NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
NASA CONTRACT NO. NASW-4598
NASA TASK ASSIGNMENT NO. 49

ENVIRONMENTAL ASSESSMENT
COMBINED LOADS TEST SYSTEM (COLTS)

LANGLEY RESEARCH CENTER
HAMPTON, VIRGINIA

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Prepared by

Ebasco Services Incorporated
Arlington, Virginia

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LIST OF ACRONYMS

ACT	Advanced Composites Technology
ACHP	Advisory Council on Historic Preservation
ASIP	Airframe Structural Integrity Program
CRMP	Coastal Resources Management Program
COLTS	Combined Loads Test System
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
dBA	Decibels, A-Weighted Scale
DEQ	Department of Environmental Quality
EA	Environmental Assessment
EPA	Environmental Protection Agency
FONSI	Finding of No Significant Impact
FY	Fiscal Year
HRSD	Hampton Roads Sanitation District
HSR	High Speed Research
HSCT	high-speed civilian transport
LaRC	Langley Research Center
LHB	Langley Handbook
MSL	mean sea level
MSA	Metropolitan Statistical Area
mg/kg	milligram per kilogram
NASA	National Aeronautics and Space Administration
NHB	NASA Handbook
NHLs	National Historic Landmarks
NEPA	National Environmental Policy Act
NASP	National Aerospace Plane
NPDES	National Pollutant Discharge Elimination System
PCBs	polychlorinated biphenyls
PAHs	polynuclear aromatic hydrocarbons
ppm	parts per million
RFSGS	refuse-fired steam generating facility
SIP	State Implementation Plan
SHPO	State Historic Preservation Officers
SST	supersonic transport
TSCA	Toxic Substances Control Act
TCLP	Toxicity Characteristic Leaching Procedure
VOCEC	Volatile Organic Compound Emission Control

1.0 SUMMARY AND CONCLUSIONS

The proposed action is designed to support the National Aeronautics and Space Administration's (NASA) aerospace technology research by establishing a facility to perform testing of entire pressurized airframe structures (e.g., fuselages, wing structures) under combined mechanical (i.e., bending, torsion, shear, and axial) and pressure loads. No facility with such test capabilities exists in the U.S. today. Combined loads testing is vital to the Advanced Composites Technology (ACT) program, for the development of high-speed aircraft such as the advanced supersonic transport (SST) and the high-speed civilian transport (HSCT), and for testing the structural integrity of existing aircraft under the Aging Aircraft Program.

The proposed action is to construct and operate a Combined Loads Test System (COLTS) test facility within the Building 1256 complex at NASA Langley Research Center (LaRC) in Hampton, Virginia. Construction of the proposed COLTS test facility will require making minor modifications to a portion of the existing building to house the control room (the remainder of the building will be unchanged and used to support operations); constructing a new COLTS test chamber; and, constructing new electrical substation and new hydraulic pump room within the Building 1256 complex. The COLTS test chamber will be a 24-meter (80-foot) by 27-meter (90-foot) concrete and metal structure, a portion of which will be located below grade. In order to accommodate the new facility, between 10 and 15 personnel assigned to Building 1256 in the Facility Engineering Division's Micrographics and Engineering Drawings Services will be relocated to available space within two other existing facilities at LaRC.

The proposed action, the No-Action Alternative, and construction of the COLTS test facility at an alternative location at LaRC were considered in this Environmental Assessment (EA). The No-Action Alternative will not provide the needed capability for combined loads testing. The siting alternative will require construction of new infrastructure and all of the COLTS facilities and consequently will have a greater amount of construction activity, and a significantly higher construction cost, than the proposed action.
↳ AND PROBABLY RESULT IN GREATER ADVERSE ENVIRONMENTAL IMPACTS

Based on the evaluations presented in this EA, the potential environmental impacts associated with the proposed construction and operation of a COLTS test facility at LaRC will not individually or cumulatively have a significant effect on the quality of the environment. A Finding of No Significant Impact (FONSI) is recommended.

↓ BE SUBSTANTIAL

2.0 PURPOSE AND NEED

2.1 PROJECT BACKGROUND

The Combined Loads Test System (COLTS) test facility will provide new and unique test capabilities to support aircraft structures development. The COLTS test apparatus will enable the aerospace industry to test pressurized airframe structures (e.g., fuselages, wing structures) under combined mechanical (i.e., bending, torsion, shear, and axial) and pressure loads. The apparatus will accommodate entire aircraft structures up to 4.6 meters (15 feet) in diameter, or segments of larger structures. The apparatus will be used to test the ability of an aircraft structure to meet its service requirements, and will test the damage tolerance of the structure, under realistic loaded conditions.

The proposed COLTS test facility will support three major aerospace technology programs: the Advanced Composites Technology (ACT) program by testing composites for use in supersonic aircraft such as the National Aerospace Plane (NASP); the High Speed Research (HSR) program by testing wing and fuselage structures for the SST and the HSCT; and, the Airframe Structural Integrity Program (ASIP) (i.e., the Aging Aircraft Program) program by testing the integrity of existing aircraft structures.

Facilities capable of performing combined loads testing of large-sized structures do not currently exist in the U.S. The capabilities of the existing structural test facilities are limited to testing shear and torsion loads and these facilities can only test structural components; they cannot accommodate entire structures.

2.2 PROJECT OBJECTIVE

The objective of the proposed action is to construct and operate a COLTS test facility at LaRC which will provide NASA with the capability to perform aircraft structures testing under combined mechanical and pressure loads. This testing capability is needed to support the U.S. aerospace industry in designing and building advanced subsonic and supersonic transport airframe structures. Such testing will provide structure performance information which presently cannot be obtained until after a new structure is placed in service. Obtaining such performance data at an early stage in structure development will reduce the likelihood of costly retrofitting of new structures after they are placed in service. The combined loads testing capability is also needed to support the U.S. aerospace industry in addressing aging aircraft structural issues.

2.3 SCOPE OF THE ENVIRONMENTAL ASSESSMENT

This EA addresses environmental issues related to construction and operation of the proposed COLTS test facility at LaRC. This EA was prepared in accordance with the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act (NEPA) (40 CFR Parts 1500 - 1508) and NASA's regulations implementing the provisions of NEPA (14 CFR Subpart 1216.3, as addressed in NHB 8800.11, Implementing the Provisions of the National Environmental Policy Act, and LHB 8800.1, LaRC Environmental Program Manual).

3.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

3.1 NASA LANGLEY RESEARCH CENTER

NASA LaRC is located in the City of Hampton in southeastern Virginia (Figure 1). LaRC encompasses approximately 327 hectares (807 acres) and consists of numerous facilities providing specialty support to aerospace research and testing.

The Building 1256 complex is located along the eastern perimeter of LaRC immediately adjacent to the Tabbs Creek marsh (Figure 2). Building 1256 was constructed in 1958 and was operated as the 9- by 6- Foot High Pressure Tunnel. The building ceased to be used as a test structure after the high-pressure air manifold failed catastrophically in 1973. The building interior subsequently was modified for office use. Presently Building 1256 is used by the Facilities Program Development Office, Micrographics and Engineering Drawing Services for engineering drawing storage. Between 10 and 15 personnel are assigned to the building.

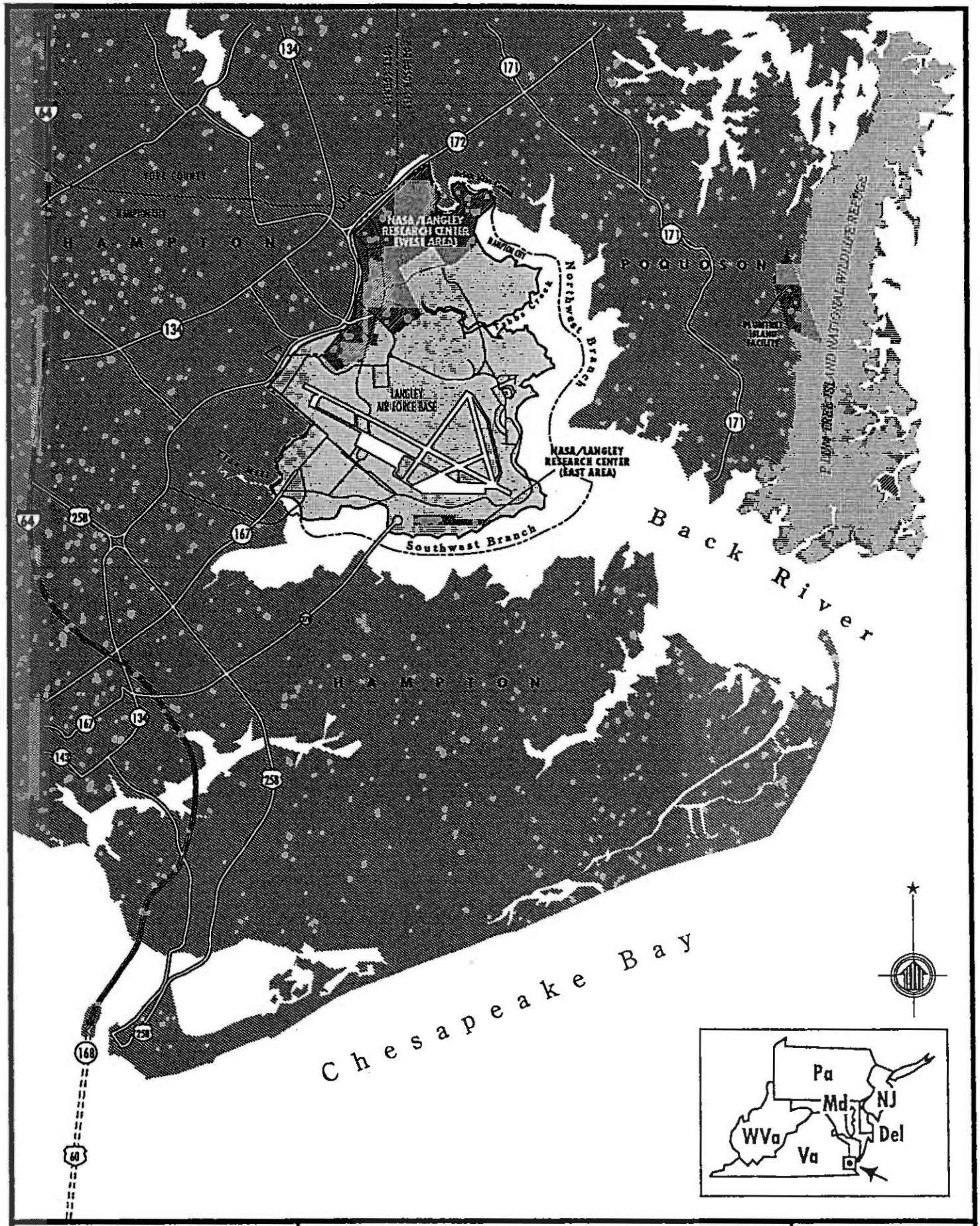
3.2 PROPOSED ACTION

The proposed action calls for constructing and operating a new COLTS test facility within the Building 1256 complex at LaRC (Figure 3). The proposed COLTS test facility will require construction of a new test chamber to house the combined loads test apparatus, rehabilitation and modification of an interior portion of Building 1256 to house the control room, and construction of associated support facilities (i.e., the electrical substation and the hydraulic pump room) exterior to Building 1256.

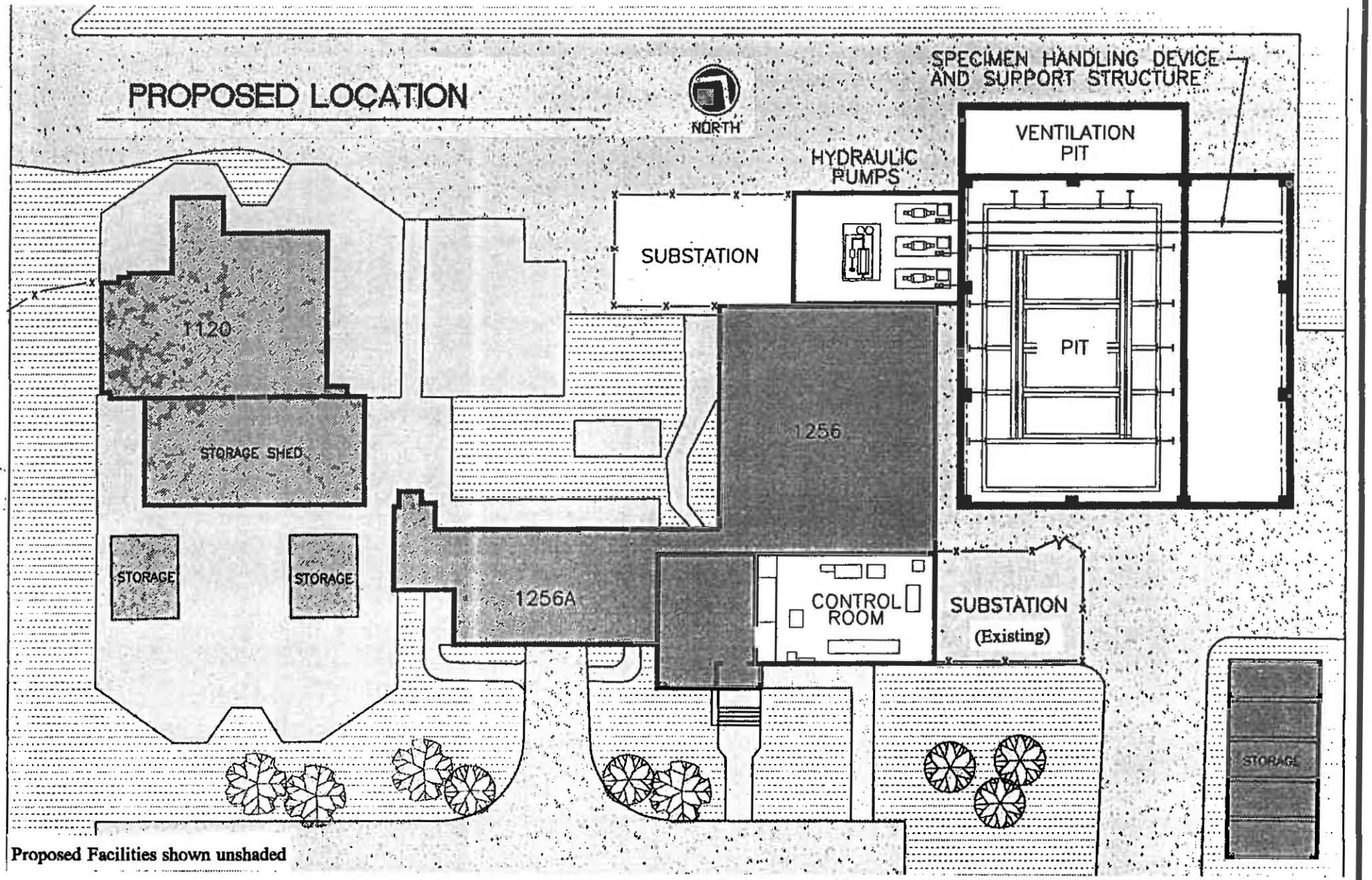
The COLTS test chamber will be constructed adjacent to Building 1256 and will be located entirely within the area of, and replace, an existing concrete pad on the east side of the building. The new COLTS test chamber will be a concrete and steel pressurized enclosure measuring 24 meters (80 feet) by 27 meters (90 feet). The test chamber will include a pit extending 4.5 meters (13 feet) below the ground to encase the test apparatus. A concrete ventilation pit will be located along the north side of the test chamber.

The COLTS control room, which will be located within Building 1256 (see Figure 3), will occupy approximately 93 meters^2 (1,000 feet^2). The proposed COLTS facilities will displace the Micrographics and Engineering Drawing Services personnel from within Building 1256. These personnel will be relocated to available space in existing buildings elsewhere within LaRC: eight persons will be transferred to Building 1232T and the remainder will be transferred to Building 1130T2. Construction of the COLTS control room within Building 1256 will entail minor modification: removal of existing counter facilities and installation of electrical control systems. The remainder of the building will remain as office space and will be used by COLTS test facility operations staff.

Electrical power for the proposed COLTS test facility will be obtained from connection with the existing Building 1221 electrical substation. A new electrical substation will be constructed at the COLTS test facility. The COLTS test apparatus will be operated by three 300-horsepower



EBASCO ENVIRONMENTAL	LOCATION OF NASA LANGLEY RESEARCH CENTER Hampton, Virginia	Figure 1



EBASCO ENVIRONMENTAL

PROPOSED PLAN FOR COLTS TEST FACILITY

Figure 3

hydraulic pumps which will be housed in a new 12-meter (40-foot) by 15-meter (50-foot) hydraulic pump room. Both the new substation and the new hydraulic pump room will be constructed along the north side of Building 1256 in an area which presently has a paved surface and a metal overhang, both of which will be removed.

Heating, cooling, and domestic water service at the proposed COLTS test facility will be provided through connection to the existing utility service lines in the Building 1256 complex. Domestic wastewater will be discharged through connection to the existing sanitary sewer line at Building 1256. Existing stormwater structures at the Building 1256 complex will be unchanged; the roof drains of the new COLTS test chamber and the new hydraulic pump room will be connected to the existing drainage structures. The sump pump in the new test chamber will discharge collected groundwater into the existing LaRC storm drainage system.

→ WILL EXISTING DRAINAGE STRUCTURES BE ADEQUATE TO HANDLE ADDITIONAL FLOW? (ALONE)

Construction of the proposed COLTS test facility is scheduled to begin in the fall of 1994 and the new COLTS test apparatus is scheduled to come on-line in late 1995. The estimated cost of construction is $3.12 million.

The operational schedule of the proposed COLTS test facility will depend upon the demand for testing. It is anticipated that each test program will last for 3 to 6 months, and it is possible that the COLTS test facility may operate for 24 hours a day during a test.

3.3 ALTERNATIVES

The alternatives considered in this EA are the proposed action described in the preceding section, the No-Action Alternative, and construction of the COLTS test facility at an alternative location at LaRC. Construction of the COLTS test facility at a location other than at LaRC is not considered an option because LaRC is NASA's designated lead center for structural research.

~~an~~ FEASIBLE

Inclusion of the No-Action Alternative in an environmental analysis is prescribed by the CEQ Regulations. The No-Action Alternative provides the benchmark against which the proposed action is evaluated. Under the No-Action Alternative there will be no combined loads testing capability in the U.S.

An alternative location was evaluated for the COLTS test facility at LaRC. This location is a grassy field along the west side of Building 1262 (see Figure 2). Construction of the COLTS test facility at this location would require construction of all new facilities to accommodate the test chamber and support functions; utility service would require extensions of existing service lines in the area, AND WOULD PROBABLY RESULT IN GREATER ADVERSE ENVIRONMENTAL IMPACTS.

4.0 ENVIRONMENTAL IMPACTS

4.1 PROPOSED ACTION

4.1.1 Water Quality

IF THIS PLAN INCLUDES A STORMWATER MANAGEMENT CONTROL PLAN IT SHOULD BE STATED. NEED TO SPEAK TO STORMWATER MANAGEMENT CONTROL (MELINE)

AND TO ESTABLISH APPROPRIATE SEDIMENT AND EROSION CONTROL MEASURES

Construction and operation of the proposed COLTS test facility will not impact water quality in the LaRC area. The construction contractor will be required to develop a State-approved sediment and erosion control plan for the project and implement the same during construction to ensure no impact to surface water systems. The area disturbed by construction will not exceed 5 acres, therefore a National Pollutant Discharge Elimination System (NPDES) stormwater construction permit will not be required for project construction.

The proposed COLTS test facility will not be an industrial facility with respect to NPDES regulations. Operations at the test facility will not generate process wastewater, and will not entail handling hazardous or toxic chemicals. Domestic wastewater from the proposed COLTS test facility will be discharged through existing sanitary sewers to the Hampton Roads Sanitation District (HRSD) under the existing LaRC permit for treatment and disposal. There will not be an increase in sanitary wastewater associated with the relocation of 5 personnel who may be working at the COLTS test facility during a test.

Stormwater discharge from the proposed COLTS test facility will be incorporated into the existing stormwater drainage system at the Building 1256 complex; the roof drains of the new COLTS test chamber and the new hydraulic pump room will be connected to the existing LaRC storm drainage lines. There will be no increase in impervious surface at the Building 1256 complex; the new COLTS test facility and hydraulic pump room will be constructed in areas which presently are paved. Groundwater collected by the sump in the COLTS test chamber will discharge to the existing LaRC storm drainage system. NPDES regulations allow sump drains for non-contaminated groundwater in non-industrial facilities to discharge to storm drainage systems. The LaRC NPDES permit application to the Virginia Department of Environmental Quality (DEQ)-Water Division will be modified to include this additional discharge in one of the three existing permitted outfalls adjacent to Building 1256.

4.1.2 Air Quality

Construction of the proposed facility will result in minor and temporary fugitive dust emissions during earthwork operations. During construction LaRC will comply with Virginia Rule 5-1, Fugitive Dust Emissions, by implementing standard construction dust control measures, such as spraying disturbed areas with water, to minimize any dust emissions.

LaRC is located within an ozone non-attainment area and within a state-designated Volatile Organic Compound Emission Control (VOCEC) area. Activities associated with the proposed COLTS test facility do not include any activity which might be classified as an air pollution emission unit under current air pollution regulations. The COLTS test facility will not emit any criteria pollutants or toxic pollutants under normal operation. Space heating will be provided

by the existing LaRC steam system which is supplied by the refuse-fired steam generating facility (RFSGS) in Building 1288 and the oil- and gas- fired boilers in the central heat plant in Building 1215. Both these facilities are permitted by the Virginia DEQ. No capacity addition to the existing steam system will be necessary to meet the requirements of this project. The COLTS test facility will use compressed air as the test medium. A new electrical substation will be constructed to provide electrical power to the test facility. This substation will be supplied through existing Stratton Road substation. No emergency back-up system (e.g., diesel generator) is proposed for the COLTS test facility. Review of DEQ's Stationary Source Permit Exemption Levels (Appendix R, VAR) indicates that no air pollution permit is required for this project based on the Section IV New Source Exemption Levels By Emission Rates. Construction and maintenance activities (e.g., welding, painting) may generate secondary emissions of particulates, volatile organic compounds, and toxic air pollutants. These secondary emissions are expected to be insignificant and are normally not subject to stationary source permitting. Based on the proposed design and operating mode, the construction and operation of the proposed COLTS test facility will not violate any provisions adopted in the Virginia State Implementation Plan (SIP) for maintaining air quality.

4.1.3 Noise

Construction of the proposed COLTS test facility will produce a minor temporary increase in noise levels in the immediate vicinity of the Building 1256 complex. Construction will involve excavation and soil removal, pile driving, and concrete pouring, and will require operation of diesel-powered equipment, such as front-end loaders, dump trucks, mobile cranes, pile drivers, and concrete ready-mix trucks. This equipment will operate intermittently during daytime hours and could produce noise levels as high as 85 to 95 dBA (all construction equipment operating simultaneously) at a 15-meter (50-foot) distance from the construction, with the pile drivers producing a peak impulse noise of 104 dBA at that distance. As part of the LaRC Noise Control and Hearing Conservation Program NASA monitors noise levels within its property and facilities and takes appropriate actions when necessary, such as providing hearing protection or excluding personnel from high noise areas, in compliance with the Federal Noise Control Act (40 CFR Parts 201-211).

The nearest noise-sensitive receptor outside LaRC property is the Langley Gardens Mobile Home Park located about 910 meters (3,000 feet) to the southwest of the proposed COLTS test facility. The construction noise level will decrease by 35 dBA over the 910-meter (3,000-foot) distance to the mobile home park, reducing the construction noise level from a maximum of 85 to 95 dBA in the immediate construction area to a maximum of 50 to 60 dBA at the mobile home park, and the maximum pile driving noise from 104 dBA to 69 dBA at the same locations. These noise levels are equivalent to background traffic noise in the area.

The primary sources of noise during operation of the proposed COLTS test facility are (1) the hydraulic pumps and (2) the pressure release from the test structure when a test specimen fails. Operation of the hydraulic pumps will produce a steady noise which will be maintained below the LaRC noise criterion for occupied areas (85 dBA).

The failure of a specimen during testing will generate a sudden impulse noise due to pressure release from the test facility. No sound level projections are available for this noise source. However, the noise level is not expected to be high, given that the proposed testing will not release a large volume of air under normal operations. The large size of the COLTS test building together with its concrete walls will provide noise attenuation. Further noise attenuation will be provided by the ventilation pit at the COLTS test building which will be configured (i.e., open at the top and located on the far side of the building) to deflect the noise of specimen failure away from occupied areas. Nevertheless, the irregularity and suddenness of the impulse noise may be startling to personnel in the vicinity. Consequently LaRC will monitor the noise level in the immediate area of the proposed COLTS test facility during initial operation of this facility. If the results indicate unacceptable noise conditions additional noise-control measures (e.g., treating the interior of the test structure with an acoustic insulation) will be undertaken.

4.1.4 Potential Site Contamination

A site analysis for LaRC and the Langley Air Force Base, performed by the U.S. Environmental Protection Agency (EPA) (EPA, 1991), indicated that the area directly east of Building 1256 (i.e., the area proposed for construction of the COLTS test chamber) has the potential to be contaminated. This area, designated Site 16 in the EPA analysis, was identified as potentially contaminated due to previous activities such as construction, earth movement, and deposition of unidentifiable fill material, and by operation of the 9- by 6-Foot High Pressure Tunnel (Building 1256).

To address concern over potential discharge of polychlorinated biphenyls (PCBs) from prior operation of the 9- by 6-Foot High Pressure Tunnel limited surface soil sampling was performed in the open area surrounding the existing concrete pad at Building 1256 (Ebasco, 1993). Two of the three samples collected indicated the presence of PCBs at concentrations significantly below the Toxic Substances Control Act (TSCA) soil cleanup level of 10 mg/kg. The third sample had no PCBs present.

To address the potential for contamination from previous fill activities at this location, additional soil sampling was carried out in May 1994 to depths below the proposed foundation level of the COLTS test chamber (Ebasco, 1994). Results of the soil samples indicate the presence of low levels of polynuclear aromatic hydrocarbons (PAHs), PCBs, and pesticides. The concentrations of PAHs were within the range reported for urban soils. Based on known site history, no RCRA listed waste has been disposed of at the site. Since PCB detections are low, the soil will not be classified as a PCB waste.

Inorganic analysis of the samples indicated high concentration of lead (between 10 and 7840 ppm) which may be a result of waste disposal activities. Potential sources of lead contamination include lead paints, lead pipe, soldering waste or lead shots. The high lead concentration in the soil may fail the Toxicity Characteristic Leaching Procedure (TCLP) test and may result in classifying the soil as RCRA characteristic waste. NASA LaRC would perform TCLP test of the soil prior to or after excavation. If the TCLP results were found to be within acceptable limits, some of the excavated soil may be used as backfill in the same location. Excess soil will

be disposed of as solid waste at a permitted off-site disposal area. If the TCLP results exceeded the regulatory limit, NASA LaRC will treat the excavated soil as required under State and Federal regulations. NASA LaRC will specify appropriate procedures for the construction contractor to excavate and dispose of the soil. Therefore, there should be no significant impact to the site or the surrounding areas due to potential contamination. SUBSTANTIAL

4.1.5 Waste Generation, Treatment, Storage, and Disposal

The COLTS test facility construction contractor will be required to identify any hazardous wastes generated by facility construction and to submit a hazardous waste disposal plan to the NASA Contracting Officer for approval prior to the planned disposal. Building 1256 has been surveyed for asbestos; the proposed modifications for the COLTS control room will not entail removal of asbestos. → WAS ASBESTOS FOUND? IF NOT STATE IF YES → STATE THAT ASBESTOS WILL NOT BE DISTURBED/REMOVED.

Excavation for the proposed COLTS test chamber and the substation and hydraulic pump room will be limited to the existing paved areas adjacent to the east and north sides of Building 1256. Excess soil from the excavation will be disposed off-site as stated in Section 4.1.4.

Non-hazardous solid waste generated at LaRC is disposed of by burning in the existing LaRC on-site refuse-to-steam plant, or by disposal in an off-site permitted landfill. Non-hazardous construction debris from the proposed action will be disposed in an off-site permitted landfill; non-hazardous solid waste generated by operation of the COLTS test facility (e.g., spent test specimens) will be incorporated into the existing LaRC solid waste management program. Operation of the proposed COLTS test facility will not generate hazardous waste.

4.1.6 Toxic Substances

Any toxic substances, such as lead paint, encountered during project construction will be managed in accordance with appropriate Federal, state, and local regulations, and with the Langley "Facility Safety Requirements" (LHB 1740.2), the "Langley Safety Requirements" for contractors, Section 01060 (SPECSINTACT), and the "Environmental Program Manual (LHB 8800.1). As stated in Section 4.1.6 the proposed modifications to Building 1256 will not entail asbestos ~~removal~~. THE DISTURBING OR REMOVAL OF ASBESTOS

As stated in Section 4.1.2, operation of the proposed COLTS test facility will not entail the use of solvents or other hazardous materials to prepare or test the specimens.

4.1.7 Radioactive Materials and Non-ionizing Radiation

Construction and operation of the proposed action will not require generation or use of radioactive materials or non-ionizing radiation.

4.1.8 Biological Resources

The proposed COLTS test facility will be located within the densely developed West Area of LaRC. There is no natural habitat within the site proposed for construction of the COLTS facility, although the site is adjacent to the Tabbs Creek marsh. Construction will occur within an area which is presently paved, and there will be no conversion of natural habitat to developed land use. The proposed action will not affect any biological resources.

4.1.9 Endangered and Threatened Species

A comprehensive biological field survey has been initiated at LaRC; preliminary results are anticipated in Fiscal Year (FY) 1995. A review of the Virginia Natural Heritage Program database indicates that no Federal or state-listed endangered or threatened species are known to occur at LaRC (Letter from the Virginia Department of Conservation and Recreation's Division of Natural Heritage dated 21 January 1993 - see Appendix A). The proposed action will occur in an industrial area of LaRC devoid of suitable natural habitat. The proposed action will not affect any listed or proposed endangered or threatened species, or their critical habitat.

4.1.10 Wetlands and Floodplains

LaRC has large areas of tidal marsh wetlands associated with Brick Kiln Creek and Tabbs Creek, and small scattered areas of forested wetlands. No wetlands occur within the site of proposed COLTS test facility although the site is adjacent to the Tabbs Creek marsh. The proposed action does not involve construction within wetlands or a redirection of stormwater in the area; no wetlands will be affected by the proposed action.

The 100-year floodplain elevation at LaRC is at 2.6 meters (8.5 feet) above mean sea level (MSL) and the 500-year floodplain is at 3 meters (9.8 feet) above MSL. The Building 1256 complex is above the 100-year floodplain elevation, but the proposed COLTS test chamber will be within the 500-year floodplain. The proposed COLTS test facility is not considered to be a "critical action facility" under NASA's floodplain regulations (14 CFR Subpart 1216.205). Critical action facilities include such facilities as vital record storage or users of very hazardous materials which could have extremely adverse effects from flooding. NASA's floodplain regulations designate the 500-year flood as the critical flood for these facilities; for all other facilities the regulations designate the 100-year flood as the critical flood.

4.1.11 Coastal Resources Management

The City of Hampton is a tidewater jurisdiction under the Commonwealth of Virginia's approved Coastal Resources Management Program (CRMP). The Virginia CRMP is a networked program, based upon existing state licenses, permits, and approval requirements (Table 4-1). In implementing the CRMP the Virginia DEQ-Division of Public and Intergovernmental Affairs considers an activity to affect the coastal zone if it requires a permit or approval under any of the networked programs; and considers the activity to be consistent with the CRMP if it is consistent with all applicable programs (i.e., receives all applicable state licenses, permits, and

TABLE 4-1
PROGRAMS COMPRISING VIRGINIA'S COASTAL
RESOURCES MANAGEMENT PROGRAM

Program	Administering Agency
Fisheries Management	Marine Resources Commission Department of Game and Inland Fisheries
State p-tert-ButylToluene (TBT) Regulatory Program	Marine Resources Commission Department of Game and Inland Fisheries Department of Agriculture and Consumer Services
Subaqueous Lands Management	Marine Resources Commission
Wetlands Management	Marine Resources Commission
Dunes Management	Marine Resources Commission
Non-point Source Pollution Control	Department of Conservation and Recreation
Point Source Pollution Control NPDES Permit Program Water Quality Certification Under Section 401 of Clean Water Act	Department of Environmental Quality-Water Division
Shoreline Sanitation	Department of Health
Air Pollution Control	Department of Environmental Quality-Air Division

approvals). The only programs applicable to the proposed COLTS test facility are the non-point source pollution control and point source pollution control (the NPDES permit program). As discussed in Section 4.1.1 LaRC will comply with non-point source pollution control program by implementing a sediment and erosion control plan for project construction, and with the NPDES permit program by modifying the existing LaRC NPDES permit application to include the new COLTS test facility. Consequently the proposed action is consistent with the Virginia CRMP.

4.1.12 Historic, Archeological, and Cultural Factors

NASA has a Programmatic Agreement with the National Conference of State Historic Preservation Officers (SHPO) and the Advisory Council on Historic Preservation (ACHP) (signed 20 September 1989) which addresses agency consultation and mitigation on projects which affect (e.g., through demolition, alternation, new construction) facilities designated as National Historic Landmarks (NHLs). A portion of LaRC has been inventoried for buildings which may be considered to be historically significant; inventory of the remainder of the Center is ongoing. Archeological surveys have been performed at various locations throughout LaRC, and a Center-wide Phase I predictive analysis of potential archeological resources is upcoming.

To date six structures at LaRC have been identified as NHLs. LaRC is developing a Cultural Resources Management Plan under the direction of the LaRC Facility Preservation Officer. This Plan will be based upon information obtained from the previous archeological surveys and building inventories within LaRC as well as from the upcoming Center-wide Phase I archeological survey and building inventories. The Plan will specify zones of cultural resources potential and will establish a Historic District within LaRC.

Given the previous filling and construction activity within the Building 1256 complex, archeological resources are not considered to be potentially present at this location. Building 1256, which was constructed in 1958, does not possess historic or architectural significance to be considered a NHL subject to the provisions of the referenced Programmatic Agreement.

4.1.13 Economic, Population, and Employment Factors

LaRC is located in the northern portion of the City of Hampton in the southern Peninsula Area of southeastern Virginia. LaRC is in the central portion of the Hampton Roads Metropolitan Statistical Area (MSA) which consists of the Virginia cities of Chesapeake, Hampton, Newport News, Norfolk, Poquoson, Portsmouth, Suffolk, Virginia Beach, and Williamsburg; the Virginia counties of Gloucester, Isle of Wight, James City, Matthews, and York; and Currituck County, North Carolina.

The population of the City of Hampton was about 135,000 in 1991, while the entire Hampton Roads MSA had a population of 1,431,088. The 1980 population for this area was 1,187,846, which represents a 19.4 percent increase in population in ten years. The Hampton Roads MSA work force consisted of 643,120 civilian and 141,000 active duty military in 1991 (Hampton Roads Planning District Commission, 1993).

LaRC presently employs approximately 3,000 civil service and 2,200 contractors, with an annual payroll of $153 million. LaRC contracts about $ 409 million annually in goods and services both locally and nationally, thus performing an important role in the local economy.

The proposed COLTS test facility will be staffed by 4 to 5 NASA employees, who will be relocated from elsewhere within NASA. This represents less than one tenth of one percent of the existing 5,200 personnel at LaRC, and an insignificant percentage of the Hampton Roads MSA work force. Therefore, no ~~significant~~ impact to the local economy is anticipated from the construction and operation of the COLTS test facility.

4.1.14 Traffic and Parking

Project construction activities will not displace existing parking at the Building 1256 complex; the construction materials and trailers for the proposed COLTS project will be located adjacent to Building 1247 in areas which are presently dedicated to such use. Excavation will occur over a two- to three-week period generating approximately 15 to 20 dump truck round trips each day to transport the soil off-site for disposal. Any transportation of contaminated soil off-site (Section 4.1.4) will be carried out by State permitted contractor in compliance with applicable

regulations. It is anticipated that the concrete delivery will occur during two days, delivered by six truck trips each day. Consequently the COLTS project construction traffic will be for short duration and will not have a significant effect on traffic within LaRC.

Parking for COLTS test facility personnel will be available in the existing Building 1256 parking lot. Operation of the COLTS test facility represents a negligible increase in personnel at the Building 1256 complex on a temporary basis during a test (i.e., up to 5 additional personnel over the present). Operation of the proposed COLTS test facility will not significantly increase traffic flow in the project area. The existing concrete pad behind Building 1256 presently is used by motorists as a shortcut between North Marvin Street and North Wright Street, although it is not a designated thoroughfare within LaRC. Construction of the COLTS test chamber in the pad area will eliminate this shortcut. The relocation of the 15 Micrographics and Engineering Drawing Services personnel from Building 1256 to two other buildings at LaRC will not significantly affect parking or traffic at those locations.

4.1.15 Energy

Sufficient electrical capacity is available from Virginia Power to operate the proposed COLTS test facility. The additional steam requirement for space heating for the proposed COLTS test facility is available from existing steam plants.

4.1.16 Environmental Justice

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires Federal agencies to identify and address the potential for their programs, policies, and actions to have disproportionately high and adverse human health effects or environmental effects on minority populations or low-income populations. The companion Presidential Memorandum, signed February 11, 1994, directs Federal agencies to include in their NEPA documents an analysis of the effects of their actions on minority communities and low-income communities, along with mitigation measures for significant and adverse effects.

As addressed in the previous sections, the proposed action will comply with all applicable environmental statutes and regulations. In so far as the proposed COLTS test facility is not anticipated to have significant environmental or socioeconomic effects, the proposed action will not have disproportionately high or adverse human health effects or environmental effects on minority or low-income populations.

4.2 NO-ACTION ALTERNATIVE

The No-Action Alternative will result in no impacts to the environment relative to existing conditions. However, this alternative will not provide the needed capability for combined loads testing of pressurized structures to support new aircraft technologies, or for testing the structural integrity of existing aircraft.

4.3 ALTERNATIVE CONSTRUCTION SITE AT LaRC

Construction of the COLTS test facility at an alternative site at LaRC will result in the same types of construction and operation impacts as the proposed action. Construction activities will be of a greater magnitude at the alternative site than at the proposed site since the alternative location will require all new construction for the control room and operations area, whereas the proposed action will accommodate the control room and the operations office space within an existing building. Unlike the proposed location which will not change the amount of impervious surface in the area, this alternative will result in a net increase in impervious surface. A ~~financial~~ review of this alternative determined that the construction costs would be significantly (approximately 30 percent) higher for the alternative location than ~~for~~ the proposed location.

↓ AND PROBABLY RESULT IN GREATER ADVERSE ENVIRONMENTAL IMPACTS,

5.0 REFERENCES

Ebasco, December 1993. Draft NPL Facility Management Plan for Langley Research Center, Hampton, Virginia.

Ebasco, June 1994. Soil Sample Results for COLTS Site, Langley Research Center, Hampton, Virginia.

Hampton Roads Planning District Commission, 1993. HRPDC Economic Outlook.

NASA/Langley Research Center. March 1992. Langley Research Center Safety Manual. LHB 1710.5.

NASA/Langley Research Center. November 1991. LaRC Environmental Program Manual. LHB 8800.1.

NASA/Langley Research Center. no date. Construction of Facilities Fiscal Year 1994 Estimates. Construction of Combined Loads Test Systems (COLTS) Facility.

NASA/Langley Research Center. May 1993. Facility Requirements and Advocacy Document for Combined Loads Test System (COLTS). Construction of Facilities FY 1994 Discrete Program.

NASA, April, 1980. Implementing the Provisions of the National Environmental Policy Act. NHB 8800.11.

U.S. Environmental Protection Agency, October 1991. Site Analysis - NASA Langley Research Center/Langley Air Force Base, Hampton, Virginia.

6.0 AGENCIES RECEIVING A COPY OF THE ENVIRONMENTAL ASSESSMENT

Mr. Richard Sanderson
U.S. Environmental Protection Agency
401 M Street, S.W.
Room 2119 M
Washington, DC 20460

Ms. Cindy Schultz
U.S. Department of the Interior, Fish and Wildlife Service
Mid-County Center
U.S. Route 17
P.O. Box 480
Whitemarsh, VA 23183

Ms. Ellie Irons
Department of Environmental Quality
Office of Public and Intergovernmental Affairs
202 N. 9th Street
Richmond, VA 23219

Mr. Raymond T. Fernald
Department of Game and Inland Fisheries
4010 West Broad Street
Richmond, VA 23230

Mr. John R. Davy
Department of Conservation and Recreation
203 Governor Street
Suite 326
Richmond, VA 23219

Mr. Bruce J. Larson
Department of Historic Resources
221 Governor Street
Richmond, VA 23219

Mr. Robert W. Grabb
Assistant Commissioner
Marine Resources Commission
P.O. Box 756
2600 Washington Avenue
Newport News, VA 23607

Ms. Dona Huang
Department of Environmental Quality
Air Division
Ninth Street Office Building, (8th Floor)
Richmond, VA 23219

Mr. Darryl M. Glover
Chesapeake Bay Local Assistance Department
8th Street Office Building, (Room 701)
Richmond, VA 23219

Mr. Leo C. Snead, Jr.
Department of Environmental Quality
Water Division
4900 Cox Road, Innsbrook Corporate Center
Richmond, VA 23230

Mr. Thomas A. Barnard, Jr.
Virginia Institute of Marine Science
Gloucester Point, VA 23062

Dr. Robert B. Stroube
Department of Health
1500 East Main Street
Richmond, VA 23219

Ms. Cathy L. Harris
Department of Environmental Quality
Waste Division
Monroe Building, 11th Floor
101 North 14th Street
Richmond, VA 23219

Mr. Jack E. Frye
Public Beach Board
P.O. Box 1024
Gloucester Point, VA 23062

Mr. Arthur L. Collins
HR PDC
Regional Building
723 Woodlake Drive
Chesapeake, VA 23220

Mr. Robert J. O'Neill
Hampton City Manager
City Hall
22 Lincoln Street
Hampton, VA 23660

APPENDIX A

NATURAL HERITAGE RESOURCES WITHIN LARC REGION

EBASCO

6 June 1994

Timothy J. O'Connell
Environmental Review Coordinator
Virginia Dept. of Conservation and Recreation
Division of Natural Heritage
1500 East Main St., Suite 312
Richmond, Virginia 23219

Re: Resources Management Document for NASA
Langley Research Center, Hampton, Virginia

Dear Mr. O'Connell,

As part of our continuing support of resources management and environmental assessments at of actions at the NASA Langley Research Center (NASA LaRC) in Hampton, Virginia, Ebasco is interested in identifying the natural heritage resources (NHR's) in the local area.

We have attached a copy of your response dated January 1993 received pursuant to our earlier (1993) request for similar information. We would appreciate if you could update the information in the attached listings to include recent additions or deletions to the Federal and State endangered or threatened species.

We look forward to receiving the information at your earliest convenience. Please let us know if there are any charges for services. If you have any questions, please do not hesitate to call me at 703/358 8969.

Sincerely,

Richard G. Taylor
Asst. Environmental Scientist

EBASCO ENVIRONMENTAL *A Division of Ebasco Services Incorporated*
2111 WILSON BOULEVARD, SUITE 435 • ARLINGTON, VA 22201-3058 • (703) 358-8900

ADMINISTRATION
NATURAL HERITAGE
PLANNING AND RECREATION RESOURCES
SOIL AND WATER CONSERVATION
STATE PARKS

COMMONWEALTH of VIRGINIA

DEPARTMENT OF CONSERVATION AND RECREATION

DIVISION OF NATURAL HERITAGE

Main Street Station, 1500 East Main Street — Suite 312

TDD (804) 786-2121 Richmond, Virginia 23219 (804) 786-7951 FAX: (804) 371-2674

21 January 1993

Dottie Keough
Ebasco
2111 Wilson Blvd. Suite 435
Arlington, Virginia 22201

Re: Resources Management Document for NASA Langley Research Center

Dear Ms. Keough:

In response to your request for information, the Department of Conservation and Recreation's Division of Natural Heritage (DNH) has searched its Biological and Conservation Datasystem (BCD) for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources (NHR's) are defined by the Virginia Natural Area Preserves Act as "the habitat of rare, threatened, or endangered plant and animal species, rare or state significant natural communities or geologic sites, and similar features of scientific interest" (sec. 10.1-209 et seq. of the Code of Virginia).

According to the information currently in our files, there are no natural heritage resources documented at the Langley Air Force Base and Langley Research Center. The absence of data does not necessarily mean that natural heritage resources do not exist on or adjacent to the study site, but rather that our files do not currently contain information to document their presence.

To most accurately identify those species with a good potential to occur at the Langley Research Center, I have enclosed lists of natural heritage resources that have been documented on the Poquoson West, Newport News North, and Hampton USGS Quadrangles. All of these resources could occur at Langley in appropriate habitat, however, their presence can only be verified though field surveys. There are no NHR's documented on the Poquoson East Quadrangle.

Due to the delay in responding to your request, I am providing this information to you at no charge. Please note that DNH has recently revised the Information Services provided through

environmental review. An updated fact sheet and order form are included for your reference.

DNH's Biological and Conservation Datasystem is constantly growing and revised. Please contact DNH for an update on this natural heritage information if a significant amount of time passes before it is utilized.

An explanation of species rarity ranks and legal status abbreviations is enclosed for your reference. Thank you for the opportunity to comment on this project.

Sincerely,

Timothy John O'Connell

Timothy J. O'Connell
Environmental Review Coordinator

DEPARTMENT OF CONSERVATION & RECREATION
DIVISION OF NATURAL HERITAGE

NATURAL HERITAGE RESOURCES OF POQUOSON WEST QUAD

SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS
** AMPHIBIANS					
AMBYSTOMA MABEEI	MABEE'S SALAMANDER	G4	S1		LT
AMBYSTOMA TIGRINUM	TIGER SALAMANDER	G5	S1		LE
HYLA GRATIOSA	BARKING TREEFROG	G5	S1		LT
** BIRDS					
ARDEA HERODIAS	GREAT BLUE HERON	G5	S3		
IXOBRYCHUS EXILIS	LEAST BITTERN	G5	S2		
** COMMUNITIES					
COASTAL PLAIN SINKHOLE POND			S1		
ESTUARINE HERBACEOUS VEGETATION					
ESTUARINE SCRUB					
LOW HERBACEOUS WETLAND					
OLIGOTROPHIC SEASONALLY FLOODED WOODLAND					
OLIGOTROPHIC SEMIPERMANENTLY FLOODED WOODLAND					
SUBMESOTROPHIC FOREST					
** MAMMALS					
CONDYLURA CRISTATA PARVA	STAR-NOSED MOLE	G5T4	S2	3C	
** NON-VASCULAR PLANTS					
SPHAGNUM MACROPHYLLUM VAR MACROPHYLLUM	LARGE-LEAF PEATMOSS	G3G4T3	S2		
** VASCULAR PLANTS					
BOLTONIA CAROLINIANA	CAROLINA BOLTONIA	G2Q	S2		
CAREX COLLINSII	COLLINS' SEDGE	G4	S3		
CUSCUTA INDECORA	PRETTY DODDER	G5	S2?		
ELEOCHARIS TENUIS VAR VERRUCOSA	SLENDER SPIKERUSH	G5T3T5	S1		
FIMBRISTYLIS PERPUSILLA	HARPER'S FIMBRISTYLIS	G2	S1	C2	LE
LYTHRUM ALATUM VAR ALATUM	WINGED LOOSESTRIFE	G5T5	S2		
SABATIA CAMPANULATA	SLENDER MARSH PINK	G5	S2		
TILLANDSIA USNEOIDES	SPANISH MOSS	G5	S2		

22 Records Processed

DEPARTMENT OF CONSERVATION & RECREATION
DIVISION OF NATURAL HERITAGE

NATURAL HERITAGE RESOURCES OF NEWPORT NEWS NORTH QUAD

SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS
** AMPHIBIANS					
AMBYSTOMA MABEEI	MABEE'S SALAMANDER	G4	S1		LT
** VASCULAR PLANTS					
CAREX LUPULIFORMIS	FALSE HOP SEDGE	G3G4Q	S1		
CYPERUS DIANDRUS	UMBRELLA FLATSEDGE	G5	SH		
QUERCUS SHUMARDII	SHUMARD'S OAK	G5	S2		
TRILLIUM PUSILLUM VAR VIRGINIANUM	VIRGINIA LEAST TRILLIUM	G3T2	S2	C2	

5 Records Processed

DEPARTMENT OF CONSERVATION & RECREATION
DIVISION OF NATURAL HERITAGE

NATURAL HERITAGE RESOURCES OF HAMPTON QUAD

SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS
** BIRDS					
CASMERODIUS ALBUS	GREAT EGRET	G5	SB2SN4		
CHARADRIUS MELODUS	PIPING PLOVER	G3	S2	LT	LT
RYNCHOPS NIGER	BLACK SKIMMER	G5	S2		
STERNA ANTILLARUM	LEAST TERN	G4	S2		
STERNA HIRUNDO	COMMON TERN	G5	S3		
** INVERTEBRATES					
CICINDELA DORSALIS DORSALIS	NORTHEASTERN BEACH TIGER BEETLE	G4T2	S2	LT	C
** OTHER					
CHAMPION TREE					
** VASCULAR PLANTS					
CAREX PEDUNCULATA	LONGSTALK SEDGE	G5	S2		
CUSCUTA INDECORA	PRETTY DODDER	G5	S2?		
DESMODIUM STRICTUM	PINELAND TICK-TREFOIL	G3G4	S2		
DESMODIUM TENUIFOLIUM	SLIM-LEAF TICK-TREFOIL	G3G4	S2		
DROSERA BREVIFOLIA	DWARF SUNDEW	G5	S2		
IVA IMBRICATA	SEA-COAST MARSH-ELDER	G5?	S1S2		

17 Records Processed

Definition of Abbreviations Used on Natural Heritage Resource Lists
of the
Virginia Department of Conservation and Recreation

Natural Heritage Ranks

The following ranks are used by the Virginia Department of Conservation and Recreation to set protection priorities for natural heritage resources. Natural Heritage Resources, or "NHR's," are rare plant and animal species, rare and exemplary natural communities, and significant geologic features. The primary criterion for ranking NHR's is the number of populations or occurrences, i.e. the number of known distinct localities. Also of great importance is the number of individuals in existence at each locality or, if a highly mobile organism (e.g., sea turtles, many birds, and butterflies), the total number of individuals. Other considerations may include the quality of the occurrences, the number of protected occurrences, and threats. However, the emphasis remains on the number of populations or occurrences such that ranks will be an index of known biological rarity.

S1 Extremely rare; usually 5 or fewer populations or occurrences in the state; or may be a few remaining individuals; often especially vulnerable to extirpation.

S2 Very rare; usually between 5 and 20 populations or occurrences; or with many individuals in fewer occurrences; often susceptible to becoming extirpated.

S3 Rare to uncommon; usually between 20 and 100 populations or occurrences; may have fewer occurrences, but with a large number of individuals in some populations; may be susceptible to large-scale disturbances.

S4 Common; usually >100 populations or occurrences, but may be fewer with many large populations; may be restricted to only a portion of the state; usually not susceptible to immediate threats.

S5 Very common; demonstrably secure under present conditions.

SA Accidental in the state.

SB# Breeding status of an organism within the state.

SH Historically known from the state, but not verified for an extended period, usually > 15 years; this rank is used primarily when inventory has been attempted recently.

SN# Non-breeding status within the state. Usually applied to winter resident species.

SR Reported without persuasive documentation

SU Status uncertain, often because of low search effort or cryptic nature of the element.

SX Apparently extirpated from the state.

SZ Long distance migrant whose occurrences during migration are too irregular, transitory and/or dispersed to be reliably identified, mapped and protected.

Global ranks are similar, but refer to a species' rarity throughout its total range. Global ranks are denoted with a "G" followed by a character. Note that GA and GN are not used and GX means apparently extinct. A "Q" in a rank indicates that a taxonomic question concerning that species exists. Ranks for subspecies are denoted with a "T". The global and state ranks combined (e.g. G2/S1) give an instant grasp of a species' known rarity.

These ranks should not be interpreted as legal designations.

Federal Legal Status

The Division of Natural Heritage uses the standard abbreviations for Federal endangerment developed by the U.S. Fish and Wildlife Service, Division of Endangered Species and Habitat Conservation.

LE - Listed Endangered
LT - Listed Threatened
PE - Proposed Endangered
PT - Proposed Threatened
C1 - Candidate, category 1
C2 - Candidate, category 2

3A - Former candidate - presumed extinct
3B - Former candidate - not a valid species under current taxonomic understanding
3C - Former candidate - common or well protected
NF - no federal legal status

State Legal Status

The Division of Natural Heritage uses similar abbreviations for State endangerment.

LE - Listed Endangered
LT - Listed Threatened
C - Candidate

PE - Proposed Endangered
PT - Proposed Threatened
NS - no state legal status

For information on the laws pertaining to threatened or endangered species, contact:

U.S. Fish and Wildlife Service for all FEDERALLY listed species
Virginia Department of Agriculture and Consumer Services Plant Protection Bureau for STATE listed plants and insects;
Virginia Department of Game and Inland Fisheries for all other STATE listed animals.

5/92