, the National Conference of State Historic Preservation Officers, and the Advisory Council on Historic Preservation (ACHP), and is proceeding with demolition of the following four facilities at NASA LaRC located in Hampton, Virginia:

- Building 640 [the 8-Foot Transonic Pressure Tunnel (TPT)],
- Building 641 [the 8-Foot High Speed Tunnel (HST) tunnel circuit only],
- Building 643 [the Full Scale Tunnel],
- Building 1146 [the 16-Foot Transonic Tunnel (TT) tunnel circuit and ten small support facilities]

Buildings 641 and 643 are listed National Historic Landmarks. NASA LaRC, in consultation with the Virginia Department of Historic Resources (VASHPO), has determined that Buildings 640 and 1146 are potentially eligible for listing in the National Register of Historic Places (NRHP) both individually, and as contributing resources to a proposed NASA LaRC Historic District.

Pursuant to the PA, NASA LaRC has consulted with the VASHPO and the ACHP in order to take into account the effect of the undertaking on historic properties. NASA LaRC has consulted in accordance with stipulation II and completed proposed mitigation measures in accordance with stipulation III of the PA. A summary of NASA LaRC's fulfillment of the stipulations of the PA follows:

Consultation Process (Stipulation II)

In July 2004, NASA LaRC initiated consultation with the ACHP and the VASHPO regarding NASA's proposal to demolish Buildings 640, 641, 643, and 1146. The consultation package included a letter describing the proposed demolition project, VASHPO project review forms, a map and photographs of the facilities, and a copy of the PA.

In addition to the consultation package described above, in August 2004, NASA LaRC sent scoping letters to fifteen local, state and federal agencies to elicit comments on the potential environmental and cultural resource impacts regarding the proposed demolitions. No negative comments were received.

In February 2005, NASA LaRC held a public meeting to provide a forum for the community to comment on the proposed demolitions. The meeting was publicized in the *Daily Press*, a local newspaper with regional circulation. Approximately 70 people, namely local residents and current and retired NASA LaRC employees attended the meeting. In addition to answering questions regarding the demolitions, NASA recorded comments and suggestions received from the attendees which included several recommendations for NASA LaRC to evaluate alternatives to demolition. NASA LaRC confirmed that alternatives would be explored and made available to the public in the future.

Also in February 2005, NASA LaRC hosted a Section 106 consultation meeting on site to discuss the proposed demolitions and tour the facilities. In addition to the ACHP, representatives from the Smithsonian, the National Park Service (NPS), VASHPO, NASA Headquarters, Langley Air Force Base, and the Virginia Air and Space Center were in attendance. Following the meeting we received comments from the ACHP, VASHPO and the NPS recommending that NASA LaRC perform a complete analysis of alternatives to demolition.

Throughout 2005, NASA LaRC consulted with multiple outside organizations, groups, and agencies, such as the National Institute for Aerospace, Old Dominion University, the City of Hampton, and Langley Air Force Base to explore possible adaptive reuse or heritage tourism possibilities for Buildings 640, 641, 643, and 1146. Responses received cited either lack of need or funding to pursue viable reuse or heritage tourism opportunities.

In August of 2006, NASA LaRC submitted a status report on the demolition project to the ACHP, VASHPO, and the NPS. The comprehensive report provided background information on the actions taken by NASA since initiating consultation regarding the demolition project, the current status of the project (as of August 2006), and NASA's planned future actions and schedule. In accordance with the consultation requirements of the PA, the report concluded that NASA planned to prepare an analysis of alternatives to demolition for the four facilities. No comments were received from the ACHP, VASHPO or the NPS on the status report.

In May of 2007, NASA LaRC submitted the Alternatives Analysis Report to the ACHP, VASHPO, and the NPS. The report fully analyzed eight alternatives (including demolition) for Buildings 640, 641, 643 and 1146. The report concluded that demolition was the only viable option and thus the preferred alternative. No comments were received from the ACHP, VASHPO or the NPS on the Alternatives Analysis Report. NASA LaRC plans to issue an Environmental Assessment (EA) for the proposed demolitions for public comment and the Alternatives Analysis Report will be included as an appendix in the EA.

Mitigation (Stipulation III)

In addition to completing consultation in accordance with the terms of the PA as described above, NASA LaRC has carried out the following mitigation measures in accordance with Stipulation III of the PA:

A. Recordation: Level 1 HAER documentation has been completed for each facility and will be submitted to the ACHP, VASHPO, and the NPS within the next two weeks.

B. Coordination with the Smithsonian Institution for salvage of significant artifacts: NASA LaRC has consulted with the Smithsonian specifically regarding the salvage of a portion of the test cell from the 8-Foot Transonic Pressure Tunnel. The Curator of Aerodynamics at the Smithsonian's National Air and Space Museum (NASM) is in the process of submitting a proposal to the NASM's Collections Committee regarding the salvage of the test cell. The Curator is fairly confident that the proposal will be accepted. NASA plans to coordinate with the Smithsonian for salvage of additional items, such as models, tunnel fan blades, and other artifacts as part of the predemolition process.

In addition to the requirements of the PA, NASA LaRC is in the process of performing additional recordation of Buildings 640, 641, 643, and 1146 through the creation of a publicly accessible historic preservation website that includes:

- > technical papers and video clips of research projects performed in the buildings;
- interviews with researchers; and
- history, photographs and virtual reality tours of each of the buildings.

NASA LaRC is in the process of expanding this preservation initiative by adding an educational element to the website that includes modules and exercises incorporating the Virginia Standards of Learning. Additionally, NASA plans to make information about this preservation initiative available to the public at the Virginia Air and Space Center located in Hampton, Virginia, which serves as LaRC's Official Visitor's Center.

In conclusion, NASA LaRC has performed consultation and carried out mitigation according to the terms of the PA. While demolition of Buildings 640, 641, 643, and 1146 will result in the loss of historic properties, NASA LaRC has provided and will continue to provide numerous opportunities, both locally and throughout the country, for public participation in and interpretation of NASA's history and legacy. The mitigation program that was developed and implemented, as described above, appropriately reflects the public's interest in these buildings and provides for on-going public access to materials documenting the history of the people and events associated with these buildings.

Having followed the process for consultation and mitigation outlined in the PA, and receiving no comment or objection from the ACHP, VASHPO, or NPS within the specified timeframes, NASA LaRC has concluded that it has met the terms of the PA. As such, NASA LaRC plans to begin demolition of Buildings 640, 641 and 1146 before the end of FY08 with the demolition of Building 643 to occur in the FY09-10 timeframe.

If you have any questions, please do not hesitate to contact me. We look forward to working with you on future projects in meeting the requirements of Section 106 of the National Historic Preservation Act of 1966, amended.

Sincerely,

Rodney T. Harris Center Master Planner Historic Preservation Officer

cc:

James Leatherwood, NASA CRM Senior Policy Officer, Director, EMD Tina Norwood, NASA Federal Preservation Officer, EMD


Preserving America's Heritage

April 7, 2008

Mr. Rodney T. Harris Center Master Planner Historic Preservation Officer Langley Research Center Hampton, VA 23681-2199

REF: Demolition of Buildings 640, 641, 643, and 1146, NASA's Langley Research Center

Dear Mr. Harris:

We have received your letter dated March 12, 2008 concerning NASA's plans to demolish the referenced four wind tunnels. Two of these buildings (641 and 643, the 8-Foot high Speed Tunnel and the Full Scale Tunnel) have been designated National Historic Landmarks (NHL) by the Secretary of the Interior. Your letter states that NASA intends to demolish all four of these historic properties pursuant to the 1989 Programmatic Agreement (PA) among NASA, the ACHP, and the National Conference of State Historic Preservation Officers.

However, as noted in the Preamble Clauses the terms of this PA only apply to the two NHLs proposed for demolition; it does not address adverse effects to properties that are simply listed on or have been determined eligible for listing on the National Register of Historic Places (in this case, Building 640, the 8-Foot Transonic Pressure Tunnel and Building 1146, the 16-Foot Transonic Tunnel). Absent some other agreement document for these properties, NASA will need to finalize its Section 106 compliance through a Memorandum of Agreement (MOA) under 36 CFR Section 800.6 of the ACHP's regulations, "Resolution of adverse effects," or failing to reach such an agreement, through ACHP formal comments per 36 CFR Part 800.7. The MOA would be developed with the Virginia State Historic Preservation Officer and set forth measures agreed upon to minimize or mitigate for the adverse effects of these buildings' removals.

Prior to execution of such a MOA for Buildings 640 and 1146, NASA should not take or sanction any action that could foreclose the ACHP's ability to comment on the undertaking, as required in Section 106 of the National Historic Preservation Act.

ADVISORY COUNCIL ON HISTORIC PRESERVATION

We look forward to working with you on this matter. Please contact Dr. Tom McCulloch at 202-606-8554 or via e-mail to <u>tmcculloch@achp.gov</u> to move forward with development of this MOA.

Sincerely, Reid J. Nelson

Assistant Director Federal Property Management Section Office of Federal Agency Programs



June 9, 2008

Reply to Attn of: 300

Ms. Joanna Wilson Archaeologist, Office of Review and Compliance Virginia Department of Historic Resources 2801 Kensington Avenue, Richmond VA 23221

RE: Demolition of Buildings 640 and 1146 at NASA Langley Research Center, Hampton, Virginia, VDHR File # 2002-1560

Dear Ms. Wilson

In accordance with 36 CFR § 800.6, regulations implementing Section 106 of the National Historic Preservation Act of 1966, as amended, the National Aeronautics and Space Administration, Langley Research Center (NASA LaRC) is continuing consultation to resolve potential adverse effects associated with the proposed demolition of Building 640 (the 8-Foot Transonic Pressure Tunnel, VDHR# 114-0165-0359) and Building 1146 (the 16-Foot Transonic Tunnel, VDHR# 114-5313-0010). In a letter dated March 12, 2008, we notified your office, the Advisory Council on Historic Preservation (ACHP) and the National Park Service (NPS) that NASA has fulfilled the requirements of the Programmatic Agreement (PA) among the National Aeronautics and Space Administration, the National Conference of State Historic Preservation Officers, and the ACHP, and is proceeding with demolition of Buildings 640, 641, 643 and 1146. In a letter dated April 7, 2008, the ACHP responded that the PA only addresses NASA's NHL's (Buildings 641 and 643) and that NASA LaRC will need to finalize Section 106 compliance for demolition of Buildings 640 and 1146 through a separate Memorandum of Agreement (MOA).

In consultation with your office (VASHPO), NASA LaRC has determined that Buildings 640 and 1146 are potentially eligible for listing in the National Register of Historic Places (NRHP) both individually, and as contributing resources to a proposed NASA LaRC Historic District. NASA LaRC has consulted with your office and the ACHP in order to take into account the effect of the undertaking on historic properties. As described in our March 12th letter, NASA has performed the following consultation regarding demolition of Buildings 640 and 1146, as well as Buildings 641 and 643:

Demolition of Buildings 640 and 1146 at NASA Langley Research Center, Hampton, Virginia, VDHR File # 2002-1560

In July 2004, NASA LaRC initiated consultation with the ACHP and the VASHPO regarding NASA's proposal to demolish Buildings 640, 641, 643, and 1146. The consultation package included a letter describing the proposed demolition project, VASHPO project review forms, a map and photographs of the facilities.

In addition to the consultation package described above, in August 2004, NASA LaRC sent scoping letters to fifteen local, state and federal agencies to elicit comments on the potential environmental and cultural resource impacts regarding the proposed demolitions. No negative comments were received.

In February 2005, NASA LaRC held a public meeting to provide a forum for the community to comment on the proposed demolitions. The meeting was publicized in the *Daily Press*, a local newspaper with regional circulation. Approximately 70 people, namely local residents and current and retired NASA LaRC employees attended the meeting. In addition to answering questions regarding the demolitions, NASA recorded comments and suggestions received from the attendees which included several recommendations for NASA LaRC to evaluate alternatives to demolition. NASA LaRC confirmed that alternatives would be explored and made available to the public in the future.

Also in February 2005, NASA LaRC hosted a Section 106 consultation meeting on site to discuss the proposed demolitions and tour the facilities. In addition to the ACHP, representatives from the Smithsonian, the National Park Service (NPS), VASHPO, NASA Headquarters, Langley Air Force Base, and the Virginia Air and Space Center were in attendance. Following the meeting we received comments from the ACHP, VASHPO and the NPS recommending that NASA LaRC perform a complete analysis of alternatives to demolition.

Throughout 2005, NASA LaRC consulted with multiple outside organizations, groups, and agencies, such as the National Institute for Aerospace, Old Dominion University, the City of Hampton, and Langley Air Force Base to explore potential adaptive reuse or heritage tourism possibilities for Buildings 640, 641, 643, and 1146. Responses received cited either lack of need or funding to pursue viable reuse or heritage tourism opportunities.

In August of 2006, NASA LaRC submitted a status report on the demolition project to the ACHP, VASHPO, and the NPS. The comprehensive report provided background information on the actions taken by NASA since initiating consultation regarding the demolition project, the current status of the project (as of August 2006), and NASA's planned future actions and schedule. The report concluded that NASA planned to prepare an analysis of alternatives to demolition for the four facilities. No comments were received from the ACHP, VASHPO or the NPS on the status report.

In May of 2007, NASA LaRC submitted the Alternatives Analysis Report to the ACHP, VASHPO, and the NPS. The report fully analyzed eight alternatives (including demolition) for Buildings 640, 641, 643 and 1146. The report concluded that demolition

Demolition of Buildings 640 and 1146 at NASA Langley Research Center, Hampton, Virginia, VDHR File # 2002-1560

was the only viable option and thus the preferred alternative. No comments were received from the ACHP, VASHPO or the NPS on the Alternatives Analysis Report.

In March of 2008, NASA LaRC sent letters to the ACHP, VASHPO, and the NPS informing them that NASA has fulfilled the requirements of the PA and plans to proceed with the demolitions. Comments were received from the ACHP that NASA will need to develop a separate MOA to demolish Buildings 640 and 1146.

In accordance with 36 CFR § 800.6(b)(1)(i), NASA LaRC proposes to resolve adverse effects associated with demolition of Buildings 640 and 1146 through execution of a MOA. A separate letter has been sent to the ACHP inviting their participation in the consultation process. The enclosed draft MOA provides for recordation and salvage of artifacts from the facilities. An electronic version of the document will be sent to you via email. NASA LaRC requests that you review the draft MOA and provide any comments you may have by July 11, 2008.

If you have any questions regarding this project please do not hesitate to contact me at 757-864-6118.

Sincerely,

Rodnéy Harris Master Planner Historic Preservation Officer

Enclosure

APPENDIX C Alternatives Analysis Report

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National Aeronautics and Space Administration Langley Research Center Hampton, VA 23681-2199



May 9, 2007

Hepty to Attn of 300

Dr. Ethel Eaton Manager, Office of Review and Compliance Virginia Department of Historic Resources 2801 Kensington Avenue Richmond, Virginia 23221

SUBJECT: Alternatives Analysis – Proposed Demolition of Facilities and Infrastructure at NASA Langley Research Center, Hampton, VA, DHR File No. 2002-1560

Dear Dr. Eaton,

The purpose of this letter is to continue consultation with your office regarding the proposed demolition of four wind tunnels at NASA Langley Research Center (LaRC). In order to fulfill our responsibilities under Section 106 of the National Historic Preservation Act of 1966, as amended, NASA has performed an evaluation of alternatives for the wind tunnel facilities. The attached report includes an analysis of the suggested alternatives you provided to us in your March 18, 2005 letter, as well as a copy of the Programmatic Agreement among NASA, the NCSHPO and the ACHP for use and management of NASA's National Historic Landmarks, and a map showing the location of the facilities.

The report identifies NASA's preferred alternative as demolition and the justification for this decision. NASA has determined that the preferred alternative will have an adverse effect on the properties. In order to minimize the adverse effect, NASA is proposing to carry out several mitigation measures which are also described in the report.

NASA requests your review of the enclosed information and response to our preferred alternative and proposed mitigation to minimize the adverse effects to the properties. A copy of the report has also been provided to the Advisory Council on Historic Preservation and the National Park Service for their review and comment.

Please contact me if you have any questions or comments regarding this project.

Cordially,

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Rodney T. Harris Center Master Planner Historic Preservation Officer

cc: William Bolger Thomas McCulloch Tina Norwood, NASA FPO Caroline Diekt

Enclosures

Alternatives Analysis Report Proposed Demolition of Facilities and Infrastructure at NASA Langley Research Center, Hampton, Virginia, DHR File No. 2002-1560

Introduction

This report has been prepared by NASA Langley Research Center (LaRC) to continue consultation under Section 106 of the National Historic Preservation Act (NHPA). This report analyzes alternatives to the proposed demolition of four wind tunnel facilities located at NASA LaRC in Hampton, Virginia. The four facilities are:

Building 640, the 8-Foot Transonic Pressure Tunnel Building 641, the 8-Foot High Speed Tunnel (*tunnel circuit only*) (DHR Id# 114 -0139) Building 643, the Full Scale Tunnel (DHR Id# 114 - 0142) Building 1146, the 16-Foot Transonic Tunnel (*tunnel circuit and 1146A-C, G-M*)

Buildings 641 and 643 are National Historic Landmarks (NHLs) and are part of a Programmatic Agreement (PA) between NASA, the National Conference of State Historic Preservation Officers (NCSHPO), and the Advisory Council on Historic Preservation (ACHP). The PA addresses NASA's use and management of its NHLs. The PA establishes categories of activities, consultation and mitigation measures that NASA must follow in order to comply with Section 106 and 110 of the NHPA regarding undertakings that may affect the NHL properties.. A copy of the PA is included in Appendix A.

Buildings 640, 641 and 643 are located in LaRC's East Area on Langley Air Force Base (LAFB) property. NASA facilities in the East Area are operated under a land use agreement with the Air Force that allows NASA "the right to use and occupy the …allotment areas for the purpose of constructing, using, operating and maintaining thereon, buildings, structures and utilities necessary in scientific research and experiments in the problems of flight." The agreement stipulates that upon revocation or relinquishment of the permit, NASA shall remove its property and restore the premises to a condition satisfactory to the officer having immediate jurisdiction over the premises. Buildings 640, 641 and 643 are also within a proposed Langley Field Historic District. NASA LaRC has determined that Building 640 is eligible for listing in the National Register of Historic Places (NRHP) both individually, and as a primary resource within the LAFB proposed historic district.

Building 1146 is located in LaRC's West Area, which contains the main portion of the Center's facilities. The two areas are three miles apart and are separated by the runways of LAFB. NASA LaRC has determined that Building 1146 is eligible for listing in the NRHP as a primary resource within the proposed historic district of LaRC's West Area, as defined in 1998 by Jody Cook, Architectural Historian with the National Park Service (NPS). The location of the buildings and the boundaries of the proposed historic districts are shown on the map included in Appendix B.

With the exception of Buildings 641 and 1146, the proposed undertaking would completely demolish the wind tunnel structures and associated infrastructure such as small support buildings. All real property improvements would be demolished down to and including slabs and foundation. Utilities would be capped below grade, and the property re-graded to match existing site contours. For Building 641, only the tunnel circuit would be demolished and NASA would transfer the office wing portion of the facility to the Air Force upon project completion. Building 1146 demolition activities would involve the steel tunnel circuit and associated support structures, 1146A-C and 1146G-M. The office portion of the facility and Buildings 1146D-F would remain.

The information contained herein supports ongoing consultation under Section 106 of the National Historic Preservation Act between NASA LaRC, the Virginia Department of Historic Resources (VDHR), the ACHP and the NPS, regarding potential adverse effects from the proposed undertaking. NASA has prepared this alternatives analysis to satisfy Stipulation II.A.1.d. of the PA which states that NASA shall provide the following documentation to the SHPO for review:

"a description of alternatives to the proposed action, which were considered, if any, and reasons not chosen."

Description of the Four Wind Tunnels

The following provides a brief history and current condition of the wind tunnel facilities.

The 8-Foot Transonic Pressure Tunnel (Building 640)

Building 640, the 8-Foot Transonic Pressure Tunnel (TPT) is located in NASA LaRC's East Area, on LAFB property. The 8-Foot TPT, which was completed in 1953, included a reinforced concrete closed circuit structure supported on steel and concrete columns, and a

three story tall, steel framed building containing offices and technician areas supporting tunnel The tunnel was capable of operations. operating at pressures between 0.1 and 2.0 atmospheres. and had sophisticated air temperature and humidity controls. The air speed in the test section could be continuously varied up to Mach 1.2, depending on the size of the testing model, while the addition of a new plenum section in 1958 increased the speed potential to Mach 1.3.



Current view of 8-Ft. TPT, looking Southeast

In the 1960s, the 8-Foot TPT was instrumental in the development of the revolutionary new supercritical airfoil. As a supersonic aircraft reaches the speed of sound, there is a point at which the air flowing over the wings reaches supersonic speeds while the plane itself is moving slower, causing a significant drag effect. Langley engineer Richard T. Whitcomb

achieved a major breakthrough while researching this problem, developing a new airfoil (or wing cross-section) shape that would allow the wing to reach a higher speed before the airflow over it reached the speed of sound. Whitcomb and his research team extensively tested this new design—what he termed the "supercritical airfoil"—in the 8-Foot TPT. By the mid-1970s, supercritical wings were being used in the design of a wide variety of commercial and military aircraft, greatly increasing their speed, range, fuel efficiency, takeoff and landing performance, and maneuverability.

Through the 1980s and 1990s, Langley engineers continued to use the 8-Foot TPT for testing, including evaluations of the space shuttle design, and experiments requiring subsonic and transonic capabilities. Facing a surplus of tunnels in the post-Cold War era, NASA finally closed the facility in 1996. Since that time, minimal maintenance has been performed on the facility. Currently, the wind tunnel is no longer operational and the exterior of the concrete wind tunnel circuit is beginning to spall, causing safety concerns for personnel working and parking within the area of the tunnel.

The 8-Foot High Speed Tunnel (Building 641)

Building 641, the 8-Foot High Speed Tunnel (HST), is located adjacent to the 8-Foot TPT in NASA LaRC's East Area. Completed in 1936, the 8-Foot HST included a reinforced concrete closed circuit structure supported on steel and concrete columns, and a two story tall, steel framed building containing offices and technician areas supporting tunnel operations. The 8-Foot HST was the world's first large high speed tunnel and it proved to be vital during World War II. Evaluating stability-control problems of the Lockheed P-38 Lightning fighter in the 8-Foot HST, Langley engineers devised the "dive recovery flap," a wedge-shaped flap on the lower surface of the wings that allowed sufficient lift for a pilot to pull out of steep dives. This ingenious feature subsequently was incorporated in the design of a number of U.S. fighter aircraft, including the P-38, the P-47 Thunderbolt, the A-26 Invader, the P-59 Airacomet (the first U.S. jet aircraft), and the P-80 Shooting Star.

In the postwar years, Langley physicist Ray H. Wright observed that interference from wind tunnel walls could be minimized by placing slots in the test section throat, a concept that came to be known as "slotted throat" or "slotted wall tunnel" design. By the end of 1948, the 8-Foot HST had been retrofitted with the new slotted test section configuration, allowing speeds in excess of Mach 1 (the speed of sound, or approximately 761 mph at sea level). In the mid-1950s, the 8-Foot HST facilitated important research in body/wing design for supersonic aircraft.



Current view of 8-Ft. HST, looking North

Langley engineer Richard Whitcomb used the tunnel to develop the revolutionary "area rule" principle that—in practical terms—prompted the use of a compressed, or "wasp-waisted," fuselage design for supersonic jet fighters, allowing them to break what was popularly known

as the "sound barrier." Whitcomb's once controversial area rule achieved widespread acclaim in the scientific community and the popular press, and he was awarded the Collier Trophy for the greatest achievement in aviation in 1955.

The 8-Foot HST continued in use until 1961, when it was deactivated by NASA. The facility was kept in operational condition until 1976 when critical tunnel parts, such as the fan blades, hub, nacelles, shaft, and turning vanes were removed and sent to Wright-Patterson Air Force Base in Ohio and used in the construction of a new facility. Since then, the 8-Foot HST building has been used as office and storage space by LAFB.

The historical significance of the facility and its many contributions to aerospace technology were recognized when it was designated a NHL in 1985 as part of the Man in Space Theme Study which was prepared by the NPS. As a follow on to the study, the NPS examined the preservation potential of the 26 sites that were identified as nationally significant within the context of the Man in Space Theme. Of the four groups established to rank the preservation potential of the sites, the 8-Foot HST was placed into Group 4, which includes inactive sites that lack much of their original historic fabric but are still significant because of important events that occurred there. The preservation potential identified that the Group 4 "sites can be allowed to further deteriorate, be demolished, or have their uses and functions changed if future programs warrant. Again, before any actions are taken, Section 106 and 110(f) compliance and adequate documentation and recordation must take place. Off-site interpretation should be provided." (excerpt from *Man in Space Study of Alternatives*, National Park Service, 1987).

Currently, the 8-Foot HST is no longer operational and the exterior surface of the tunnel circuit has serious degradation issues related to spalling and cracking concrete and exposed rebar, causing safety concerns for personnel working and parking within the area of the tunnel. In addition, the deteriorating exterior of the tunnel shell is not aesthetically pleasing and detracts from the overall viewscape.

The Full Scale (30- by 60-Foot) Tunnel (Building 643)

Building 643, the Full Scale Tunnel (FST) is located in NASA LaRC's East Area. Completed in 1931, the FST was the largest wind tunnel in the world at that time, the enormous exterior structure measured 434 feet long, 222 feet wide, and 90 feet high. The test section measured 30 feet high by 60 feet wide, and allowed the installation of aircraft with wingspans up to 40 feet. Early testing in the FST indicated unexpectedly high wind resistance caused by external aircraft components, prompting the government to send a steady stream of military aircraft to Langley for "drag cleanup tests." But the true value of the FST was realized when the U.S. entered World War II. The FST operated around the clock, seven days a week, during the war years. Virtually every high-performance fighter aircraft was evaluated in the FST, allowing for countless design improvements that gave American pilots a critical edge in combat.

The FST remained an important test facility for the National Advisory Committee on Aeronautics (NACA) and its successor, NASA, well into the jet age. Upgrades in 1977 and 1984 allowed the facility to continue testing aircraft whose technology and performance

could not be envisioned in the biplane era in which it was built. Numerous modern aircraft were tested in the FST, including the Harrier Vertical Takeoff and Landing (VTOL) fighter, the F-16 Fighting Falcon, the American supersonic transport, the X-29A forward swept wing

experimental fighter, the Lunar Landing Test Vehicle, and the Space Shuttle.

The historical significance of the FST and its many contributions to aerospace



technology were recognized when it was designated a NHL in 1985 as part of the Man in Space Theme Study. Similar to the 8-Foot High Speed Tunnel, the NPS examined the preservation potential of the FST and determined that the accessibility and visitor use potential of the tunnel was low, specifically, "restricted access, no public tours" (from *Man in Space Study of Alternatives*, National Park Service, 1987).

The oldest operating wind tunnel at Langley when NASA finally decommissioned it in October 1995, the facility gained a new lease on life under the terms of an innovative privatization program between Old Dominion University (ODU) and NASA. ODU began operations at the FST in October 1996, providing engineering research facilities for graduate students and private customers in the field of aircraft and automotive transportation. In addition to paying for electricity, ODU is responsible for the operations and maintenance costs associated with the interior of the FST. While NASA LaRC is responsible for the tunnel's exterior, NASA closed the facility in 1995 because the facility was no longer needed and funding was not available to continue operation/maintenance of the facility. As such, minimal maintenance has been performed on the exterior of the tunnel since 1995.

Given the wind tunnel's close proximity to the Back River, recent storms have caused significant flooding and damage within the facility. Interior repairs have been performed by ODU to maintain operational status of the wind tunnel. In the early 1990's, NASA replaced approximately 50% of the tunnel's roof with new metal roof panels. Currently, the remaining section of roof and the transite (asbestos) siding panels are severely deteriorated, causing serious health and safety concerns for personnel working in and around the facility.

The 16-Foot Transonic Tunnel (Building 1146)

Building 1146, the 16-Foot Transonic Tunnel (TT) is located in NASA LaRC's West Area. Becoming operational on December 5, 1941, just two days before the Japanese attack on Pearl Harbor, the facility included a steel framed closed circuit tunnel structure supported on steel columns, and an associated two story tall masonry building containing offices and technician areas which supported tunnel operations. During World War II, the tunnel was used to evaluate the cooling problems plaguing the air-cooled engines that powered virtually every U.S. fighter and bomber aircraft. Later in the war, testing focused on evaluating fullsized propellers and the shapes of the first atomic bombs. While the 16-Foot TT was never Langley's largest or fastest wind tunnel, it did play an important role in the postwar evolution of tunnel design. In the late 1940s, Langley physicist Ray H. Wright observed that the interference caused by wind tunnel walls could be minimized by placing slots in the test section throat, a concept that came to be known as "slotted throat" or "slotted wall tunnel" design. Testing this new design in the 16-Foot TT, Langley engineers found that it allowed for transonic speeds (up to and beyond the speed of sound, Mach 1, approximately 761 mph at sea level). The facility was retrofitted with a new slotted test section throat and re-powered to 60,000 hp in 1950.

The 16-Foot TT remained an important test facility through the Cold War era and beyond, with virtually every U.S. fighter design undergoing testing in the tunnel, including the B-58 Hustler, F-14 Tomcat, F-15 Eagle, F-18 Hornet, stealth F-117 Nighthawk, and B-1 Bomber, as well as the Apollo moon mission spacecraft, the Space Shuttle, the X-33 VentureStar space vehicle, the Navy Advanced Technology Fighter (NATF). The tunnel also supported experimental programs such as the Highly Maneuverable Aircraft Technology (HiMAT) and the Advanced Strike Technology Joint



(JAST). Rehabilitation efforts in 1969, 1977, and 1989-90 kept the 16-Foot TT equipped with state-of-the-art testing facilities, but with the end of the Cold War, NASA was faced with a surplus of tunnels across the country. Under the Wind Tunnel Enterprise program established in 1994, the 16-Foot TT provided testing facilities to clients in private industry such as Boeing, covering its \$10 million annual operating budget with customer fees. In 2004, the Rand Corporation presented an assessment of wind tunnel and propulsion test facilities to NASA and the Office of the Secretary of Defense. This report concluded that the 16-Foot TT represented a "borderline case." Although affordable and well utilized, it was deemed "technically weak," with its capabilities inferior to those of other facilities. Based on this recommendation, NASA closed the facility in 2004. Currently, the wind tunnel is no longer operational as the main drive motors and other significant interior operational equipment were removed and reused at other LaRC wind tunnel facilities. The exterior integrity of the wind tunnel circuit and associated office building remains intact and in good condition.

Analysis of Alternatives

Following NASA's Section 106 consultation in 2005 with the ACHP, VDHR and the NPS, VDHR provided eight suggested alternatives to demolition for NASA's consideration. (March 18, 2005 letter, included in Appendix C). The following sections analyze these possible alternatives. VDHR also recommended that NASA LaRC consider four issues for each alternative discussed: accessibility, feasibility, cost/benefit and security. These issues are summarized at the end of each alternative discussion. A ninth alternative, moving the facilities off of LaRC property, was not carried forward for analysis because of the impracticality and prohibitive cost of such a venture.

Alternative 1. Continued use by NASA LaRC. As noted above, the only wind tunnel that is currently operational is the FST. The testing and technological capabilities of both 8-Foot tunnels is obsolete, and that of the 16-Foot is inferior compared to other NASA wind tunnels. Currently, there is no NASA mission or national requirement or need to use any of these three wind tunnels (either as is, or with modified technology). Additionally, the costs would be prohibitive to bring the wind tunnels back to operational status. As such, continued use by NASA is not an acceptable alternative for the two 8-Foot and the 16-Foot tunnels. The FST was decommissioned by NASA in 1995 because the agency no longer had a use for the facility. NASA has determined that the wind tunnel has no current or foreseeable future use in supporting the Agency's mission and as such, continued use by NASA LaRC is not a viable alternative.

Accessibility. Continued use of the wind tunnels by NASA would not change the current general access to the facilities.

Feasibility. Continued use by NASA of the two 8-Foot and 16-Foot tunnels is not feasible because they have outdated or inferior technology, are inoperable, and the wind tunnels do not meet NASA's current needs for wind tunnel testing facilities. Continued use by NASA of the FST is not feasible as no current or foreseeable future need exists for the wind tunnel's testing capabilities.

Cost/Benefit. For the two 8-Foot and 16-Foot tunnels, general estimates to bring the facilities back to operational status are in the tens of millions for each facility. There would be no benefit to NASA in expending such resources on facilities that are no longer needed. Existing facilities either already meet these needs or would require much less expenditure on upgrades. For the FST, NASA does not have the funding to repair and maintain the facility. The current estimate to replace the severely deteriorated roof and transite siding is \$7.5 million. An alternative estimate, to repair the roof and repaint the transite is \$3.5 million. Continued use of the FST by NASA would require operations and maintenance funding that is essential for LaRC's mission critical facilities.

Security. Since the two 8-Foot tunnels and the FST are located on LAFB property, continued use by NASA could pose security issues, depending on the nature of the testing and the status of national security concerns. For the 16-Foot TT, continued use by NASA would not change the security situation at the facility.

Alternative 2. Third party use, either as originally intended or through adaptive reuse. NASA LaRC has solicited outside organizations and private industry regarding the possible use of the four wind tunnels, either as originally intended, for wind tunnel research or through adaptive reuse. Parties contacted include ODU, the City of Hampton, the Virginia Air and Space Center (VASC), the NASA Aeronautics Support Team, and the National Institute of Aerospace (NIA). The NIA includes a consortium of the following research centers: the Center for Adaptive Aerospace Vehicle Technology (University of Maryland), the Center for Planetary Atmospheric and Flight Sciences (North Carolina State University), the Center for Multifunctional Aerospace Materials (Virginia Tech), the Center for High Confidence Cooperative Systems (North Carolina A&T State University), the Center of Nanotechnology for Advance Sensors, Actuators and Microsystems (University of Virginia), and the Center for Aerospace Systems Engineering, Modeling and Simulation (Georgia Tech). While the organizations appreciated the opportunity to investigate the possible use of the facilities, they identified either the lack of need or desire to use the wind tunnels (either as originally intended or through adaptive reuse), or that the capital required to staff and operate the facilities was prohibitive. In cases where the lack of capital presented the obstacle to adaptive reuse, NASA also does not have the resources to subsidize third party use of their facilities. As such, third party use for the two 8-Foot and 16-Foot tunnels is not a viable alternative. While continued use of the FST by ODU appears to be a viable alternative, the severely deteriorated roof and asbestos transite siding pose serious health and safety concerns for NASA LaRC. Although these concerns have been identified to ODU, the university does not plan to perform the necessary repairs to the exterior of the facility. Due to the serious health and safety issues, and associated liability with continued operation of the facility, NASA has determined that this alternative is no longer viable.

Accessibility. General access issues regarding this alternative are addressed in the Security section below.

Feasibility. NASA has allowed third party use of several wind tunnels at LaRC in the past. This was possible because the facilities offered useful and needed research capabilities to third parties in conjunction with reasonable and manageable operation and maintenance costs. As many of NASA's buildings and structures are unique, special purpose facilities, a very narrow set of use and reuse possibilities exist. For the two 8-Foot and the 16-Foot tunnels, third party use is not feasible due to lack of need, interest or funding to repair/restore and operate the wind tunnels. For the FST, third party use has been feasible due to the current operating agreement between NASA and ODU. However, this agreement expires in 2009 and LAFB has identified a critical need for additional property for future Air Force mission initiatives. Also, as mentioned above, NASA has serious health and safety concerns regarding the severely deteriorating roof and asbestos siding. Since ODU does not intend to repair the roof and siding, NASA has determined that third party use is no longer feasible.

Cost/Benefit. As no third party has been identified with both the interest and funding to repair, maintain and operate the two-8-Foot and the 16-Foot tunnels, either as originally intended or through adaptive reuse, an evaluation of cost/benefit for this alternative is difficult to perform. While NASA would require reimbursement from the third party for maintenance and utility costs, NASA would not profit or benefit from this alternative. For the FST, currently NASA's annual cost for ODU operation of the facility is approximately \$22,000. The benefit to NASA for third party (ODU) operation of the FST is the continued use of a National Historic Landmark as an educational tool.

Security. Third party use of the wind tunnels would introduce additional security burden on LaRC. All personnel using the facilities would have to undergo a U.S. government background investigation. Additionally, since the two 8-Foot tunnels and the FST are located on LAFB property, additional security issues could arise depending on the nature of the testing and the current condition of national security. At times, national security conditions could preclude use of the facilities by third parties. For the 16-Foot TT, LaRC would have to approve and/or monitor the research projects being performed in the facility.

Alternative 3. Historic Site/Heritage Tourism Destination – under NASA Langley control. As a secure Federal facility, and following the events of September 11, 2001, NASA LaRC does not allow general public access on to the Center. All visitors must have a current LaRC or DoD badge or be accompanied by a badged escort. Only in unique situations are public tours of the Center allowed and these must be pre-arranged through the LaRC Office of External Affairs. Similar concerns exist for the wind tunnels located on LAFB property as national security issues would preclude turning the wind tunnels in to heritage tourism sites.

The VASC, located in downtown Hampton, serves as LaRC's official Visitors' Center (http://www.vasc.org/index.html) (and is also the visitor's center for LAFB). Under a Memorandum of Agreement, and in partnership with LaRC, the VASC has permanent exhibits that include the Adventures in Flight Gallery, Air and Spacecraft, and the Space Gallery, all of which showcase LaRC's contributions to aeronautics and the space program. NASA provides \$1.75 million annually in funding and grants to the VASC for permanent exhibits, educational resources, and traveling displays (e.g., the Virginia State Fair) to allow for public involvement in and interpretation of NASA's history and legacy. Over the years, NASA's partnership with the VASC has been extremely successful and operation of the visitors' center remote from LaRC property allows the public a much greater opportunity to appreciate NASA's history. Since its opening in 1992, the VASC has served over four This past year the VASC experienced a record breaking 438,000 million visitors. admissions, a seven percent increase compared to the previous year. The key elements to this growth have been the continued upgrading of exhibits, and the addition of interactive and state-of-the-art technologies, many of which involve NASA contributions. The VASC is the top attraction in Hampton, and the second most-visited science museum in Virginia. Since NASA is very committed and involved in supporting the VASC as NASA's off-site visitors'

center, NASA has determined that operating the wind tunnels as heritage tourism destination sites is not a viable alternative.

Accessibility. If the facilities were turned into a tourism destination, ADA accessibility modifications could be made, although the historic integrity of the tunnels would be affected. General access issues regarding this alternative are addressed in the Security section below.

Feasibility. Given the deteriorated condition of the two 8-Foot tunnels, and their location on Air Force property, operating them as a permanent heritage/tourism site is not feasible. Due to the health and safety issues associated with the FST, the restricted access to the FST and the 16-Foot TT, and the fact that LaRC's visitor center is located off site, NASA has determined that operating the FST and the 16-Foot TT as heritage/tourism sites is not feasible.

Cost/Benefit. NASA does not have the funding to repair and maintain the four wind tunnels as heritage/tourism sites. Typically, maintenance and repair funds for NASA buildings are provided by the projects and programs utilizing the structures, and since LaRC is no longer using the four wind tunnels, funding to operate them as heritage/tourism sites would compete with other NASA mission priorities. Aside from being viewed as a good steward of its historic resources, NASA would not benefit from turning the wind tunnels into tourist destinations and there would be no offset to the funds expended for operating the facilities as such.

Security. Operation of the wind tunnels as a heritage/tourism site would introduce an additional security burden on LaRC. Public tours require clearance through LaRC's Office of Public Affairs and visitors must be escorted at all times while on LaRC property. Restricted access and national security issues/concerns for the two 8-Foot tunnels and the FST on LAFB property would preclude operating them as heritage/tourism sites.

Alternative 4. Historic Site/Heritage Tourism Destination, operated by third party. Similar issues apply to this alternative as to #2 and #3 above. NASA has solicited outside organizations and groups regarding the possible adaptive reuse of the wind tunnels. No third party has offered to operate the wind tunnels as heritage tourism destinations. Also, the restricted access and additional security required for this alternative would be a burden to NASA LaRC and LAFB. The official visitor center for NASA LaRC (and LAFB) is located at VASC and as such, is available for public interpretation of the LaRC wind tunnels and research performed by NASA both in the past and presently.

Accessibility. If the facilities were turned into a tourism destination, ADA accessibility modifications could be made, although the historic integrity of the tunnels would be affected. General access issues regarding this alternative are addressed in the Security section below.

Feasibility. Operation of the facilities as heritage/tourism sites by a third party is not feasible. No third parties have shown an interest in operating the facilities as such.

Cost/Benefit. As no third party has been identified with both the interest and funding to repair, maintain and operate the wind tunnels as a heritage/tourism sites, an evaluation of cost/benefit for this alternative is difficult to perform. While NASA would require reimbursement from the third party for utility costs associated with operating the site, NASA would not profit or benefit from this alternative. Aside from being viewed as a good steward of its historic resources, NASA would not benefit from third party operation of the wind tunnels as heritage tourism sites.

Security. Operation of the wind tunnels by a third party as a heritage/tourism site would introduce an additional security burden on NASA LaRC and LAFB. Public tours at NASA require clearance through LaRC's Office of Public Affairs and visitors must be escorted at all times while on LaRC property. Similar security issues exist for the wind tunnels located on LAFB property. At times, national security conditions could preclude providing tours of the facilities.

Alternative 5. Repair/Maintenance. NASA's budget for the maintenance of facilities under its management has been steadily reduced in recent years, while at the same time pressure has increased to conduct cutting-edge research. Maintenance and repair funds for LaRC's buildings are typically provided by the projects and programs utilizing the structures, and since LaRC is no longer using the four wind tunnels, funding to repair and maintain them would compete with other NASA mission priorities. Expending funds on abandoned facilities that cannot help meet current NASA mission needs could affect the operation of other LaRC research facilities that are essential to the Agency's mission. Lack of adequate funding for proper maintenance of mission essential facilities could cause breakdowns, delays in tunnel testing, and most importantly, compromise the health and safety of LaRC personnel. Additionally, for the two 8-Foot and the 16-Foot tunnels, rough estimates to repair each are in the tens of millions of dollars. The preservation potential for the 8-Foot HST is extremely low, as noted in the Man in Space Study of Alternatives performed by the NPS in 1987. Similar issues exist for the adjacent 8-Foot TPT. For the FST, the operating agreement stipulates that ODU is responsible for all interior maintenance and repair of the facility. Repair and maintenance of the exterior is NASA's responsibility. As previously mentioned, the integrity of a portion of the roof and the transite siding on the exterior of the FST is beginning to fail, causing major safety and health concerns for those working in and around the facility. A general estimate to perform minimal repairs on the roof and siding to meet minimum safety requirements is \$3.5 million. NASA does not have the funding to repair and maintain a facility that no is no longer used to support the Agency's mission. Consequently, NASA has determined that expending resources to repair and maintain any of the four wind tunnels is not a viable alternative.

Accessibility. Repair and maintenance would not affect the general access to the facility.

Feasibility. NASA has determined that repair and maintenance of the wind tunnels is not feasible. The facilities are no longer needed and NASA has determined that expending resources on unneeded infrastructure is not a sound management practice.

Cost/Benefit. Aside from being viewed as a good steward of its historic resources, NASA would not benefit by repairing and maintaining unneeded facilities. NASA has determined that the money that would be required for this alternative is critical funding that needs to be spent on mission essential facilities.

Security. There would be no change in security requirements if NASA were to repair and maintain the facility.

Alternative 6. Mothballing (to National Park Service Standards). This alternative encounters similar issues to #5 above. While the cost to mothball the facilities has yet to be determined, funding for any type of maintenance or repair of facilities is very limited. NASA has determined that it is not a sound management practice to expend resources to mothball facilities. Additionally, the two 8-Foot tunnels and the FST are located on leased LAFB property. The land use permit between NASA and the Air Force provides for NASA to use the property for aeronautics and space flight research. Given the fact that NASA no longer operates the three wind tunnels, NASA intends to comply with the relinquishment stipulations of the permit and as such, NASA "shall, within such reasonable time as the Secretary of the Air Force may indicate, remove its property from the reservation and restore the premises hereby authorized to be used and occupied to a condition satisfactory to the said officer." Since this stipulation does not support mothballing, NASA has determined that this alternative is not viable.

Accessibility. General access to a mothballed facility would only be allowed to authorized personnel.

Feasibility. NASA does not believe that mothballing unneeded and unused buildings is a sound management practice. In addition, since the two 8-Foot tunnels and the FST are on land leased from LAFB, NASA has determined that mothballing the wind tunnels is not a feasible alternative.

Cost/Benefit. Aside from being viewed as a good steward of its historic resources, NASA would not benefit by mothballing unneeded facilities. NASA has determined that the money that would be required for this alternative is critical funding that needs to be spent on mission essential facilities.

Security. There would be no change in security requirements if NASA were to mothball the facilities.

Alternative 7. No Action. This alternative would require the least expenditure of resources for NASA LaRC. Currently, the two 8-Foot tunnels located on LAFB property are in disrepair and pose a serious safety hazard due to spalling of the exterior concrete shell. As previously mentioned, for the FST, the integrity of the roof and transite siding is seriously

compromised, causing significant safety and health concerns, especially regarding potential asbestos exposure. The no action alternative would result in continued deterioration of these facilities and continued safety concerns in a highly visible and congested area of LAFB. Additionally, since the wind tunnels are historic properties, this alternative would cause NASA to be out of compliance with the NHPA. Allowing a historic property to deteriorate through neglect is considered an adverse impact and as such would require mitigation. Similar issues described in #6 with the NASA and LAFB land use permit apply to this alternative. As such, NASA has determined that the No Action alternative is not acceptable for the three wind tunnels located on LAFB property. For the 16-Foot TT, it appears that the No Action alternative is viable as this would not impact NASA's resources for mission essential facilities, however, the exterior of the facility, over time, would deteriorate (e.g., rust) and become an eye sore in a highly visible area of LaRC.

Accessibility. General access to an unoccupied, unused building would only be allowed to authorized personnel.

Feasibility. Continuing current management practices is feasible, but will not further NASA's mission.

Cost/Benefit. While taking no action would require the least expenditure of resources, NASA would not benefit from this alternative as the facilities would continue to deteriorate. There would be minimal costs incurred by NASA as periodic maintenance would still be performed to check the emergency lighting and fire systems within the facilities. Additionally, LAFB would not benefit from this alternative as the two 8-Foot tunnels and the FST are on land that could be used for future Air Force development or initiatives.

Security. There would be no change to the current security requirements.

Alternative 8. Demolition. NASA as an agency has been directed by the Administration to reduce infrastructure (see the March 1997 Presidential Decision Directive/National Science and Technology Council, "Status of Federal Laboratory Reform" available at: <u>http://www.fas.org/irp/offdocs/pdd5status.html</u>). As such, the Agency must plan for the disposal of some of its assets which includes the demolition of certain facilities where the cost/benefit analysis favors such an outcome and where no reasonable alternative can be found. While funds for general facility maintenance come from LaRC, the funding to demolish the wind tunnels would come from NASA Headquarters. To meet mission goals, NASA LaRC must ensure its associated demolition needs are part of NASA Headquarters' planning process.

NASA has determined that demolishing the wind tunnels would achieve the following:

- remove aging facilities that are no longer operational or needed to support NASA's mission;
- reduce expenditure of maintenance funds on unused facilities;

- satisfy the stipulations of the land use agreement between NASA and the Air Force (for the two 8-Foot tunnels and the FST)
- help to alleviate a critical shortage of available land for Air Force initiatives.

Accessibility. Demolition would obviate the need for general access or ADA accessibility.

Feasibility. NASA LaRC has determined that demolition of the wind tunnels is a feasible alternative. The existing Programmatic Agreement for management of NASA's National Historic Landmarks provides the measures to mitigate the loss of the resources as a result of demolition. Additionally, the funding for demolition would be provided by NASA HQ.

Cost/Benefit. The general estimates to demolish the two 8-Foot and the 16-Foot tunnels is \$1 million each. The estimate for the FST for demolition is approximately \$5 million. The cost to demolish the facilities is well below the estimates to repair the wind tunnels to operational status and the funding would be provided by NASA HQ. LaRC would benefit from demolishing the wind tunnels by reducing unneeded infrastructure and freeing up resources to support the Agency's mission. This benefit would be balanced by the loss of historic properties.

Security. Demolition of the wind tunnels would not have an effect on the security at NASA LaRC.

Preferred Alternative

Like many Federal facilities that conduct highly technical research, NASA is challenged to strike a balance between preserving the Agency's cultural and historic resources and making efficient and responsible use of funding in order to carry out NASA's mission. Upon analysis of the above alternatives, NASA LaRC has determined that demolition of the wind tunnels is the preferred alternative. It is important to note that this decision was not made without serious consideration and evaluation of alternatives. As an agency, NASA is currently undergoing a monumental transformation in both business practices and mission. To successfully execute the President's Vision for Space Exploration, NASA must refocus its organization, and realign programs, personnel and resources while continuing to comply with federal laws such as NHPA. A major component of this transformation will involve phasing out under-utilized buildings and facilities as mandated by the Administration, and making improvements to key infrastructure that supports the new vision. NASA plans to meet these future needs while preserving its history through carrying out mitigation measures to minimize the adverse impacts resulting from demolition of the wind tunnels.

Mitigation Measures

NASA is committed to preservation of its historic resources wherever it is realistically feasible and compatible with the Agency's goals and overall mission. Demolition of the wind tunnels would result in adverse impacts to historic properties. In accordance with the

Stipulation III of the PA among NASA, the NCSHPO and the ACHP for management of NASA's NHL's (Attachment A), NASA plans to carry out the mitigation measures prior to demolition of the wind tunnels. Specifically, NASA proposes to carry out the following mitigation measures to minimize the adverse effect of demolition:

- 1. Prepare HAER Level 1 documentation of each wind tunnel to properly record the history and contributions the facilities made to NASA's legacy.
- 2. Further document the facilities by obtaining panoramic interior photographs and aerial spherical exterior photographs of the wind tunnel to create virtual tour data for the Center's Master Plan web page.
- 3. Apply the agreement with the Smithsonian Institution (Smithsonian) to determine appropriate retention and curation activities with respect to significant artifacts that may be salvaged from the wind tunnels.

Specific to the last mitigation measure listed above, in order to preserve one of the truly significant artifacts of NASA's legacy, LaRC is proposing to salvage the test cell from the 8-Foot TPT, where Roger Whitcomb developed the revolutionary "supercritical airfoil" design. In the Fall of 2006, LaRC senior management contacted Dr. John Anderson, Aerodynamics Curator at the Smithsonian's National Air and Space Museum (NASM), regarding the salvage project. While the bulk of Dr. Anderson's career was in the Aerospace Engineering Department at the University of Maryland, he had grants with LaRC for many years supporting the Hypersonic Propulsion Branch. During a site visit at LaRC in December of 2006, Dr. Anderson expressed a keen interest in the prospect of salvaging the test cell from the 8-Foot TPT for display at the NASM, and he recently submitted an acquisitions proposal to the Collections Committee at the Smithsonian.

NASA recognizes that salvage of the test cell would be a rather monumental undertaking, given its size and weight. The test section is made up of four steel pieces, weighs 144,710 pounds, and is 28 feet by 13.5 feet. This large component would require considerable precision deconstruction, transportation to the NASM, and re-assembly. NASA believes that the benefits of displaying the test section at the NASM would outweigh the logistical issues and costs associated with the salvage and help to mitigate the adverse effect of demolition of the 8-Ft. TPT. Currently, no opportunity exists for public interpretation and appreciation of the test section, as the facility is abandoned and no public access is permitted onto LAFB property. As the NASM has over 9 million visitors annually, NASA believes that removal of the test section for display is a very prudent way to preserve and appreciate this historically significant artifact.

Conclusion

NASA recognizes that today's mission and program rest on events dating back to the days of NACA and before. While many of these historic achievements are represented in the aircraft and equipment used by pilots and astronauts throughout the years, the physical environment, including the four wind tunnels, provide a tangible context to remind us of our past. While demolition of the wind tunnels would result in the significant loss of historic resources, NASA has ensured that numerous opportunities exist both locally and throughout the country

for public participation in and interpretation of NASA's history and legacy. As previously described, NASA provides significant support annually to the VASC and their operation as NASA LaRC's Visitors' Center. Nationally, NASA actively participates in providing artifacts to the National Air and Space Museum and other venues to allow for public appreciation and viewing of NASA's history.

NASA strives to be a good steward of the mission-critical resources entrusted to us by the American public. As such, we must focus those resources, including funding, on supporting current mission requirements and preserving the most significant of past mission contributions. Fulfilling our commitments with the International Space Station, retiring the Space Shuttle in 2010, and developing the Crew Exploration Vehicle for missions to the Moon, Mars, and beyond are extremely challenging goals. As such, NASA must work creatively to preserve our past while still preparing for our future.

References

U.S. Department of Interior, National Park Service. 1987. *Man in Space Study of Alternatives*. <<u>http://www.cr.nps.gov/history/online_books/butowsky3/space4a.htm</u>>

Park, Sharon C. 1993. National *Park Service Preservation Brief 31, Mothballing Historic Buildings.* <<u>http://www.cr.nps.gov/hps/tps/briefs/brief31.htm</u>>

NASA. 1996. NASA-DoD Major Facilities Integrated Product Team (MFIPT) Report, dated June 10, 1996. <<u>http://www.hq.nasa.gov/office/codej/codejx/ipt.htm</u>>

U.S. Government Accounting Office. 1996. Report to the Chairman, Subcommittee on National Security, International Affairs, and Criminal Justice, Committee on Government Reform and Oversight, House of Representatives, *NASA Infrastructure: Challenges to Achieving Reductions and Efficiencies*, Appendix II http://www.gao.gov/archive/1996/ns96187.pdf

Presidential Decision Directive, National Science and Technology Council, 1997. *Status of Federal Laboratory Reform.* <<u>http://www.fas.org/irp/offdocs/pdd5status.html</u>>

RAND. 2004. An Assessment of NASA's Capabilities to Serve National Needs <<u>http://www.rand.org/pubs/monographs/2004/RAND_MG178.pdf</u>>

Appendix A

Programmatic Agreement Among the National Aeronautics and Space Administration, the National Conference of State Historic Preservation Officers, and the Advisory Council on Historic Preservation THIS PAGE LEFT BLANK INTENTIONALLY

PROGRAMMATIC AGREEMENT AMONG THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, THE NATIONAL CONFERENCE OF STATE HISTORIC PRESERVATION OFFICERS, AND THE ADVISORY COUNCIL ON HISTORIC PRESERVATION

WHEREAS, the National Aeronautics and Space Administration (NASA) undertakes research, development, space mission operations, and management use of its facilities which have been designated as National Historic Landmarks (Landmarks) (Attachment 1); and

WHEREAS, such facilities require frequent modification over the life of agency missions to adapt them to meet the requirements of ongoing NASA programs; and

WHEREAS, NASA has determined that such modifications may have an effect on those Landmarks, and has consulted with the National Conference of State Historic Preservation Officers (NCSHPO) and the Advisory Council on Historic Preservation (Council) pursuant to the regulations (36 CFR Part 800) implementing Sections 106 and 110(f) of the National Historic Preservation Act, as amended (16 U.S.C. 470f and 470h-2(f)); and

WHEREAS, the Department of the Interior, National Park Service (NPS) was invited and participated in the consultation;

NOW, THEREFORE, NASA, the NCSHPO, and the Council agree that the programs shall be implemented in accordance with the following stipulations in order to take into account the effect of the programs and specific undertakings on the Landmarks.

Stipulations

NASA will ensure that the following measures are carried out.

I. Categories of Activities

A. When the proposed undertaking involves any of the following activities, NASA shall consult with the appropriate SHPO and, as necessary, the Council in accordance with Stip. II:

 Demolition, dismantling, or relocation of original engineering structures, or of buildings housing facilities;
Removal or excessing of significant elements of the Landmarks specifically named on the National Register nomination forms;

3. New construction not compatible with major portions of the original structure or which alter the characteristics of the

facility which were specified as the reason for its Landmark designation; or

4. Changes in function, purpose, or use of a facility.

When the proposed undertaking is limited to the following в. activities that will not alter the characteristics of the facility which were specified as the reason for its landmark designation, NASA shall develop and implement mitigation measures in accordance with Stipulation III:

1. Replacement of historic hardware or components;

2. Modification of the original structure or equipment used in engineering structures, or buildings housing facilities; or

New construction compatible with existing structure, 3. purpose, and operation of the facility.

NASA shall include a description of such activities and mitigation measures in the annual summary of its activities prepared pursuant to Stipulation IV.A.

C. When the proposed undertaking involves none of the activities specified above, NASA may proceed without consultation or the implementation of mitigation measures.

II. Consultation Process

A. Consultation required under Stip. I.A. shall be conducted as follows:

1. NASA shall provide the following documentation to the SHPO for review:

a. a description of the undertaking, with photos, maps, and drawings;

 b. a description of the affected Landmark;
c. a description of the effects of the undertaking on the affected Landmark;

d. a description of alternatives to the proposed action, which were considered if any, and reasons not chosen;

e. a description of any mitigation measures proposed;

f. a description of NASA's effort, if appropriate, to obtain and consider views of affected interested persons on the proposed undertaking, including a copy of any comments received; and

g. the planning and approval schedule for the proposed undertaking.

Whenever feasible, NASA shall give the SHPO advance notice that such documentation is under preparation, and advise the SHPO of a date certain that it intends to submit the documentation to the SHPO.

 The SHPO shall respond to a written request for consultation (accompanied by the documentation specified in Stip. II.A.1) within 20 working days, and agree, conditionally agree, or disagree with NASA's proposal.

3. If NASA does not accept the SHPO's conditions, or if NASA and the SHPO disagree, NASA shall notify the Council and forward copies of the documentation specified in Stip.II.A.1, above, along with other information relevant to the dispute.

4. Within 20 working days, the Council shall either: (1) attempt to resolve the dispute; (2) provide NASA with recommendations to be taken into account in implementing the activity; or (3) decide to comment, and comment within 45 working days of that decision. At NASA's request, the time periods in Stips. II.A.2. and II.A.4. will run concurrently. In exceptional circumstances NASA may request accelerated consideration under Stip. II.A.4. and the Council will make a good faith effort to accommodate such requests. The Council may consult with the National Park Service of the Department of the Interior during its review period.

B. The Council and the NCSHPO recognize that operational emergency situations may arise where NASA must take immediate action without prior consultation with the appropriate SHPO or the Council. In such situations, NASA shall notify the Council and the SHPO of such actions as soon as practicable.

III. Mitigation

Mitigation measures shall be carried out prior to undertaking actions specified in Stips. I.A. and I.B.

A. Recordation

 Recordation shall be done in accordance with the Secretary of the Interior's "Standards for Architectural and engineering Documentation" (Standards) (<u>Federal Register</u>, 48 FR 190, pp. 44730-44734, September 29, 1983).

2. Because original "as-built" drawings and other records are on file at the installations containing Landmark facilities, documentation will normally include the following: (1) reproduction of existing "as-built" drawings and site plans modified on standard size (19 x 24 or 24 x 36) mylar; and (2) provision of black and white archival quality photos with large format negatives of exterior and interior views, as appropriate, as well as special technological features or engineering details.

3. Original copies of all documentation shall be provided to the Secretary of the Interior in accordance with the Standards for incorporation into the National Architectural and Engineering Records in the Library of Congress as provided in Section 101 of the National Historic Preservation Act and implementing procedures. Copies of the documentation shall also be provided to the appropriate SHPO.

B. Salvage

NASA will apply its agreement with the Smithsonian Institution (NASA Management Instruction 4310.4) to determine appropriate retention and curation activities with respect to significant artifacts.

IV. Continuing Coordination

A. On or about December 1, 1990, and annually thereafter, NASA will provide a summary of its activities under this Agreement to the Council and to the NCSHPO.

B. In consultation with the appropriate SHPO, the Council may review and comment upon individual undertakings when it determines that historic preservation issues warrant such action.

C. NASA will provide appropriate public information about activities under Stip.I.A. to interested parties upon request.

D. Any party to this Agreement may terminate it by providing 60 days notice to the other parties, provided that the parties will consult during the period prior to termination to seek agreement on amendments or other actions that would avoid termination.

Execution of this Programmatic Agreement and carrying out its terms evidences that NASA has afforded the Council and the NCSHPO a reasonable opportunity to comment on its programs affecting Landmarks under Sections 106 and 110(f) of the National Historic Preservation Act, and that NASA has taken into account the effects of its programs on these Landmarks.

NATIONAL AEROMAUTICS AND SPACE ADMINISTRATION By: Associate Administrator for Management NATIONAL CONSERENCE OF STATE HISTORIC PRESERVATION OFFICERS All L'Elem By: President Date ADVISORY COUNCIL ON HISTORIC PRESERVATION 0 BV1: Chairman Date

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ATTACHMENT 1

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NASA'S NATIONAL HISTORIC LANDMARKS

(as of 2/24/89)

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Appendix B

Map Showing Demolition Locations

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Location of Proposed Demolitions at NASA Langley Research Center
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Appendix C

Letter from the Virginia Department of Historic Resources THIS PAGE LEFT BLANK INTENTIONNALY



COMMONWEALTH of VIRGINIA

W. Tayloe Murphy, Jr. Secretary of Natural Resources

Department of Historic Resources

2801 Kensington Avenue, Richmond, Virginia 23221

March 18, 2005

Kathleen S. Kilpatrick Director

Tel: (804) 367-2323 Fax: (804) 367-2391 TDD: (804) 367-2386 www.dhr.virginia.gov

Mr. Kenneth M. Kumor Environmental Management Division Mail Suite 6V79 NASA Headquarters 300 E Street, SW Washington, DC 20546

Re: Proposed Demolition of Various Buildings and Infrastructure NASA Langley Research Center DHR File # 2002-1560

Dear Mr. Kumor:

We write to you in response to your proposal to demolish five wind tunnel structures, the Gantry crane, and associated buildings. We appreciated the opportunity to visit with you and your staff on site and examine each of the structures in detail. As suggested, this letter is intended to guide you as you begin the Section 106 process giving consideration to all options and alternatives available to you. Three of the structures proposed for demolition have been recognized as National Historic Landmarks and the remaining three are potentially eligible for listing on the National Register of Historic Places. All of these structures are therefore considered "historic properties" according to Section 106 of the National Historic Preservation Act of 1065, as amended, and their demolition will result in an adverse effect. Because three of the structures rise to a higher level of significance as indicated by their recognition as NHLs, their demolition would be a national loss of sobering proportions. Section 106 regulations require the federal agency to consult with both the Advisory Council on Historic Preservation and the Secretary of the Interior as they strive "to the maximum. extent possible ... [to] minimize harm to any National Historic Landmark" (36 CFR800.10). As we mentioned during our meeting on February 10, 2005, in order to fulfill its responsibilities under Section 106, NASA must fully investigate and evaluate alternatives to demolition. Although demolition may be one such alternative it cannot be presented as the only solution. We have attached a bulleted list of potential alternatives as well as a brief discussion of other issues we recommend that you consider during your evaluation.

NASA must consult with all interested parties throughout the evaluation process. This requirement is designed both to ensure that the comments and opinions of these parties are considered and to provide you with the opportunity to take advantage of the specialized knowledge that these parties may have. The National Park Service, the Advisory Council on Historic Preservation, and the

Administrative Services 10 Courthouse Avenue Petersburg, VA 23803 Tel: (804) 863-1024 Fax: (804) 862-6196 Capital Region Office 2801 Kensington Ave. Richmond, VA 23221 Tel: (804) 367-2323 Fax: (804) 367-2391 Tidewatar Region Office 14415 Old Courthouse Way, 2^{re} Floor Newport News, VA 23608 Tel: (757) 886-2807 Fax: (757) 886-2808 Roanoke Region Office 1030 Penmar Ave., SE Roanoke, VA 24013 Tel: (540) 857-7585 Fax: (540) 857-7588 Winchester Region Office 107 N. Kent Street, Suite 203 Winchester, VA 22601 Tel: (540) 722-3427 Fax: (540) 722-7535 Mr. Kenneth M. Kumor Proposed Demolitions, NASA/LaRC Facility March 18, 2005 Page 2

Smithsonian Institution have all indicated an interest in this process. You must also provide the public with an opportunity to comment upon any alternatives under consideration. We ask that you provide DHR with copies of correspondence you receive from interested parties. As landowner of record, Langley Air Force Base must be involved in all aspects of this process.

We appreciate your initiating this preliminary meeting to allow the consultative process to begin, and look forward to working with your agency. If you have any questions about the Section 106 review process or our comments, please call me at (804) 367-2323, Ext. 140.

Sincerely,

i ane Un

Joahna Wilson, Archaeologist Office of Review and Compliance

cc: Mr. Rodney Harris, NASA Langley Research Center

Attachments (2)

Attachment 1: Suggested Alternatives for Consideration (Investigation should include, but should not be limited to, the options listed below)

- 1. Continued Use by NASA/Langley
- 2. Third Party Use either as originally intended or through adaptive reuse
- 3. Historic Site/Heritage Tourism Destination under NASA/Langley control
- 4. Historic Site/Heritage Tourism Destination operated by third party
- 5. Repair/Maintenance
- Mothballing (to National Park Service standards see Preservation Brief No. 31: "Mothballing Historic Buildings").
- 7. No Action

4

8. Demolition

For each option we recommend that you consider the following issues: accessibility, feasibility, cost/benefit, security. Please be prepared to present a thorough discussion of each alternative, to include identification of a preferred alternative or alternatives and justification for this decision.

Attachment 2: Other Items for Consideration

- Langley Air Force Base must become an active partner in this discussion as soon as possible. It is important to determine whether or not the existing land transfer agreement with Langley expressly prohibits preservation of the structures in question. Consideration must be given to the historic nature of these buildings by *all* parties involved in the discussion.
- 2. Three of the properties under consideration are listed as National Historic Landmarks for their contributions to the history of the American space program. NHLs are considered to be the "best of the best" and decisions regarding their preservation must take their uniqueness into account. Planning should involve recognition of the long-term effects of decisions regarding the fate of these structures.
- 3. Each of the properties, and the NHLs in particular, must be evaluated in terms of their individual merit as well as their collective contribution to NASA's legacy. Evaluators must keep this legacy in mind, and consider what impact the removal of these iconic structures may have upon it. Can photographs, documents and artifacts be enough to convey the full story? Will NASA and the American public look back in fifty years and regret the decisions made now? Keep in mind that, by your own admission, "There is nothing like being there" when it comes to the NASA experience. The power of place is important.
- 4. The National Park Service and the Advisory Council are both strongly opposed to demolition, and consider it to be the option of last resort. Historic American Engineering Records on the NHL properties are minimal. The NPS has, as well, presented the opinion that, at minimum, the 8 foot and full scale tunnels should be preserved as each structure in and of itself is an artifact.
- 5. A comment was made during our meeting that NASA should refrain from making security decisions based upon current security concerns and national "threat levels", as these situations can change at any time. Again, all options should remain on the table and plans should be made with both current and future needs in mind.
- Known archaeological sites exist adjacent to the Gantry crane, and others may exist adjacent to the remaining structures as well. Please keep this in mind during consideration of alternatives.
- 7. When considering alternatives, keep in mind that demolition will require extensive documentation and research. If demolition is determined to be the preferred alternative, and if this decision can be justified to the satisfaction of the consulting parties, we suggest that NASA provide several options for documentation. (For example, a suggestion was made during the meeting to record oral histories from employees who built and worked within the wind tunnels and with the Gantry.)

END