



**NATIONAL AERONAUTICS AND
SPACE ADMINISTRATION**

**NASA SHARED SERVICES CENTER (NSSC)
PHASE 2 ENVIRONMENTAL ASSESSMENT**

Lead Agency: National Aeronautics and Space Administration

Proposed Action: To consolidate selected administrative functions currently carried out at NASA Centers into a new Center known as the NASA Shared Services Center (NSSC)

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EXECUTIVE SUMMARY

BACKGROUND

The National Aeronautics and Space Administration (NASA) is proposing to consolidate certain transactional functions currently performed across NASA Centers to a new business unit known as the NASA Shared Services Center (NSSC).¹ The NSSC would provide NASA with a wide array of benefits, ranging from enhanced services at lower costs and improved timeliness, accuracy and consistency of information to the strategic management of NASA resources and improved performance efficiencies. NASA, in the *NASA Shared Services Center (NSSC) Implementation Plan Report* (NSSC-RPT-02 Volume 1, September 2003) (*Implementation Plan*), recommended continued planning for early implementation of an NSSC.

NASA is required to analyze the environmental consequences of the proposed action, its alternatives, including the No Action alternative, and any potential mitigation, under the National Environmental Policy Act (NEPA) (Title 42, United States Code (U.S.C.) 4321-4370d), Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act (Title 40, Code of Federal Regulations (CFR) parts 1500-1508), and NASA NEPA Implementing Procedures (Title 14, CFR subparts 1216.1 and 1216.3), the National Historic Preservation Act, as amended (16 U.S.C. 470 *et seq.*), NASA regulations (14 CFR subpart 1216.2) for implementing Executive Order (E.O.) 11988, Floodplain Management, May 24, 1977 (42 Fed. Reg. 26951), and E.O. 11990, Protection of Wetlands, May 24, 1977 (42 Fed. Reg. 26961), and the NASA Environmental Justice Strategy (1994) for implementing E.O. 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, Feb. 11, 1994 (59 Fed. Reg. 7269, Feb. 16, 1994).

Under NASA's NEPA implementing procedures, the administrative reorganization and facility selection for the proposed NSSC may qualify as a categorical exclusion (14 CFR 1216.305(d)(7) or (8)), i.e., these actions may not require more detailed environmental analysis after review of any unique or extraordinary circumstances, public controversy on environmental grounds, and risks to public health and safety. However, the proposed action may, depending on the circumstances, lead to proposals normally requiring more detailed environmental analysis. NASA has therefore initiated a phased environmental evaluation process, beginning with a Phase 1 Environmental Assessment (EA), in accordance with §102(2)(E) of NEPA and NASA implementing procedures. The Phase 1 EA, which was completed January 15, 2003, was used internally for early planning purposes and in establishing guidelines for NASA Centers to use in nominating one potential site per Center with minimal environmental impacts under the proposed action.² All nominations included a NASA Environmental Checklist and draft Record of Environmental Consideration (REC). The Phase 1 EA, NASA Environmental Checklists, and draft RECs are incorporated by reference in the site-specific EA Phase 2.

¹ <http://nssc.nasa.gov/background.html>

² http://www.hq.nasa.gov/office/codej/codeje/je_site/nepa/about_nepa.html

NASA has prepared this Phase 2 EA in accordance with the above regulatory requirements and to comply with NASA Procedural Requirements (NPR) 8580.1, Implementing the National Environmental Policy Act and Executive Order 12114, and NASA Policy Directive (NPD) 8500.1A, NASA Environmental Management, which require NASA to consider environmental factors throughout the lifecycle of an environmental management program, including planning, development, and operations.

ALTERNATIVE A (PROPOSED ACTION AND PREFERRED ALTERNATIVE)

The Proposed Action (and Preferred Alternative) (Alternative A) would be to consolidate and co-locate certain currently dispersed transactional and administrative activities performed across NASA Centers in human resources, procurement, financial management, and information technology (IT) identified in the *Implementation Plan*. Other types of functional activities or services may be consolidated into the NSSC in the future.

The NSSC would become operational on or about October 2005 and employ approximately 500 civil service personnel and contractors after full transition over five years. The NSSC may expand by 40 percent over the long-term. Most personnel currently carrying out such functions at existing Centers would remain at their respective locations to concentrate on mission responsibilities. Some personnel would leave due to normal attrition and some would be relocated to the NSSC. In addition to labor cost and availability, siting criteria included workforce diversity, local transportation access, access by other NASA Centers, safe and healthful working conditions, opportunities for further employee development in the vicinity of the proposed NSSC, and opportunities for partnering with local education institutions, including minority institutions.

The NSSC would require Class A office space in a facility comparable to a mid-size office building of approximately 12,150 square meters (m²) (135,000 square feet (ft²)) with associated infrastructure, parking, and temporary swing space. No computer "data centers" are planned. The IT functions consolidated to NASA Marshall Space Flight Center would remain at NASA Marshall Space Flight Center but be consolidated organizationally into the NSSC. NASA would construct or lease the facility in partnership with State or local agencies or commercial partners. In addition to facility size, NASA siting criteria included sustainable design consistent with NASA's sustainable design policy for new and renovated facilities (NPD 8820.3, Facility Sustainable Design, NASA 2003, and NASA Memorandum on Policy for LEED® Leadership in Energy and Environmental Design Ratings for NASA New Facilities Projects, NASA Facilities Engineering Division, September 5, 2003). NASA also committed to designating a part- or full-time NASA NSSC Environmental Manager and NASA NSSC Energy Manager, and developing or applying an Environmental Management System (EMS) (NPR 8553.1, NASA Environmental Management System, developed in response to E.O. 13148, Greening the Government Through Environmental Leadership), and would also develop an Environmental Justice Strategy for the NSSC in response to NASA's Environmental Justice Strategy and E.O. 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations.

Additional siting criteria in the nomination guidelines included location of the NSSC in accordance with the priorities and procedures established in the Rural Development Act (RDA)

of 1972, as amended, §601 (7 U.S.C. 2204b-1) (requiring Federal agencies to implement policies and procedures for giving first priority to rural areas); E.O. 12072, Federal Space Management, dated August 16, 1978 (requiring Federal agencies to locate facilities according to listed criteria); E.O. 13006, Locating Federal Facilities on Historic Properties in Our Nation's Central Cities, dated May 21, 1996 (directing Federal agencies to give priority to locating in historic properties and districts); other applicable Federal, State, Tribal, and local requirements; and the ability of local communities to provide adequate housing, schools, health care, recreational opportunities, and other amenities.

To demonstrate efficiencies not only in functional performance, but also in facility management supporting the NSSC, and to meet the timetable for implementing the NSSC, NASA's siting criteria included the ability to mitigate environmental impacts in the design and operation of the NSSC to below applicable significance levels.

NASA invited each NASA Center to nominate one proposed site using NASA siting criteria. The sites could be located on a NASA Center or off Center and use existing facilities or propose new construction.

ALTERNATIVE B (VIRTUAL CONSOLIDATION)

Under Alternative B, NASA would consolidate the functions into an NSSC in a virtual environment. Under this alternative, NASA would reorganize and relocate some personnel and equipment among existing Centers and make minor upgrades or modifications to facilities and equipment at existing Centers.

ALTERNATIVE C (NO ACTION ALTERNATIVE)

Under the No Action alternative (Alternative C), NASA would not consolidate functions into an NSSC, but may continue to reorganize and relocate personnel and equipment and make minor upgrades or modifications to facilities and equipment in its on-going effort to improve administrative performance.

SUMMARY OF ALTERNATIVES

The numbering of the following NSSC alternatives corresponds to the numbering used for the alternatives described in the Phase 1 EA. Since no sites using existing facilities, either on an existing NASA Center (Alternative A.1) or outside of an existing NASA Center (Alternative A.3), were nominated, Alternatives A.1 and A.3 were not carried forward for further analysis in the Phase 2 EA. All of the proposed sites that are discussed under Alternative A in this Phase 2 EA would involve new construction and include infrastructure, parking, and temporary swing space. Nominations under Alternative A.2 would locate the NSSC in a new building at an existing NASA Center. Nominations under Alternative A.4 would locate the NSSC in a new building at a location outside of an existing NASA Center. NASA, as part of the service provider procurement process, allowed proposers to integrate any of the six sites into their proposals. NASA announced on January 7, 2005, that three of the six sites were incorporated by prospective service providers and retained by NASA for consideration as the decisionmaking process proceeds. The retained sites under Alternative A are A.2.2 (NASA

Stennis Space Center), A.4.1 (Aerospace Technology Park), and A.4.4 (Cummings Research Park). Alternatives considered in this Phase 2 EA are listed below. Alternatives that will be carried forward for further consideration in the decisionmaking process are highlighted in bold type.

- *Alternative A: Consolidation and co-location of functions at an NSSC at one of the following locations:*
 - **New construction at an existing NASA Center (Alternative A.2 in Phase 1 EA):**
 - A.2.1 NASA Johnson Space Center (JSC), Clear Lake, Texas.
 - **A.2.2 NASA Stennis Space Center (SSC), Hancock County, Mississippi.**
 - **New construction outside of an existing NASA Center (Alternative A.4 in Phase 1 EA):**
 - **A.4.1 Aerospace Technology Park, City of Brook Park, Ohio, nominated by the Glenn Research Center (GRC).**
 - A.4.2 Central Florida Research Park (CFRP), Orlando, Florida nominated by the Kennedy Space Center (KSC).
 - A.4.3 City Center at Oyster Point, Newport News Virginia, nominated by the Langley Research Center (LaRC).
 - **A.4.4 Cummings Research Park (CRP), Huntsville, Alabama, nominated by the Marshall Space Flight Center (MSFC).**
- *Alternative B: Consolidation of functions into a virtual NSSC*
- *Alternative C: No consolidation of functions into an NSSC (No Action alternative)*

FINDINGS

On the basis of the EA Phase 2, NASA has determined that it is reasonably foreseeable that the environmental impacts associated with any of the three alternatives are negligible or can be easily prevented and mitigated.

Alternative A (Proposed Action and Preferred Alternative)

Issues commonly associated with construction or modification and operation of a mid-size office building include air emissions from site clearing and construction; noise during construction and operation; impacts to cultural resources, stormwater drainage, wetlands, floodplains, and wildlife

due to site clearing, excavation, and increased traffic and other human activity; aesthetic or other impacts to historic properties; and changes in local traffic patterns and levels.

All nominations were required to include a completed NASA Environmental Checklist and draft Record of Environmental Consideration (REC). For all new construction alternatives at existing Centers, NASA reviewed environmental baseline information and other relevant information. For those alternatives requiring construction of new facilities off-Center, NASA reviewed information from Federal, State, and local planning and environmental agencies and other relevant sources. Table EX-1 summarizes the key findings and indicates the planned mitigation. The findings presented here are limited to the three sites under Alternative A that are being carried forward in the decisionmaking process.

None of the alternatives (Alternatives A, B, and C) would affect floodplains or the coastal zone. Under Alternative A, development of the NSSC at the Aerospace Technology Park site require a § 404 Clean Water Act wetlands permit, which is anticipated to result in wetlands mitigation off site comparable to mitigation required for the expansion of the adjacent Cleveland-Hopkins International Airport, but on a much smaller scale. All sites would comply with stormwater management plans and permits.

No Federally listed threatened or endangered species or critical habitat or Federally protected species would be affected under any Alternative. NASA would require, as a condition of a lease or contract, pre-construction surveys for migratory birds and the Indian bat at the Aerospace Technology Park site. If the presence of these species is indicated, NASA would consult with the U.S. Fish and Wildlife Service. Mitigation may include adjusting the construction schedule. At any of the sites, if threatened or endangered species or other protected species are discovered during construction, NASA would consult with the U.S. Fish and Wildlife Service in accordance with applicable statutes and regulations.

Traffic and associated air quality impacts are expected to be minimal due to site locations near major arterials and the availability of traffic management options. NASA would require that precautions be taken to minimize dust and noise impacts at all sites.

Level/Phase 1 Site Assessments for contamination were completed at the Cummings Research Park site and an extensive Center-wide survey was conducted at NASA Stennis Space Center. None of these assessments indicated that contamination was likely or that a Level 2 Site Assessment would be needed. Based on current information available to NASA, contamination is also not anticipated at the Aerospace Technology Park site, but NASA as a condition of a lease or contract, require completion of a confirmatory Level 1 Site Assessment and if contamination requiring remediation is discovered at a site as a result of the Level 1 Site Assessment or during construction, development and implementation of a remediation plan.

Cultural resources surveys have been completed for the Cummings Research Park site and NASA Stennis Space Center and the proposed action would not affect cultural resources at or in the vicinity of those sites. Based on current information available for the Aerospace Technology Park site and surrounding areas, no historic structures would be affected and NASA does not anticipate the presence of major archeological resources, but as a condition of a lease or contract

would require confirmatory test borings for archeological resources as recommended by the Ohio State Historic Preservation Office. If archaeological resources are discovered at a site prior to construction, NASA would consult with the Ohio State Historic Preservation Office. A mitigation plan may be required. As a condition of a contract or lease, NASA would require that if unanticipated discovery occurs during construction at any of the three sites, construction would cease and NASA would consult with the respective State Historic Preservation Officer and mitigation may be required. A mitigation plan may include adjusting the footprint, phasing construction, recovering data, curating artifacts, and providing the public with information about the site's history.

The Proposed Action would not result in disproportionately high and adverse environmental impacts on minority or low-income populations or affect children's environmental health or safety at any of the proposed sites. NASA would develop an environmental justice strategy for the NSSC or apply the strategy of the host or nearby NASA Center.

NASA would also develop an NSSC-specific EMS or apply the EMS of the host or nearby NASA Center.

Thus, the location and operation of the NSSC at any of the three sites (NASA Stennis Space Center, Aerospace Technology Park, and Cummings Research Park) proposed for further consideration in the decisionmaking process as of NASA's January 7, 2005 announcement would meet the purpose and need of the NSSC and would not result in substantial direct, indirect, or cumulative environmental impacts.

Alternative B (Virtual Consolidation)

Under Alternative B, NASA would consolidate functions in a virtual environment without co-locating employees and contractors to a new location. NASA would relocate some personnel and equipment among existing Centers and require minor upgrades in facilities and equipment at existing Centers. NASA would continue to implement Center EMSs to avoid or reduce adverse environmental impacts during operations. Virtual consolidation, however, is unlikely to result in substantial direct, indirect, or cumulative environmental impacts not covered under existing Center permits and environmental reviews. In specific instances, and depending upon the circumstances, minor modifications of a facility at a Center could result in additional environmental review and permitting. Alternative B would not fully meet the purpose and need for the NSSC.

Alternative C (No Action Alternative)

Under the No Action Alternative, NASA would not create an NSSC but would continue to relocate personnel and equipment among existing Centers and make minor upgrades in facilities and equipment at existing Centers as part of its on-going effort to improve efficiency and performance of its administrative operations. Such efforts, however, are unlikely to result in substantial direct, indirect, or cumulative environmental impacts not covered under existing Center permits and environmental reviews. In specific instances, and depending upon the circumstances, minor modifications of a facility at a Center could result in additional

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environmental review and permitting. NASA would continue to implement Center EMSs to avoid or reduce adverse environmental impacts during on-going operations. Alternative C would not meet the purpose and need for the NSSC.

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Table EX-1. Summary of Potential Environmental Impacts of Alternatives A, B, and C (mitigation indicated in footnotes)

Resource ³	Alternative A: Consolidation						Alternative B: Virtual Consolidation	Alternative C: No Action
	A.2.1 NASA Johnson Space Center	A.2.2 NASA Stennis Space Center	A.4.1 Aerospace Technology Park (by GRC)	A.4.2 Central Florida Research Park (CFRP) by KSC)	A.4.3 City Center at Oyster Point (by LaRC)	A.4.4 Cummings Research Park (CRP) (by MSFC)		
NSSC Location	Clear Lake, TX	Hancock County, MS	Brook Park, OH	Orlando, FL	Newport News, VA	Huntsville, AL		
Construction Required ⁴	Yes, on-site	Yes, on-site	Yes, off-site	Yes, off-site	Yes, off-site	Yes, off-site	No	No
Transportation and Traffic	Low impact	Low impact	Low impact	Low impact	Low impact	Low impact	No impact	No impact

³ Alternative A: NASA NSSC Environmental Management System to be developed or EMS of host or nearby NASA Center would apply, and full- or part-time NASA NSSC Environmental Manager would be designated. Alternatives B and C: Current NASA Center EMS would apply.

⁴ Alternative A: All nominations required consistency with NASA's sustainable facilities policy.

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Resource ³	Alternative A: Consolidation						Alternative B: Virtual Consolidation	Alternative C: No Action
	A.2.1 NASA Johnson Space Center	A.2.2 NASA Stennis Space Center	A.4.1 Aerospace Technology Park (by GRC)	A.4.2 Central Florida Research Park (CFRP) by KSC)	A.4.3 City Center at Oyster Point (by LaRC)	A.4.4 Cummings Research Park (CRP) (by MSFC)		
Solid and Hazardous Waste	Low to no impact ⁵	Low to no impact ⁶	Low to no impact ⁷	Low to no impact ⁸	Low to no impact ⁹	Low to no impact ¹⁰	No impact	No impact
Public Services and Utilities ¹¹	Low to no impact	Low to no impact	Low to no impact	Low to no impact	Low to no impact.	Low to no impact	Low to no impact	No impact

⁵ No Level/Phase 1 Site Assessment. Available information does not indicate contamination likely. Confirmatory Environmental Site Assessment for contamination would be required as a condition of a lease or contract.

⁶ Center-wide survey completed. No contamination indicated at the proposed site. State of Mississippi concurred.

⁷ No Level/Phase 1 Site Assessment. Available information does not indicate contamination likely. Confirmatory Environmental Site Assessment for contamination required as a condition of a lease or contract.

⁸ No Level/Phase 1 Site Assessment. Available information does not indicate contamination likely. Confirmatory Environmental Site Assessment for contamination required as a condition of a lease or contract.

⁹ Level/Phase 1 Site Assessment completed. Level 2 Site Assessment not indicated.

¹⁰ Level 1 Site Assessment completed. Level 2 Site Assessment not indicated.

¹¹ Alternative A: NASA NSSC Energy Manager, full- or part-time, to be designated. Alternatives B and C: Current on-site NASA Center Energy Manager.

Phase 2 Environmental Assessment – NASA Shared Services Center

Resource ³	Alternative A: Consolidation						Alternative B: Virtual Consolidation	Alternative C: No Action
	A.2.1 NASA Johnson Space Center	A.2.2 NASA Stennis Space Center	A.4.1 Aerospace Technology Park (by GRC)	A.4.2 Central Florida Research Park (CFRP) by KSC)	A.4.3 City Center at Oyster Point (by LaRC)	A.4.4 Cummings Research Park (CRP) (by MSFC)		
Communication	Low to no impact	Low to no impact	Low to no impact	Low to no impact	Low to no impact	Low to no impact	Low to no impact	No impact
Land Use	Low impact	Low impact	Low impact	Low impact	Low impact	Low impact	No impact	No impact
Noise	Low impact	Low impact	Low impact ¹²	Low impact	Low impact	Low impact	No impact	No impact
Air Quality	Low to no impact ¹³	Low to no impact	Low to no impact	Low to no impact	Low to no impact	Low to no impact	No impact	No impact
Water Resources	Low to no impact	Low to no impact	Low to no impact	Low to no impact ¹⁴	Low to no impact	Low to no impact ¹⁵	No impact	No impact

¹² Noise impacts from adjoining airport to be mitigated in accordance with occupational health and safety regulations and local noise codes.

¹³ Confirmatory Clean Air Act General Conformity Determination (NOx and VOCs) may be required; construction scheduling adjustment and other mitigation may be required if relevant emissions exceed *de minimus* levels. Preliminary analysis indicated that levels would be well below *de minimus* levels.

Phase 2 Environmental Assessment – NASA Shared Services Center

Resource ³	Alternative A: Consolidation						Alternative B: Virtual Consolidation	Alternative C: No Action
	A.2.1 NASA Johnson Space Center	A.2.2 NASA Stennis Space Center	A.4.1 Aerospace Technology Park (by GRC)	A.4.2 Central Florida Research Park (CFRP) by KSC)	A.4.3 City Center at Oyster Point (by LaRC)	A.4.4 Cummings Research Park (CRP) (by MSFC)		
Soils and Geology	Low to no impact	Low to no impact	Low to no impact	Low to no impact	Low to no impact	Low to no impact	No impact	No impact
Biological Resources ¹⁶	Low to no impact ¹⁷	Low to no impact	Low to no impact ¹⁸	Low to no impact	No impact	No impact	No impact	No impact
Ecological Resources	No impact	No impact	Wetlands impact to be mitigated ¹⁹	No impact	No impact	No impact	No impact	No impact

¹⁴ State Environmental Resources Permit required.

¹⁵ State approved stormwater management plan required.

¹⁶ All: If protected species are subsequently discovered on site or species on site are later designated for protection, NASA would consult with the U.S. Fish and Wildlife Service.

¹⁷ Pre-construction survey would be required for migratory birds as a condition of a lease or contract, and if results indicate presence, adjustment of construction schedule may be required.

¹⁸ Pre-construction survey would be required for migratory birds and Indiana bat as a condition of a lease or contract, and if results indicate presence, adjustment of construction schedule may be required.

Phase 2 Environmental Assessment – NASA Shared Services Center

Resource ³	Alternative A: Consolidation						Alternative B: Virtual Consolidation	Alternative C: No Action
	A.2.1 NASA Johnson Space Center	A.2.2 NASA Stennis Space Center	A.4.1 Aerospace Technology Park (by GRC)	A.4.2 Central Florida Research Park (CFRP) by KSC)	A.4.3 City Center at Oyster Point (by LaRC)	A.4.4 Cummings Research Park (CRP) (by MSFC)		
Cultural and Historic Resources ²⁰	Low to no impact ²¹	No impact	Low to no impact ²²	Low to no impact ²³	Low to no impact ²⁴	No impact	No impact	No impact

¹⁹ Clean Water Act § 404 wetlands permit from the Army Corps of Engineers required; wetlands mitigation planned off-site.

²⁰ Alternative A: NASA would require as a condition of a lease or contract that if unanticipated discovery occurs during excavation or construction, construction would cease, and NASA would consult with respective SHPO. Mitigation may be required and may include adjustment of the footprint or construction schedule, data recovery, curation, and public education display.

²¹ No impact to National Historic Landmarks at JSC. Confirmatory site testing for archeological resources may be required, and if results indicate presence, NASA would consult with SHPO. Mitigation plan may be required which may include adjustment of the footprint or construction schedule, data recovery, curation, and public education display.

²² Site testing for archeological resources would be required as recommended by the Ohio Historic Preservation Office, and if results indicate presence, NASA would consult with the Ohio SHPO. Mitigation plan may be required which may include adjustment of the footprint or construction schedule, data recovery, curation, and public education display.

²³ Confirmatory site testing for archeological resources may be required, and if results indicate presence, NASA would consult with SHPO. Mitigation plan may be required which may include adjustment of the footprint or construction schedule, data recovery, curation, and public education display.

²⁴ Confirmatory site testing for archeological resources may be required, and if results indicate presence, NASA would consult with SHPO. Mitigation plan, if needed, may include adjustment of the footprint or construction schedule, data recovery, curation, and public education display.

Phase 2 Environmental Assessment – NASA Shared Services Center

Resource ³	Alternative A: Consolidation						Alternative B: Virtual Consolidation	Alternative C: No Action
	A.2.1 NASA Johnson Space Center	A.2.2 NASA Stennis Space Center	A.4.1 Aerospace Technology Park (by GRC)	A.4.2 Central Florida Research Park (CFRP) by KSC)	A.4.3 City Center at Oyster Point (by LaRC)	A.4.4 Cummings Research Park (CRP) (by MSFC)		
Environmental Justice ²⁵	No adverse impact	No impact	No impact	No impact	No impact	No impact	No impact	No impact

²⁵ Alternative A: NASA NSSC EJ Strategy would be developed or host or nearby NASA Center EJ Strategy would apply. Alternatives B and C: Current NASA Center EJ Strategy would apply.

ACRONYMS

ACAM	Air Conformity Applicability Model
ADA	Americans with Disabilities Act
APCD	Air Pollution Control District
AQMD	Air Quality Management District
AST	Aboveground Storage Tank
ASTM	American Society for Testing and Materials
BAHEP	Bay Area Houston Economic Partnership
BMP	Best Management Practice
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CFRP	Central Florida Research Park
CRP	Cummings Research Park
dB	Decibel Units
dBA	A-weighted decibel units
DRI	Development of Regional Impact
DOC	Department of Commerce
EA	Environmental Assessment
EJ	Environmental Justice
EIS	Environmental Impact Statement
EMO	Environmental Management Office
EMS	Environmental Management System
EO	Executive Order
EPA	United States Environmental Protection Agency
FEIS	Final Environmental Impact Statement
FONSI	Finding of No Significant Impact
GRC	John H. Glenn Research Center
HR	Human Resources

Phase 2 Environmental Assessment – NASA Shared Services Center

HVAC	Heating, Ventilation, and Air Conditioning
IT	Information Technology
JSC	Lyndon B. Johnson Space Center
KSC	John F. Kennedy Space Center
LaRC	Langley Research Center
LEED®	Leadership in Energy and Environmental Design
METRO	Metropolitan Transit Authority (Houston)
MSFC	John C. Marshall Space Flight Center
NAAQS	National Ambient Air Quality Standards
NASA	National Aeronautics and Space Administration
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO _x	Nitrogen Oxides
NPD	NASA Policy Directive
NPDES	National Pollutant Discharge Elimination System
NPR	NASA Procedural Requirements
NSSC	NASA Shared Services Center
Pb	Lead
PM	Particulate Matter
RDA	Rural Development Act
REC	Record of Environmental Consideration
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SLAMS	State and Local Air Monitoring Station
SSC	John C. Stennis Space Center
TCEQ	Texas Commission on Environmental Quality
TPY	Tons per year
THPO	Tribal Historic Preservation Office
U.S.C.	United States Code
USFWS	United States Fish and Wildlife Service

Phase 2 Environmental Assessment – NASA Shared Services Center

USGBC	United States Green Building Council
USGS	United States Geological Survey
VAV	Variable Air Volume
VOC	Volatile Organic Compound

1.0 PURPOSE AND NEED

1.1 INTRODUCTION

The National Aeronautics and Space Administration (NASA) is proposing to consolidate and co-locate certain transactional functions currently performed across NASA Centers into a new NASA Shared Services Center (NSSC) located at a new facility, on or off an existing NASA Center. Under the Proposed Action (Alternative A), the NSSC would employ approximately 500 civil service personnel and contractors after full transition over five years. The NSSC may expand by 40 percent over the long-term. Most employees currently carrying out such functions at existing Centers would remain at their respective locations and concentrate more of their attention on mission responsibilities. Some employees and contractors would be relocated to the NSSC and some would leave due to normal attrition. The Proposed Action is described in greater detail in the *NASA Shared Services Center (NSSC) Implementation Plan Report* (NSSC-RPT-02 Volume 1, September 2003) (*Implementation Plan*) and on the NSSC website.²⁶

Under the Proposed Action, the NSSC would become operational by October 2005 and require a facility comparable to a mid-size office building with associated access to transportation and utilities infrastructure, or temporary swing space during construction. No new computer “data centers” planned. The information technology (IT) functions currently consolidated to Marshall Space Flight Center (MSFC) would remain at Marshall Space Flight Center but be consolidated organizationally into the NSSC.

NASA is required to analyze the environmental consequences of the proposed action, alternatives, including the No Action alternative, and any potential mitigation, under the National Environmental Policy Act (NEPA) (Title 42, United States Code (U.S.C.) 4321-4370d), Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act (Title 40, Code of Federal Regulations (CFR) parts 1500-1508), and NASA NEPA implementing procedures (Title 14, CFR subparts 1216.1 and 1216.3), the National Historic Preservation Act, as amended (16 U.S.C. 470 *et seq.*), NASA regulations (14 CFR subpart 1216.2) for implementing Executive Order (E.O.) 11988, Floodplain Management, May 24, 1977 (42 Fed. Reg. 26951), and E.O. 11990, Protection of Wetlands, May 24, 1977 (42 Fed. Reg. 26961), and the NASA Environmental Justice Strategy (1994) for implementing E.O. 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, Feb. 11, 1994 (59 Fed. Reg. 7269, Feb. 16, 1994).

NASA began considering environmental quality early using a phased approach under §102(2)(E) of NEPA which allows preparation of environmental studies to inform decisionmaking. The first phase was a generic Environmental Assessment (EA) (Phase 1 EA), which was used internally

²⁶ <http://nssc.nasa.gov/>

for early planning purposes and in establishing siting criteria. NASA also, as part of the proposed action, committed to:

- Applying its historic preservation policy
- Implementing its sustainable design policy for new and renovated facilities (NASA 2003)
- Designating a part- or full-time NASA NSSC Environmental Manager and Energy Manager
- Developing or applying an Environmental Management System (EMS)
- Preventing or mitigating any potentially significant environmental impacts

Under the Proposed Action and Preferred Alternative (Alternative A), NASA invited each NASA Center to partner with local governments and other organizations to propose one site using common siting criteria. The NSSC could be located at a new or existing facility on or off an existing Center. Since NASA Centers do not have regional jurisdiction; each Center partnered with its respective State and local agencies, industry, and others to nominate sites meeting NASA technical criteria, including NASA's space, cost, design, and schedule requirements.

Six NASA Centers nominated sites. One site would be in a rural area, but within a Federal complex (Stennis Space Center). The other sites would be within research parks or development complexes located within urban areas, urban redevelopment, or suburban areas. No historic buildings were available that met the space and other requirements whether the nominations were in a rural or urban area. State and local governments supported each nomination. NASA reviewed all nominations, chose to carry all six sites forward for review in the draft Phase 2 EA, and allowed prospective service providers to integrate any of the nominated sites into their proposals. Prospective service providers subsequently incorporated three of the sites into proposals and these three sites, which were announced by NASA on January 7, 2005, as the draft Phase 2 EA was being finalized, will be carried forward, along with Alternative B (Virtual Consolidation) and Alternative C (No Action), in the decisionmaking process.

NASA has prepared this site-specific Phase 2 EA in accordance with the requirements of NEPA, and other laws, regulations, and E.O.'s described above, and with NASA Procedural Requirements (NPR) 8580.1, Implementing the National Environmental Policy Act and Executive Order 12114 (November 2001), and NASA Policy Directive (NPD) 8500.1A, NASA Environmental Management (revised April 2004), which require NASA to consider environmental factors throughout the lifecycle of a program, from planning through development and operations.

1.2 PURPOSE

The purpose of the Proposed Action and Preferred Alternative (Alternative A) is to locate the NSSC consistent with the recommendations of the *Implementation Plan* to use NASA resources

more strategically. The NSSC under Alternative A would foster creative synergies that would lead to greater efficiencies and reduced costs in transactional functions. The Proposed Action, by creating a functionally and environmentally efficient environment, would not only meet the need for a facility to house the NSSC, but also be consistent with and further the goals for the NSSC. The Virtual NSSC (Alternative B) would be to consolidate into an NSSC, but only in a virtual environment. The No Action alternative (Alternative C) would allow continued administrative re-organization, but not into an NSSC.

1.3 NEED

Significant workforce reductions at NASA during the 1990s negatively impacted business support services, which resulted in a need to improve efficiencies in transactional and certain specialized functions. In 2001, NASA formed a Consolidated Business Services Investigation Team to study the benefits and costs of a shared services environment at NASA, with the goal of providing higher quality and more efficient services at lower cost to NASA. In August 2002, NASA formed a NASA Shared Services Center Implementation Team to continue the work of the Consolidated Business Services Investigation Team and determine whether a NSSC would improve business at NASA. The Implementation Team reviewed six functional areas of NASA (human resources (HR), procurement, financial management, resources management, facilities, and IT) to determine which functional activities or services could be transitioned to a NSSC.

In both the April 2003, *NASA Shared Services Center (NSSC) Preliminary Implementation Plan Report*, and the September 2003 *Implementation Plan*, NASA identified a need to consolidate and co-locate certain transactional and specialized functions currently performed across NASA Centers to a new NSSC.

The Proposed Action is needed to provide a critical mass of core expertise for delivering transactional and specialty services across NASA, improve opportunities for achieving synergies across functions, and promote the continual improvement of business at NASA. The Proposed Action would provide NASA with a wide array of benefits, ranging from enhanced services, lower cost, improved timeliness, greater accuracy, and greater consistency, to more strategic management of NASA resources and improved overall performance efficiencies. The Proposed Action would be consistent with a “One NASA” approach in which NASA would operate as one team that applies many unique capabilities to the pursuit of a shared vision. The Proposed Action would also support Government initiatives to achieve more strategic management of human capital, improved resources management, greater focus on core mission performance, more reliance on competitive sourcing, improved financial management, improved IT systems, and wider use of electronic government.

1.4 SCOPE OF THE ENVIRONMENTAL REVIEW

NASA initiated a phased environmental evaluation process, beginning with a Phase 1 EA, in accordance with § 102(2)(E) of NEPA and NASA implementing procedures. The Phase 1 EA

was used in early planning and to develop the siting criteria for use by NASA Centers in nominating sites with no or minimal environmental impacts. In addition to other siting criteria, all nominations were, therefore, required to include a NASA Environmental Checklist and a draft Record of Environmental Consideration (REC). All nominations were also required to be consistent with historic preservation laws, regulations, and E.O.'s, and with NASA sustainable development policies that promote sustainable site development, water conservation, energy efficiency, materials selection, and indoor environmental quality (U.S. Green Building Council 2003). NPD 8820.3F, *Facility Sustainable Design*, provides specific instruction for incorporating sustainable design principles for all facility projects planned, designed, and constructed under NASA authority or control. Referring to NPD 8820.3F, the Director of the Facilities Engineering Division has stated, as part of NASA sustainable design goals, that as of 2006 all new building construction or major building renovation costing more than \$500,000 must meet the minimum LEED® rating of Silver and strive to meet LEED ratings of Gold²⁷ Before 2006, all new building construction or major building renovation should strive to meet LEED Silver standards.²⁸

Six Centers nominated sites. NASA reviewed the nominations and decided to carry all six sites forward for review in the site-specific Phase 2 EA. The Phase 1 EA, NASA Environmental Checklists, and draft RECs are, therefore, incorporated by reference in the Phase 2 EA. The Phase 2 EA evaluates the site specific nomination materials and supporting environmental documentation to determine whether the implementation of the NSSC at a new facility at any of the six sites would have significant impacts on the quality of the human environment, and if so, further environmental analysis needs and mitigation options. Prospective service providers were allowed to incorporate any of the six sites into their proposals, and on January 7, 2005, as the draft Phase 2 EA was being finalized, NASA announced that prospective service providers had incorporated three sites into their proposals, and that NASA had reviewed the proposals and decided to carry the three sites forward in the decisionmaking process.

The scope of the Phase 2 EA is to describe the Proposed Action and alternatives, including Virtual Consolidation (Alternative B) and the No Action alternative (Alternative C) (Chapter 2) and assess the potential of each alternative for significant environmental impacts in the following categories of human and natural resources, and to consider potential mitigation (Chapter 3):

- Facilities and Infrastructure
- Land Use
- Noise
- Air Quality

²⁷ NASA Memorandum on *Policy for LEED® Ratings for NASA New Facilities Projects*, September 5, 2003 and NPD 8820.3F, *Facility Sustainable Design*.

²⁸ The Leadership in Energy and Environmental Design (LEED) Green Building Rating System,® developed by the U.S. Green Building Council (USGBC) is a voluntary, consensus-based, national standard for developing high-performance sustainable buildings, of which NASA is a member.

- Water Resources
- Soils and Geology
- Biological Resources
- Ecological Resources
- Cultural and Historic Resources
- Environmental Justice

1.5 DECISIONS TO BE MADE

Supported by information presented in this Phase 2 EA, NASA must decide whether to implement the proposed NSSC at a single location, and if so, what mitigation measures it will take.

2.0 DESCRIPTION OF ALTERNATIVES

2.1 INTRODUCTION

NASA is proposing to consolidate HR, procurement, financial management, and IT functional activities or services currently performed across all NASA Centers into a new business unit known as the NSSC. Table 2-1 lists these functions and services. Other similar types of functional activities or services may be consolidated into the NSSC in the future. The NSSC would become operational on or about October 2005 and employ approximately 500 civil service employees and contractors at full transition after five years. The NSSC may expand later by 40 percent. Most personnel currently performing the functional activities at existing Centers would remain at their respective Centers to concentrate on Center mission activities. Some personnel would leave due to normal attrition, and some personnel would be relocated to the NSSC.

Functional activities would be transitioned to an NSSC according to the schedule described in the *Implementation Plan*, but the timing may be extended depending upon budget availability and mission priorities. All functions identified for initial consolidation to an NSSC, whether under Alternative A (Consolidation and Co-location) or B (Virtual Consolidation), would be transitioned to the NSSC within five years. Under Alternative C, the No Action Alternative, some of these functions may be consolidated as part of NASA's on-going efforts to improve efficiency, but such consolidation would not occur using an NSSC as a business unit.

Table 2-1. Functions to be Consolidated into the NSSC

Function	Services to be Consolidated
Human Resources	Personnel Program Support Employee Development and Training Support Employee Benefits and Services HR Information Systems and Report Personnel Action Processing and Recordkeeping
Procurement	Transactional Services (Grants, Cooperative Agreements and SBIR/ STTR Processing) NSSC Major Contracting Operations Workforce Development and Management Operations Procurement Electronic Business Systems
Financial Management	Accounts Payable (Payroll, Travel, Vendors) Payment Certification Accounts Receivable (Billing, Collection) Payroll, Time, and Attendance Labor Processing/Distribution Financial Reporting (General Ledger, Treasury 224, NF-1018's) Reimbursable Accounting (Collections, Closeouts) Internal Reviews for NSSC/F office
Information Technology	IFM Competency Center Services Computing and Communications Services ODIN Program Management Services

This Phase 2 EA reviews, evaluates, and summarizes the environmental documentation prepared and submitted by the six proposing NASA Centers and their partners, as part of the NSSC nominations.

The numbering of the following NSSC alternatives corresponds to numbering used for the alternatives described in Chapter 2 of the NASA Phase 1 EA. The alternatives of using existing buildings on and off-site, Alternatives A.1 and A.3, respectively, that were discussed in the Phase 1 EA, are not being carried forward since no existing buildings were available to meet the purpose and need in the timeframe specified. All of the six proposed sites that are discussed in this Phase 2 EA involve new construction. Alternative A.2 indicates that the NSSC would be located in a new building at an existing NASA Center. Alternative A.4 indicates that the NSSC would be located in a new building at an off-site location. Existing buildings would be used as swing space during construction of the NSSC. All of the six proposed sites would meet the purpose and need of the NSSC, as described in this Phase 2 EA and the NSSC Site Nomination Guidelines, and thus were analyzed in this Phase 2 EA. Prospective service providers were allowed to include any of the nominated sites in their proposals. On January 7, 2005, NASA announced that three sites had been included in proposals (bold type).

Alternative A: Consolidation and co-location of functions at an NSSC:

On an existing NASA Center, new construction required (Alternative A.2 in Phase 1 EA):

A.2.1 NASA Johnson Space Center (JSC) in Clear Lake, Texas.

A.2.2 NASA Stennis Space Center (SSC) in Hancock County, Mississippi.

Not on an existing NASA Center, new construction required (Alternative A.4 in Phase 1 EA):

A.4.1 Aerospace Technology Park, City of Brook Park, Ohio, nominated by the Glenn Research Center (GRC).

A.4.2 Central Florida Research Park (CFRP) in Orlando, Florida, nominated by the Kennedy Space Center (KSC).

A.4.3 City Center at Oyster Point, in Newport News Virginia, nominated by the Langley Research Center (LaRC).

A.4.4 Cummings Research Park (CRP) in Huntsville, Alabama, nominated by the Marshall Space Flight Center (MSFC).

Alternative B: Consolidation of functions into a virtual NSSC

Alternative C: No consolidation of functions into an NSSC (No Action alternative)

2.2 ALTERNATIVE A: CONSOLIDATION AND CO-LOCATION OF FUNCTIONS AT AN NSSC

NASA would consolidate selected transactional and specialty functions currently performed at existing NASA Centers to a site on or off an existing NASA Center. Under each of the nominations, the NSSC would be set up within a new building with associated parking and infrastructure. Temporary space would be provided in the interim.

2.2.1 Alternative A.2.1: NSSC on-site at NASA Johnson Space Center

The NASA Johnson Space Center (JSC) is located in Clear Lake, Texas, and is the hub of NASA's human space flight programs. Approximately 3,000 civil service employees and more than 12,000 contractors work on-site at Johnson Space Center.

Participants and collaborators involved with Johnson Space Center in the proposed NSSC facility project are:

- State of Texas
- Texas Workforce Commission
- Bay Area Houston Economic Partnership (BAHEP)
- The WorkSource.

2.2.1.1 NSSC Location

NASA Johnson Space Center has proposed that NASA locate the NSSC on-site. BAHEP through a grounds easement would construct a new NSSC facility at Johnson Space Center and lease the facility to NASA. The NSSC would be located outside of NASA Johnson Space Center security fence and near the NASA Visitors Center in the City of Clear Lake. This site is currently undeveloped, and consists of an open area with some vegetation such as trees and shrubs.

Figure 2-1 illustrates the NASA Johnson Space Center site location.

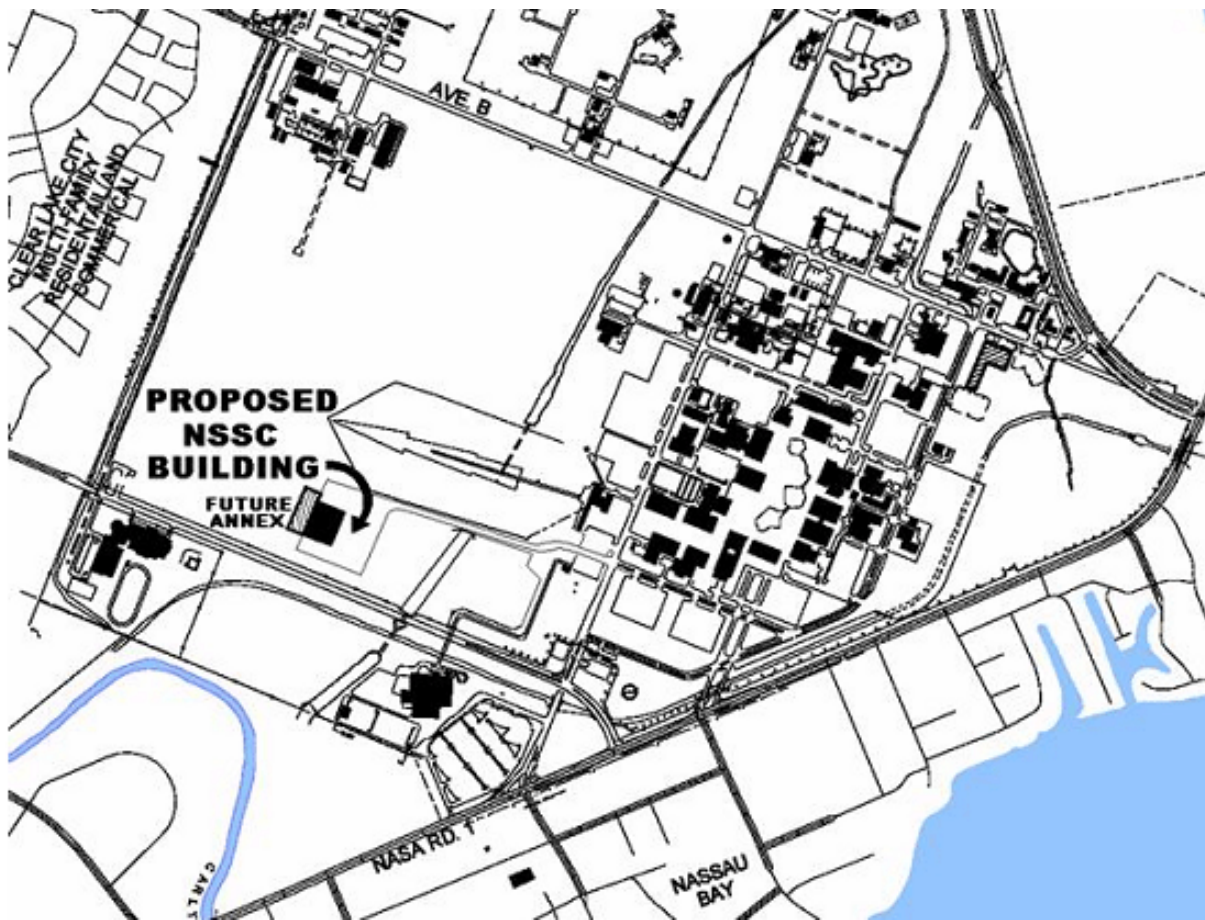


Figure 2-1. NASA Johnson Space Center (A.2.1)

2.2.1.2 Description of NSSC

The NSSC facility would be the largest and newest Class A office facility in the Clear Lake area. The NSSC would have an aesthetically pleasing, environmentally friendly exterior and interior design. The facility would be a five-story building and would have a total of 12,397 m² (133,440 ft²).

The entire facility and floor-by-floor designs would meet Class A requirements and, at a minimum, would be certified as a LEED® Silver facility.

The first floor would house two main entrances (north and south), the main lobby, the main mechanical room, a cafeteria/dining area, a loading dock, a mailroom, and office space for 2 people (workstations and private offices). The second, third, fourth, and fifth floors would each house satellite mechanical rooms, conference rooms, breakrooms, and office space for 120 people (workstations and private offices). Four central elevators (three personnel and one freight) would be provided for movement of personnel and equipment between floors. A flexible

communications infrastructure would provide communications and data hubs on each floor with communications closets for ease of reconfiguration or upgrades. Cubicles and workstations would be located on the exterior perimeter of each floor, making maximum use of ambient lighting; private offices, conference rooms, and common areas comprise the interior of each floor. If required, an annex would be constructed on vacant land next to the primary NSSC to allow for future expansion of the NSSC.

Consistent with E.O. 13112, Invasive Species and E.O. 13148, Greening the Government Through Leadership in Environmental Management, landscaping would consist of native plants and trees that have good resistance to disease and insects.

2.2.2 Alternative A.2.2: NSSC on-site at NASA Stennis Space Center

NASA Stennis Space Center (SSC) is located near the Gulf of Mexico in western Hancock County, Mississippi, approximately 89 kilometers (km) (55 miles (mi)) northeast of New Orleans, Louisiana and approximately 48 km (30 mi) west of Biloxi/Gulfport, Mississippi. NASA Stennis Space Center occupies a 5,520 hectare (ha) (13,800 acres (ac)) central site, which is surrounded by a 50,000 ha (125,001 ac) acoustic buffer. The Stennis Space Center is described as a Federal City in which operational facilities, services, and costs are shared by NASA, as the host agency, and other agencies. NASA's rocket propulsion testing is conducted at Stennis Space Center. Other agency tenants at NASA Stennis Space Center conduct laboratory and industrial operations, and there are also a number of services such as banks, service stations, and higher education centers.

Participants and collaborators involved with NASA Stennis Space Center in the proposed NSSC facility project are:

- State of Mississippi
- State of Louisiana.

2.2.2.1 NSSC Location

NASA Stennis Space Center has proposed that the State of Mississippi would construct a new NSSC facility on a 1.6 ha (4 ac) site to the west of Building 1103 at NASA Stennis Space Center, and lease the facility to NASA. The site is currently a 375-car parking lot. The NSSC would be connected to Building 1103 via a covered walkway. Building 1103 is owned by the State of Mississippi and is used in part for NASA Stennis Space Center tenant education programs. Building 1103 currently houses the Mississippi Technology Transfer Center and the University of Southern Mississippi Center of Higher Learning Visualization Center. Building 1103 is in the Engineering and Administration area of NASA Stennis Space Center and consists of a complex of buildings located outside of the test complex evacuation limits containing the main administration building, offices, laboratories, computer facilities, a library, an auditorium and a cafeteria.

Figure 2-2 illustrates the NASA Stennis Space Center site location.



Figure 2-2. NASA Stennis Space Center (A.2.2)

2.2.2.2 Description of NSSC

The NSSC building would consist of a pre-cast concrete structure and utilize a mix of pre-cast concrete with full glass elements on the façade. The NSSC would have three large, three- story

atriums. Each atrium would be approximately 16.6 meter (m) x 16.6 m (50 feet (ft) by 50 ft) and would extend from the ground level, terminating at skylights. From the main lobby, employees and visitors would have immediate access to core building facilities such as elevators, stairwells, restrooms, corridors, offices, and conference rooms. Each floor would have a flexible building plan with movable hard walls and modular office furniture. The NSSC would have an area of 12,452 m² (135,000 ft²). The NSSC would be a LEED® Gold Class A facility, designed for low energy consumption using natural light and utilizing recycled materials in its construction.

NASA has considered the potential need for future expansion of the NSSC. If expansion were required, additional office space would be provided in the area to the west of the NSSC and would be connected to the NSSC. Landscaping would consist of native plants.

2.2.3 Alternative A.4.1: NSSC off-site at Aerospace Technology Park

NASA Glenn Research Center (GRC) primary offices and laboratories are located at Lewis Field, a 140 ha (350 ac) site, adjacent to Cleveland-Hopkins International Airport in Brook Park, Ohio. NASA Glenn Research Center also includes Plum Brook Station, a 2,560 ha (6,400 ac) site near Sandusky, Ohio.

Participants and collaborators involved with NASA Glenn Research Center in the proposed NSSC facility project are:

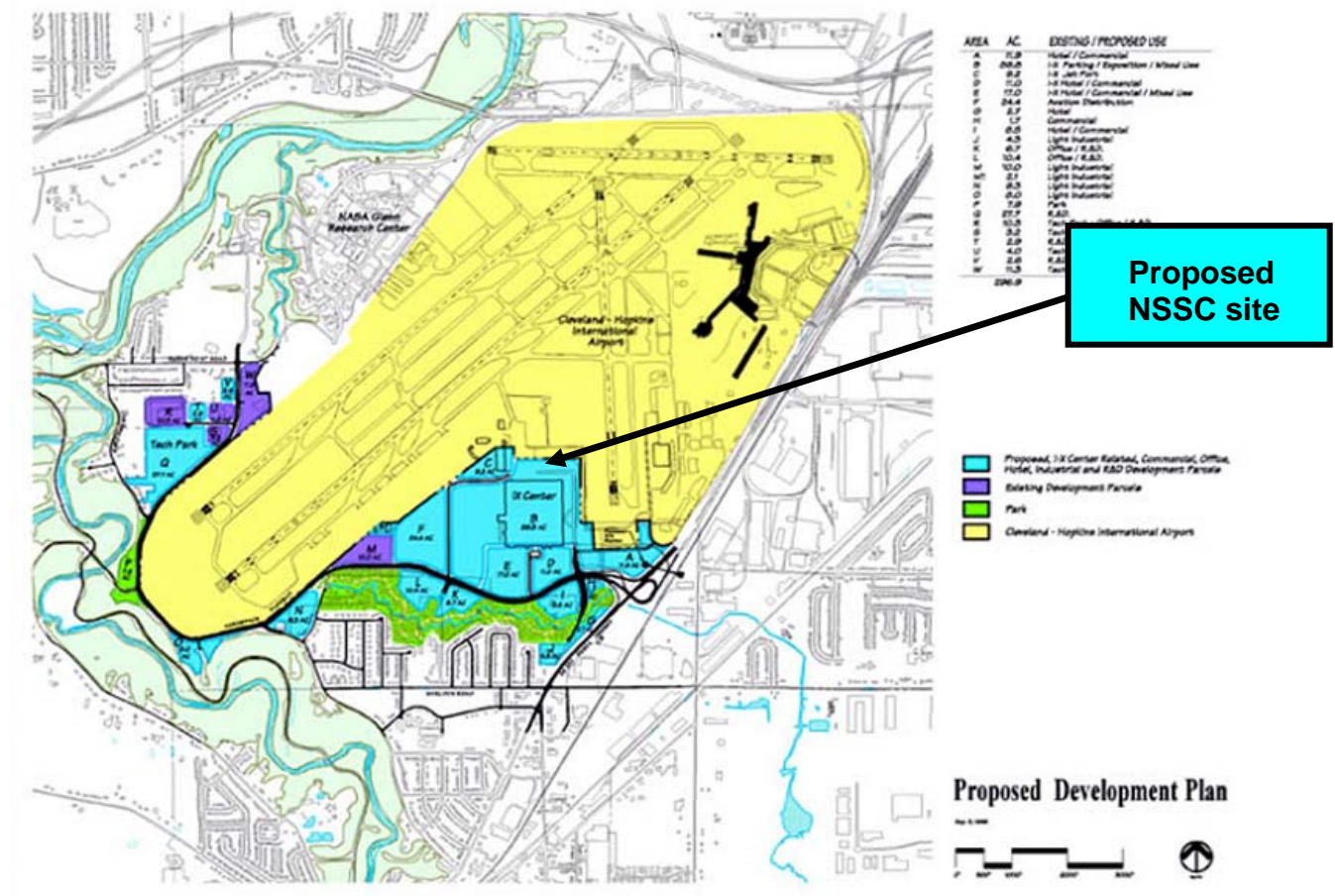
- City of Brook Park
- State of Ohio
- Greater Cleveland Partnership (regional chamber of commerce)
- Team NEO (Northeast Ohio) (regional economic development)
- Ohio Congressional Delegation
- Red Team (community group)
- University of Akron
- Case Western Reserve University
- Kent State University
- Cleveland State University
- Cuyahoga County Community College
- Lorain County Community College

2.2.3.1 NSSC Location

NASA Glenn Research Center has proposed that NASA locate the NSSC off-site in the nearby Aerospace Technology Park, located across Aerospace Technology Parkway from NASA Glenn

Research Center-Lewis Field in the City of Brook Park, Cuyahoga County, Ohio.²⁹ NASA would lease the NSSC facility. This area is currently wooded and contains 3.8 ha (9.6 ac) of wetlands. A portion of the wetlands would be impacted by construction. Off-site mitigation is planned. The building would have an efficient building layout and be LEED® Silver certified.

Figure 2-3 illustrates the NSSC site location at Aerospace Technology Park.



constructed of fly ash content, and carpet interior drywall, ceiling tile and coverings made from recycled material, and would also use low or no volatile organic compound (VOC) paints, adhesives, and other similar materials. Entryways and access to all areas of the building would be suitable for use by people with disabilities. The exterior walls would be air tight, well insulated thermally, and would include extensive shading elements and low emissive coefficient glazing. This would reduce the cost of heating and cooling the building and maximize energy efficiency. Recyclable materials would be used to construct the building wherever possible.

The NSSC building would be conducive to phased construction and occupancy and could easily be expanded by adding an additional pod onto the atrium. There would be extensive plantings on the roof, and attractive, low maintenance native vegetation landscaping around the building.

The NSSC would meet NASA's minimum LEED® rating of Silver and would strive to meet a LEED® rating of Gold.

2.2.4 Alternative A.4.2: NSSC off-site at Central Florida Research Park

NASA Kennedy Space Center (KSC) is located approximately 45 minutes from Orlando, Florida.

Participants and collaborators involved in the proposed NSSC facility project are:

- State of Florida
- Metro Orlando Economic Development Commission
- Orange County Research & Development Authority/Central Florida Research Park
- Taurus Investment Holdings, LLC
- University of Central Florida
- Valencia Community College
- Orange County Government
- Progress Energy.

2.2.4.1 NSSC Location

NASA Kennedy Space Center has proposed that NASA locate the NSSC off-site on an 2.57 ha (6.43 ac) undeveloped parcel at the intersection of Scenic Drive and Technology Parkway in the heart of the Central Florida Research Park (CFRP). NASA would lease the facility.

The CFRP is a campus-like environment for business and is located adjacent to the University of Central Florida. Businesses that desire a university relationship can purchase land in the Research Park on which to construct a facility or they can lease space for office, laboratory or light manufacturing uses. The CFRP occupies an area of 410.8 ha (1,027 ac) and has 45

buildings on-site. Currently, 85 companies have located on-site and employ more than 8,500 employees.

Figure 2-4 illustrates the Central Florida Research Park location.

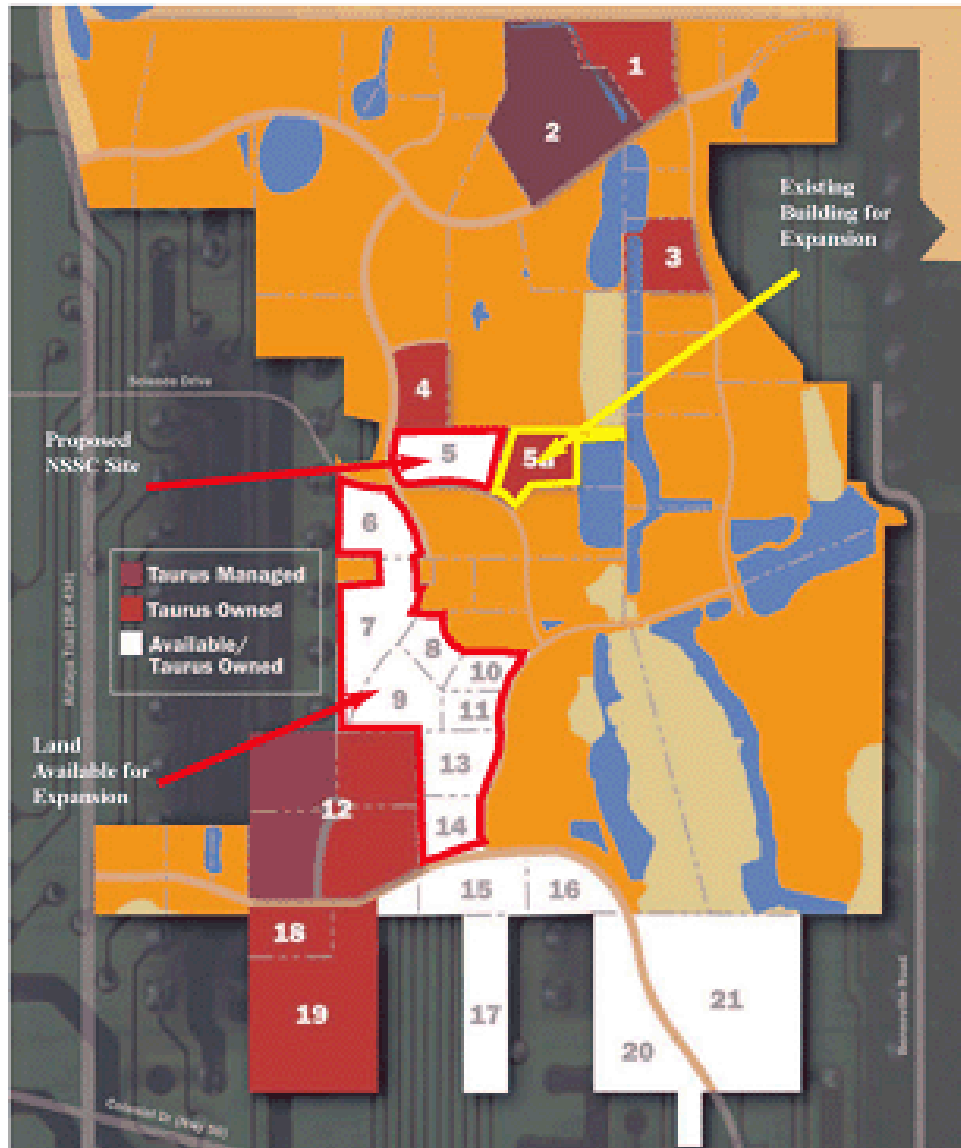


Figure 2-4. Central Florida Research Park (A.4.2)

2.2.4.2 Description of NSSC

The new NSSC facility would be a three-story building and would be a 12,542 m² (135,000 ft²) Class A suburban office building.

The NSSC would be constructed of pre-cast or tilt wall panels and reflective glass, and would be designed to meet stringent design guidelines set forth by the CFRP, and to compliment the adjacent high tech facilities. Additional design features would provide for ADA accommodation.

Special considerations have been put into the design of the NSSC to ensure that at a minimum it meets the requirements of a LEED® rating of Silver.

2.2.5 Alternative A.4.3: NSSC off-site at City Center at Oyster Point

NASA Langley Research Center (LaRC) is located in Hampton, Virginia. Participants and collaborators in the proposed NSSC facility project are:

- Commonwealth of Virginia
- City of Newport News
- Economic Development Authority of the City of Newport News, VA
- Newport News Town Center, LLC
- NAI Harvey Lindsay Commercial Real Estate
- Peninsula Alliance for Economic Development

2.2.5.1 NSSC Location

NASA Langley Research Center has proposed that NASA locate the NSSC facility off-site in City Center at Oyster Point, Newport News, Virginia. The proposed site is approximately 3.5 ha (8.8 ac) of land located to the immediate south of the intersection of Town Center Drive. The City Center at Oyster Point is a planned mixed-use (New Urbanist) development. The property is formerly a U.S. Army munitions storage facility and consists of two separate lots identified as Blocks 6 and 7. NASA would lease the facility.

Figure 2-5 illustrates the NSSC site location at City Center at Oyster Point.



Figure 2-5. City Center at Oyster Point (A.4.3)

2.2.5.2 Description of NSSC

The proposed NSSC facility would be a five-story office building. The approximately 12,438 m² (133,884 ft²) facility would contain all core building areas, first floor lobby, sprinkler rooms, electrical rooms, telephone rooms, janitor closets, elevator equipment room, toilet rooms, and stairs. The building exterior would be constructed of brick with pre-cast architectural concrete accents and fixed aluminum and reflective glass windows and/or curtain walls. There would be landscaping around the building with planters to provide seasonal color and ornamentation.

The NSSC would meet NASA's minimum LEED® rating of Silver and would strive to meet a LEED® rating of Gold.

2.2.6 Alternative A.4.4: NSSC off-site at Cummings Research Park

NASA Marshall Space Flight Center (MSFC) is located in Huntsville, Alabama. NASA Marshall Space Flight Center occupies more than 720 ha (1,800 ac) on the Redstone Army Arsenal in Huntsville and employs more than 2,700 civil servants and more than 4,000 on-site contractors.

Participants and collaborators involved with NASA Marshall Space Flight Center in the proposed NSSC facility project are:

- City of Huntsville
- Industrial Development Board of the City of Huntsville

Phase 2 Environmental Assessment – NASA Shared Services Center

- State of Alabama
- Madison County, Alabama
- Regions Bank
- Chamber of Commerce of Huntsville/Madison County

2.2.6.1 NSSC Location

NASA Marshall Space Flight Center has proposed that NASA locate the NSSC facility off-site on an undeveloped site within the Cummings Research Park (CRP), Huntsville, Alabama. The CRP is the second largest research park in the United States, and is located on the northwest corner of the intersection of Old Madison Pike and Research Park Boulevard and across Interstate 85 from NASA Marshall Space Flight Center. The proposed site is roughly rectangular, covers approximately 41.6 ha (104 ac) in area, and was used for farming.

Figure 2-6 illustrates the CRP site location.

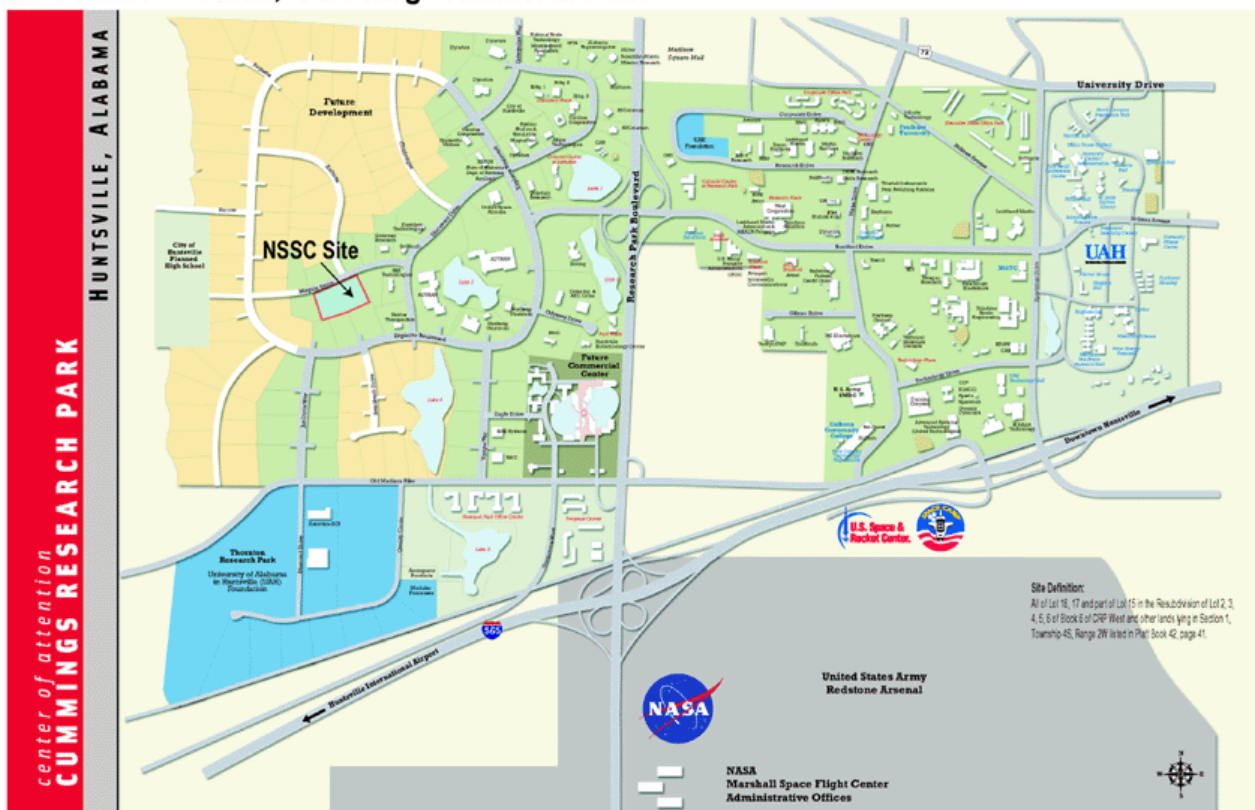


Figure 2-6. Cummings Research Park (A.4.4)

2.2.6.2 Description of NSSC

The NSSC facility would be constructed by the City of Huntsville, Madison County, and the State of Alabama, and leased to NASA.

The NSSC facility would be a five-story building designed to optimize computer-based office functions with raised floors and flexible open office areas that maximize natural lighting.

The NSSC would meet NASA's minimum LEED® rating of Silver and would strive to meet a LEED® rating of Gold.

2.2.7 Alternative B: Virtual Consolidation

NASA would establish the NSSC in a virtual environment; however, no more than minor changes would be expected to occur in the level of operations at existing NASA Centers. Some personnel and equipment may be reallocated among Centers. New personnel may be employed to carry out consolidated functional alternatives, allowing other personnel to concentrate on Center mission activities.

Virtual consolidation can result in improved services and savings; however, NASA has found that, in general, greater savings, efficiencies, and economies of scale are achieved over the long term with physical consolidations. If the workforce is not co-located, it becomes more difficult to maintain standard processes, leverage expertise, implement best practices, achieve effective spans of control, and balance workloads effectively. Thus, virtual consolidation would not directly meet the NSSC goal of creating a critical mass of core expertise to manage and perform shared services. These considerations are described in greater detail in the *Implementation Plan*.

Over time NASA may need to make minor modifications to existing Center facilities (for example, heating, ventilation, telecommunications, security, parking, interior remodeling) or construct small, new facilities (such as storage sheds or security gates) or lease existing space to accommodate NSSC activities at affected Centers. No new computer "data centers" are proposed. NASA anticipates that such modifications may be categorically excluded from further environmental review as minor facility construction or on-going activities of a center, depending on the results of the environmental evaluation required under NASA regulations.³⁰

2.2.8 Alternative C: No Action

NASA would not establish an NSSC as described in the *Implementation Plan*. NASA may, however, continue to consolidate some functions, and associated functional activities and services, as part of on-going efforts to improve efficiency and conserve resources. For example, to reduce costs and improve services NASA has centralized a number of administrative services,

³⁰ http://www.hq.nasa.gov/office/codej/codeje/je_site/about_us/about_us.html

such as international travel, relocation services, and payroll. Each service is, however, centralized at a different NASA Center, rather than being consolidated in a single business organization. The No Action alternative would, therefore, not directly meet the NSSC goal of creating a critical mass of core expertise to manage and perform shared services, or provide as great an improvement in service quality, reduction in costs, or a framework for a continuous improvement culture.

Under the No Action Alternative, NASA may over time need to make minor modifications to existing facilities (for example, heating, ventilation, telecommunications, security, parking), construct small, new facilities (such as storage sheds or security gates), or lease limited office space to accommodate activities centralized at affected Centers. NASA anticipates that activities under this alternative would be categorically excluded, depending on the outcome of the environmental evaluation. Sites located within research parks and redevelopment sites (e.g. Cummings Research Park, Aerospace Technology Park, Central Florida Research Park, and City Center at Oyster Point) would be developed for other tenants. The NASA Stennis Space Center site would remain a parking lot and the NASA Johnson Space Center site may be developed in the future, but no alternative plans have been developed.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 SCOPE OF ANALYSIS

3.1.1 Avoidance or Mitigation of Environmental Impacts

NASA, in its mission and under 14 CFR 1216, Environmental Quality, is committed to environmental quality. Further, to demonstrate efficiencies not only in functional performance, but also in facility management supporting the NSSC, and to meet the timetable for implementation of the NSSC, NASA's siting criteria include the ability to mitigate environmental impacts in the design and operation of the NSSC to below applicable significance levels.

In this chapter, measures to mitigate potential impacts are described in general terms for each resource. At a minimum, Alternative A involving consolidation and co-location would include meeting NASA Sustainable Facilities Design practices, designating a part- or full-time NASA NSSC Environmental Manager and Energy Manager, and implementing an Environmental Management System (EMS). Under Alternatives B and C, the associated Center's EMS, overseen by Center Environmental Managers, would apply.

An EMS is a system that:

- Incorporates people, procedures, and work practices in a formal structure to ensure that the important environmental impacts of the organization are identified and addressed,
- Promotes continual improvement by periodically evaluating environmental performance,
- Involves all members of the organization as appropriate, and
- Actively involves senior management in support of the environmental management program.

NASA's EMS policies and guidelines are described in NPR 8553.1, NASA Environmental Management System (EMS) that was developed in response to E.O. 13184, Greening the Government Through Environmental Leadership. An EMS applicable to an office environment would concentrate on such tools as alternative fuel vehicles, fuel handling, environmentally beneficial landscaping, energy and water management, solid waste reduction, recycling, and disposal, vehicle trip reduction, and compliance with required consultations, communication, coordination and permits, regulations, and policies.

For all alternatives, through implementation of an EMS, application of sustainable design policies and historic preservation laws, regulations, and Executive Orders, most potential environmental impacts, associated public controversy on environmental grounds, and risks to public health and safety of any of the alternatives would be avoided or minimized.

3.2 ALTERNATIVE A.2.1 NSSC ON-SITE AT NASA JOHNSON SPACE CENTER

3.2.1 Facilities and Infrastructure

3.2.1.1 Transportation and Traffic

3.2.1.1.1 Affected Environment

The Johnson Space Center NSSC nomination states that regional access to the Houston-Clear Lake area is dominated by highways and an extensive mass transit system. Five major freeways and two freeway loops are located in the south Houston region (U.S. 59, Interstate 45, U.S. 288, State Highway 3, State Highway 146, Interstate 610 Loop and Beltway 8). These highways serve as the major links proposed between the Clear Lake area and downtown Houston. Both NASA 1 Parkway and Bay Area Boulevard (major thoroughfares from Interstate 45 to Clear Lake area) are 0.8 km (0.5 mi) from the entrance to the NSSC facility.

Most Johnson Space Center employees live in the Houston-Clear Lake area and commute to the Johnson Space Center via their personal vehicles; the average commute time is 10 to 15 minutes. The commute time from downtown Houston to Johnson Space Center is approximately 30 minutes.

Park and Ride services are provided by Houston's Metropolitan Transit Authority (METRO), which offers convenient commuting alternatives for residents of the local area. In addition to bus services at the Park and Ride facilities, METRO operates an extensive system of bus routes in the Houston-Clear Lake area, carpooling and vanpooling matching services, and special buses for use by disabled persons. The new Houston METRORail system opened on January 4, 2004 and plans an expansion to reach all areas of Houston including the Hobby Airport-Clear Lake region.

The proposed NSSC site is located near the entrance of Johnson Space Center, outside the main Johnson Space Center gate. New parking would be required to accommodate approximately 900 vehicles at full implementation of the NSSC. The site is large enough to accommodate an additional parking area if the NSSC expands in the future.

3.2.1.1.2 Environmental Consequences

The environmental information provided in the Johnson Space Center NSSC nomination stated that during construction of the proposed NSSC, traffic levels in the local area would temporarily increase. However, necessary precautions (such as developing a transportation management plan

to manage construction traffic) would be implemented to eliminate, mitigate or minimize all potential traffic hazards associated with construction.

The Johnson Space Center NSSC nomination stated that operation of the NSSC would generate a substantial number of additional vehicle trips each day. Given the existing road network in the area surrounding Johnson Space Center, the nomination stated that the increase in traffic would not have a substantial impact upon existing transportation systems. Impacts could be minimized further if NASA adopted incentives such as telecommuting, public transportation use, carpooling, and alternative fueled vehicles use.

3.2.1.2 Solid and Hazardous Waste Generation and Management

3.2.1.2.1 Affected Environment

NASA Johnson Space Center generates and stores large quantities of solid and hazardous wastes and is registered by the Texas Commission on Environmental Quality (TCEQ). NASA has procedures to minimize how much hazardous waste is produced, control its handling, and avoid environmental pollution. Waste solvents and oils are generated by maintenance activities such as painting, compressor cleaning, and degreasing. Hazardous waste is held at the site for less than ninety days under permit by the TCEQ. These containerized wastes are stored at the hazardous waste storage facility and metal finishing wastes are collected in tanks until they are removed for disposal at a permitted, NASA Johnson Space Center audited and authorized off-site disposal facility.

Other hazardous wastes include sludge from oil-water separators, wastewater containing hazardous organic compounds, lab packs, plating filter cake, contaminated filter media, used batteries, and contaminated rags. Hazardous wastes are also generated when spills are cleaned up and contamination is removed.³¹ Universal wastes, mercury-containing fluorescent lamps and used lead-acid and nickel cadmium batteries, are generated at the facility and sent off-site for recycling.

NASA Johnson Space Center currently generates solid waste such as colored paper, cardboard, wood, recyclable paper products, cafeteria waste, construction and facility maintenance wastes, and plastic and similar trash are picked up by a commercial transporter for disposal at a local municipal landfill. Mixed white and color paper and cardboard are collected in bins and are sent to a recycling facility. Wooden pallets are collected for reuse and refurbishment rather than disposal. Plant trimmings are collected and composted or mulched for reuse in on-site landscaping.

³¹ Brown & Root, Environmental Resources of Johnson Space Center, December 2001

3.2.1.2.2 Environmental Consequences

The NSSC would generate types of solid waste and recyclable wastes that are already generated by office facilities at NASA Johnson Space Center. The NSSC would be constructed and operated in a way that reduces waste generation and encourages recycling and reuse of materials. Existing waste management and recycling companies would provide the NSSC with collection and disposal services. No major change in the level of current waste and recyclable materials collection services would be required.

If the NSSC were to use hazardous materials, such as paints and solvents, and to produce hazardous wastes as part of the construction activities, the management of these materials would be the responsibility of the developer, who would be required to follow normal management practices as required by State and local agencies. According to the Johnson Space Center NSSC nomination, neither construction nor operation of the NSSC would generate or require the disposal of hazardous, toxic, or radioactive materials or wastes.

If emergency power is required, in the event of an electrical outage, unscheduled maintenance, or an emergency, an emergency generator of 1500 Kw (Kv) fueled by a diesel storage tank of sufficient capacity would provide uninterrupted service up to approximately eight hours duration.

The Johnson Space Center NSSC nomination stated that pesticides would not be used on the landscaped areas.

3.2.1.3 Public Services and Utilities

3.2.1.3.1 Affected Environment

Local Houston utility companies provide power, natural gas, potable water and sewage treatment to NASA Johnson Space Center. Lines belonging to these utility companies are not currently installed at the proposed site of the NSSC. For example, the existing NASA Johnson Space Center electrical grid would provide fully redundant primary power to the NSSC, with a backup generator located on the first floor of the NSSC building providing emergency power. The NSSC facility would be tied into the NASA Johnson Space Center Operations Control Center, which controls and monitors facility power, cooling, heating, and energy management and control. Public services such as fire, ambulance, and security response are currently available at NASA Johnson Space Center.

3.2.1.3.2 Environmental Consequences

Providing power, natural gas, potable water and sewage infrastructure to the NSSC would not adversely impact local Houston utility companies since the NSSC would consume relatively small quantities of electricity, gas and water. Installation of new utilities would be conducted in a way that avoids or minimizes environmental impacts. The NSSC would be subject to Federal energy reduction and water conservation goals established in the National Energy Conservation Policy Act of 1992, amended, E.O. 13123, Greening the Government Through Efficient Energy

Management, June 8, 1999, and NPR 8570.1 Energy Efficiency and Water Conservation. NASA would also designate a part- or full-time NASA NSSC Energy Manager.

Public services such as fire, ambulance, and security are currently available at NASA Johnson Space Center. The Johnson Space Center NSSC nomination indicated that these services would need to be expanded to include protection of the NSSC. This expansion of services could take place without impacting the public service provider or NASA Johnson Space Center.

3.2.1.4 Communication

3.2.1.4.1 Affected Environment

Communication services, including but not limited to conventional telephone service, Internet service, and other data transmission services, are available at NASA Johnson Space Center through local providers, but are not presently installed at the site of the proposed NSSC.

3.2.1.4.2 Environmental Consequences

Communication services would need to be extended to the NSSC with no or minimal impact to the environment. An existing NASA contract would provide computer and telephone equipment.

3.2.2 Land Use

3.2.2.1 Affected Environment

The site of the proposed NSSC is currently undeveloped, and consists of an open area with some vegetation, such as trees and shrubs. Land use surrounding the site of the proposed NSSC consists of Space Center Houston (a space oriented entertainment and learning center), a Clear Creek Independent School District public middle school, and a City of Houston Fire Station.

NASA Johnson Space Center is adjacent to parks, recreational areas and educational land uses to the north, including Armand Bayou Nature Center, Bay Area Park, and the University of Houston – Clear Lake. Several technology parks adjoin NASA Johnson Space Center to the north, northwest and east. Residential areas of Clear Lake City are located to the northwest and west. Commercial and industrial land uses dominate the areas to the southwest and south of the NASA Johnson Space Center.³²

3.2.2.2 Environmental Consequences

The NSSC would result in alteration of the existing or planned land use, with construction of a multi-story building and a parking lot to accommodate up to 500 vehicles. The proposed NSSC would not impact parks or recreation areas.

³² Brown & Root, 2001

3.2.3 Noise

3.2.3.1 Affected Environment

The main noise sources at NASA Johnson Space Center include a central heating and cooling plant, cooling towers, auxiliary chiller facility and the emergency power building. The other sources are the vibration and acoustic test facility, the atmospheric re-entry materials and structures evaluation facility and the propulsion test facility. NASA Johnson Space Center's noise sources do not exceed typical conversation levels of 65dB(A) at receptors outside the Center.³³

3.2.3.2 Environmental Consequences

The Johnson Space Center NSSC nomination stated that because the site of the NSSC is currently undeveloped, noise would increase more than 10 percent. Noise levels produced by Johnson Space Center operations and activities do not exceed typical conversation levels of 65 dB(A) at receptors outside the Center, and are not anticipated to be higher at the proposed NSSC site, except during construction. NASA would adhere to local noise ordinances under the Noise Control Act of 1972. Hearing protection measures would be implemented as needed.

3.2.4 Air Quality

3.2.4.1 Affected Environment

The Federal Clean Air Act §176(c), 40 CFR part 51, subpart W, and 30 Texas Administrative Code §101.30 require that Federal agencies must not approve a project that does not conform to the State Implementation Plan (SIP) for bringing air quality into attainment with national standards and maintaining air quality. NASA Johnson Space Center is located in the Houston/Galveston severe ozone non-attainment area. Sources of air pollution at Johnson Space Center include combustion sources (e.g., boilers), surface coating activities, laboratory hood vents, photograph processing, degreasing, woodworking, metal parts cleaning and fugitive emissions due to chemical product usage at various locations.³⁴ The TCEQ has included in the SIP several control measures to reduce emissions of nitrogen oxide (NO_x) and VOC to meet the National Ambient Air Quality Standards (NAAQS). Johnson Space Center indicated that it has performed a preliminary review of direct and indirect air emissions to assess whether or not the NSSC project at Johnson Space Center would trigger a General Conformity determination. Direct air emissions include construction equipment used during land clearing, building construction, and parking lot construction, and a backup diesel generator. Indirect air emissions include increased vehicular traffic due to commuting employees privately owned vehicles (POV).

³³ Ibid

³⁴ Ibid

NASA performed a rough estimate of the projects conformity related air emissions using the Air Conformity Applicability Model (ACAM).³⁵

NASA may be required to perform a refined General Conformity analysis prior to deciding to locate the NSSC at Johnson Space Center. However, preliminary results suggest that the NSSC project would not hamper local efforts to control air pollution because the sum of direct and indirect emissions during the peak year was estimated to be 17.1 metric tons per year (19 tons per year (TPY)) of NO_x and 3.6 metric tons per year (4 TPY) of VOC, which are less than the *de minimus* levels (i.e., levels which are so low that no regulatory authorization is required) of 22.5 metric tons per year (25 TPY) of NO_x or VOC.

3.2.4.2 Environmental Consequences

The Johnson Space Center NSSC nomination stated that the NSSC would not have any impact on the local or regional climate. Anticipated air emissions would be generated from the exhaust stack of a diesel fueled emergency generator of approximately 1500 kilowatt capacity, providing up to eight hours of power during an electrical outage, unscheduled maintenance, or an emergency. The NSSC would not generate odors or smoke.

If emissions from construction equipment and grading operations were found to exceed applicable *de minimis* levels, then NASA would phase construction and implement other best management practices (BMP) to reduce emissions.

3.2.5 Water Resources

3.2.5.1 Affected Environment

The landscape surrounding Johnson Space Center includes many tidal streams and estuaries within Galveston Bay. Galveston Bay is recognized by the U.S. Environmental Protection Agency (EPA) as an estuary of national significance and was included in the National Estuary Program in 1989. Clear Lake is at the southeast corner and Mud Lake and Armand Bayou are northeast of Johnson Space Center. Armand Bayou is a possible scenic river as defined by the Wild and Scenic Rivers Act, although it is not listed by the U.S. Department of the Interior. Cow Bayou is southwest; and Horsepen Bayou is north of Johnson Space Center.

Storm-water runoff in the developed areas of the Johnson Space Center is managed by an existing storm-water management system.³⁶ Runoff from the proposed NSSC would be to Cow Bayou and then to Clear Lake.

³⁵ ACAM Version 4.0.3, Air Force Center for Environmental Excellence. ACAM incorporates the USEPA Mobile 6 on-road mobile source model, and construction emission estimates use built-in algorithms developed by South Coast Air Quality Management District (AQMD) and Santa Barbara Air Pollution Control District (APCD).

³⁶ Brown & Root, 2001.

NASA Johnson Space Center is on relatively flat land consisting of large paved sections and grass-covered areas that are not prone to erosion. Paving and maintenance ensure that erosion is minimized. Ditches are either paved or heavily vegetated and are not affected by erosion. Johnson Space Center has four drainage systems where runoff from paved areas, grassland areas, and roofs goes into stormwater sewers and open ditches.

Johnson Space Center had been permitted to discharge stormwaters associated with industrial activities under the terms and conditions of the National Pollutant Discharge Elimination System (NPDES) Multi-Sector General Permit. This permit expired in September of 2000, and in August 2001, an equivalent permit, the State of Texas reissued Texas Pollutant Discharge Elimination System General Permit (Permit No. TXR050000).

3.2.5.2 *Environmental Consequences*

Construction of the NSSC would temporarily increase the amount of sedimentation and pollutants that could migrate into nearby surface water systems. During construction activities, impacts to surface waters in the area would be minimized by ensuring that BMPs are initiated and maintained to control erosion and sedimentation.

The Johnson Space Center NSSC nomination stated that operation of the NSSC would result in stormwater discharges from impervious surfaces such as parking areas and roofs. A surface water management system would be provided to treat runoff from the new impervious areas of the facility. This system may include stormwater detention ponds.

3.2.6 Soils and Geology

3.2.6.1 *Affected Environment*

NASA Johnson Space Center is on a nearly level plain of clay and loam prairie soils classified as Lake Charles clay, Bernard clay loam, Midland silty clay loam, and Beaumont clay. NASA Johnson Space Center was entirely graded in 1961 and fill dirt was added to the soil profile in some areas (Brown & Root, 2001). Surveys of sites surrounding the site of the proposed NSSC do not indicate site contamination or a history of site contamination.

3.2.6.2 *Environmental Consequences*

According to the Johnson Space Center NSSC nomination, construction of the NSSC would disturb approximately 0.24 ha (0.61 ac) and 2.2 ha (5.5 ac) during construction of the NSSC building and parking lot, respectively. Erosion control measures would be used during construction to minimize erosion.

Once constructed, the Johnson Space Center NSSC nomination stated that the NSSC would not cause any wind or water erosion of soils since no areas of exposed soil would be exposed. The entire site would consist either of impervious surfaces or landscaping. Topography and ground

surface relief features would not be changed substantially, and regional or local drainage patterns would not be altered. Although NASA Johnson Space Center has not conducted a contamination investigation at the site of the proposed NSSC, NASA does not anticipate contamination. NASA would require a confirmatory Level 1 Site Assessment as a condition of a contract or lease, and, depending on findings, may require development and implementation of a remediation plan.

3.2.7 Biological Resources

3.2.7.1 Affected Environment

The site of the proposed NSSC is currently an open grassed area with some vegetation. Vegetation consists of some Chinese tallow trees (*Sapium sebiferum*), hackberry (*Celtis laevigata*), and a coastal tall grass prairie. Coastal prairie grasses, such as little bluestem (*Schizachyrium scoparium*), big bluestem (*Andropogon gerardii*), switchgrass (*Panicum virgatum*), and Indian grass (*Sorghastrum nutans*) dominate the area.

The Johnson Space Center NSSC nomination indicates no threatened or endangered species, or critical habitat occurs at the site. Migratory birds, such as the great egret (*Ardea alba*), are known to occur at Johnson Space Center.³⁷

3.2.7.2 Environmental Consequences

Construction of the NSSC would require clearing of grassland and some trees. The Johnson Space Center NSSC nomination states that development of the NSSC would not impact threatened or endangered species, or critical habitat. To avoid impacting migratory birds, pre- and post-construction surveys would be conducted and construction would be scheduled to avoid periods when the site is being used by migratory birds. To protect migratory birds once the NSSC has been constructed, employees and contracting personnel would be informed about migratory birds and the laws protecting them. At this site, if threatened or endangered species or other protected species are discovered, or candidate species become listed as threatened or endangered, NASA would consult with the U.S. Fish and Wildlife Service in accordance with applicable statutes and regulations.

NASA would take all available steps to prevent introduction of non-native or inappropriate vegetation species that may invade and degrade surrounding habitat for native vegetation species. Landscape maintenance activities would be carefully monitored using the facilities' EMS to ensure that the existing vegetation and the natural community composition and structure would not be degraded. Impacts to the area would be avoided or minimized by facility design and siting to maintain as much existing native vegetation as possible.

³⁷ Ibid.

3.2.8 Ecological Resources

3.2.8.1 Affected Environment

The Johnson Space Center NSSC nomination indicated wetlands or areas of standing water may occur.³⁸ Three wetlands are located at the Johnson Space Center, with a total area less than 200 m² (0.5 ac). The first wetland, in the northwest, is an isolated depression in open grassland. The second wetland, on the western side of the Energy Systems Test Area, is a group of several depressions in open grassland; its boundary is not distinct. Both are seasonal wetlands, wet for only part of the growing season. The third wetland is on the east side of Johnson Space Center, next to the Houston Lighting and Power cooling water canal. It is a brackish marsh fringing a constructed drainage ditch just upstream of the mouth of the ditch at the canal that is subject to tidal flows from the canal. These wetlands are in undeveloped areas, and current NASA operations do not affect them.³⁹

3.2.8.2 Environmental Consequences

The proposed NSSC site appears to be remote from any identified wetlands on Johnson Space Center and therefore environmental consequences to wetlands are not anticipated.

3.2.9 Cultural and Historic Resources

3.2.9.1 Affected Environment

The Apollo Mission Control Room; Space Environment Simulation Lab Chambers A and B; and the Saturn V Rocket are existing National Historic Landmarks at Johnson Space Center.⁴⁰ The Johnson Space Center NSSC nomination states that no known cultural or historic resources are located at the site of the proposed NSSC.

3.2.9.2 Environmental Consequences

Based on NASA's preliminary discussions with the Texas State Historic Preservation Office (SHPO), construction of the NSSC would not have any adverse impacts on the existing National Historic Landmarks at Johnson Space Center. NASA may be required to conduct confirmatory test borings prior to construction, and if archeological resources are indicated, to consult with the Texas SHPO. Mitigation may be required. If unanticipated discovery occurs during construction, NASA would require that construction cease and would consult with the Texas SHPO if mitigation is required, and if so, to develop a mitigation plan.

³⁸ Cited in the Johnson Space Center nomination - refer to the updated 2003 Johnson Space Center ERD Chapter 9 for more details on the small, isolated wetlands identified on Johnson Space Center property, including a map.

³⁹ Brown and Root, 2001.

⁴⁰ Ibid.

3.2.10 Environmental Justice

3.2.10.1 Affected Environment

Workforce diversity, local transportation access by other NASA Centers, and safe and healthful working conditions are criteria considered in each nomination. Each nomination considered opportunities for further employee development in the vicinity of the proposed NSSC and opportunities for partnering with local educational institutions, including minority institutions.

NASA Johnson Space Center did not identify any low-income or minority populations in the surrounding area when the last assessment was conducted in 1996.

3.2.10.2 Environmental Consequences

The Johnson Space Center NSSC states that development of the NSSC would not have disproportionately high and adverse human health or environmental effects on minority or low-income populations or children. Suitable access and facilities would be provided for staff and visitors with handicapping conditions.

Using LandView 6 (2004) software, a merging of selected databases from the EPA and United States Geological Survey (USGS), and Department of Commerce (DOC) Census Bureau TIGER files from the 2000 Census, NASA assessed socioeconomic and other relevant environmental justice factors within a 16 km (10 mi) and 80 km (50 mi) radius of Johnson Space Center. This radius defined the area from which the NSSC labor pool could be drawn.

Figure 3-1 shows that very few tracts within 16 km (10 mi) of the NSSC site have sizeable percentages of minority populations, but several such census tracts are located within an 80 km (50 mi) commute.

Figure 3-2 shows a well-diversified labor pool, both educationally and economically, from which skilled and unskilled workers may be drawn.

Figure 3-3 shows that low-income households would likely to benefit rather than be adversely affected, by the economic and educational opportunities offered by the NSSC.

Figure 3-4 shows that the area surrounding the NSSC within an 80 km (50 mi) radius is fairly congested, but most census tracts have a projected commute shorter than 30 minutes to Johnson Space Center. This figure indicates that mobility and access to work would not be a major concern, and no population segment would be disproportionately affected.

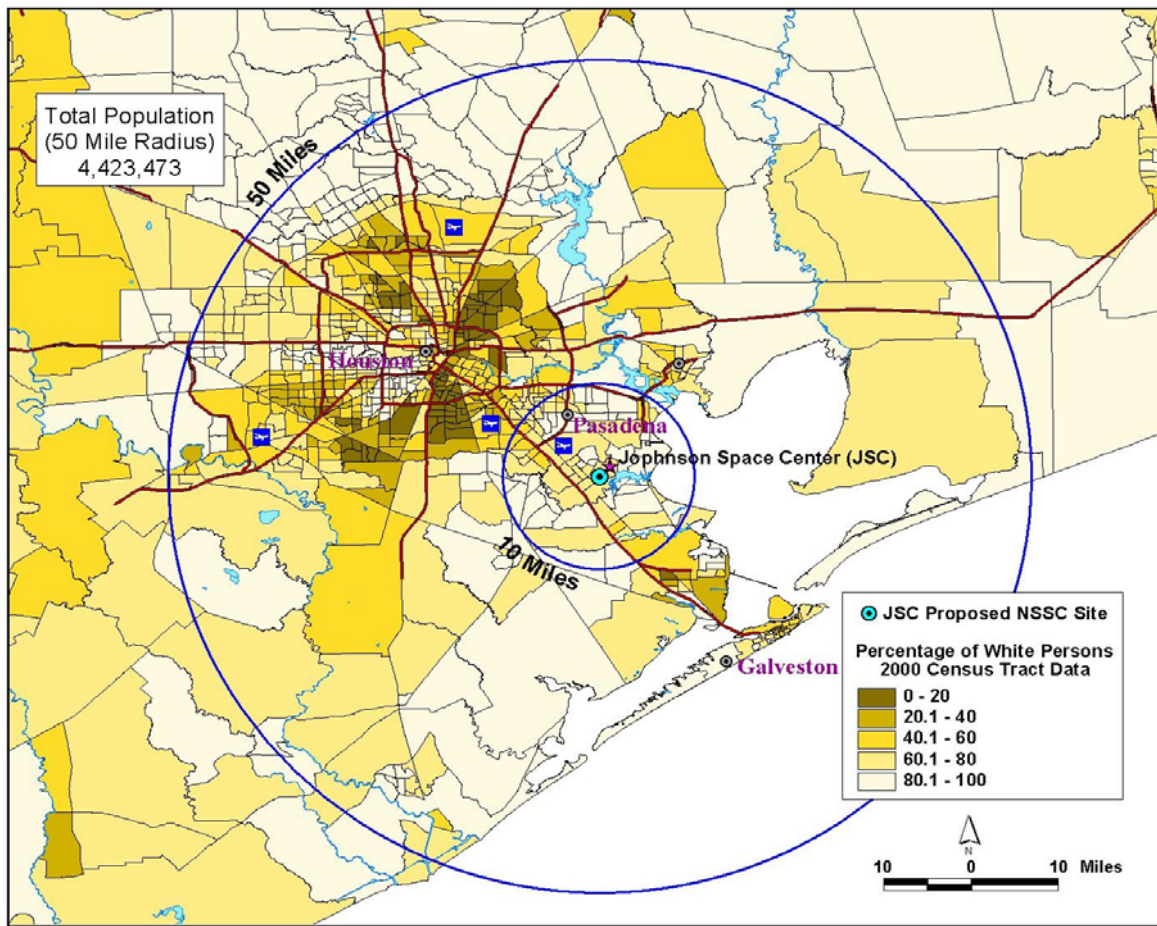


Figure 3-1. NASA Johnson Space Center (A.2.1) 2000 Census Data - Percentage of White Persons

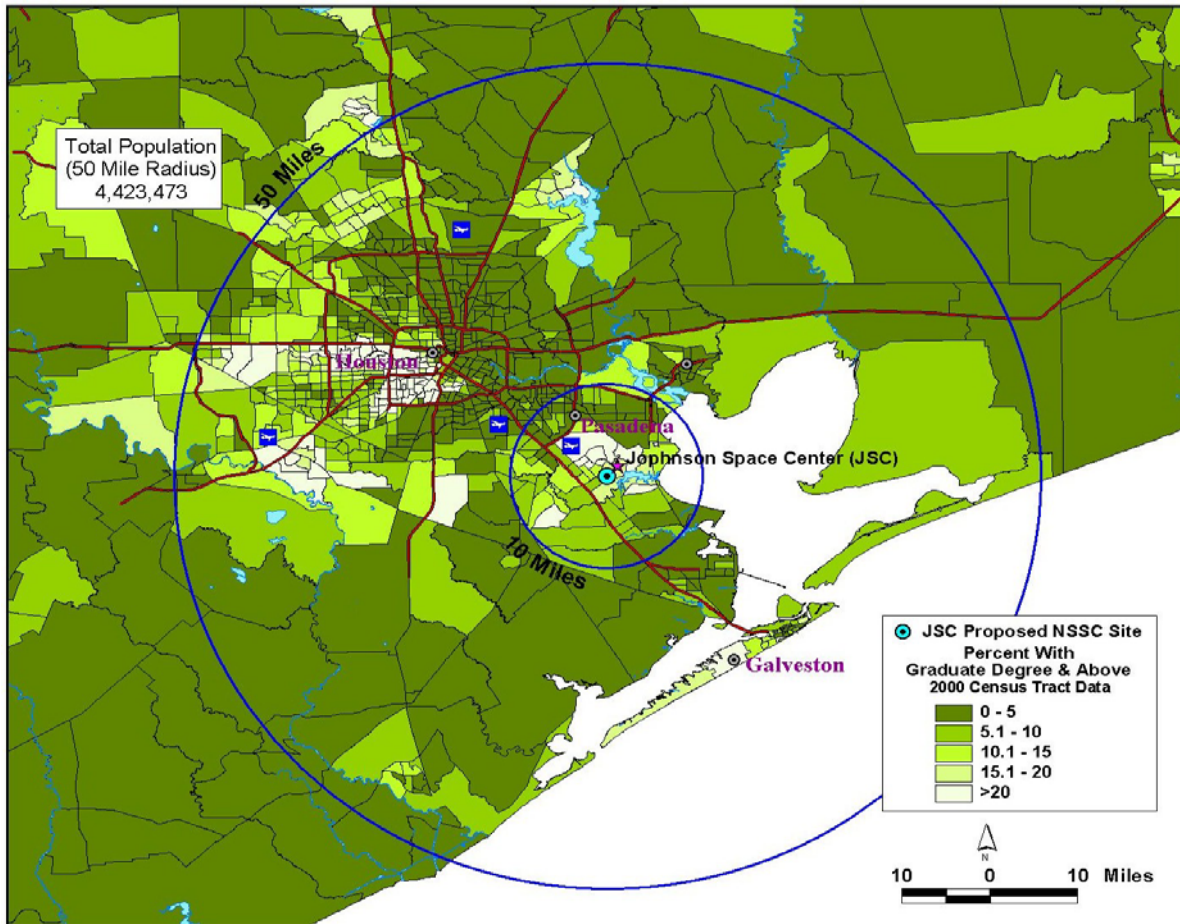


Figure 3-2. NASA Johnson Space Center (A.2.1) 2000 Census Data - Percent with Graduate Degree and Above

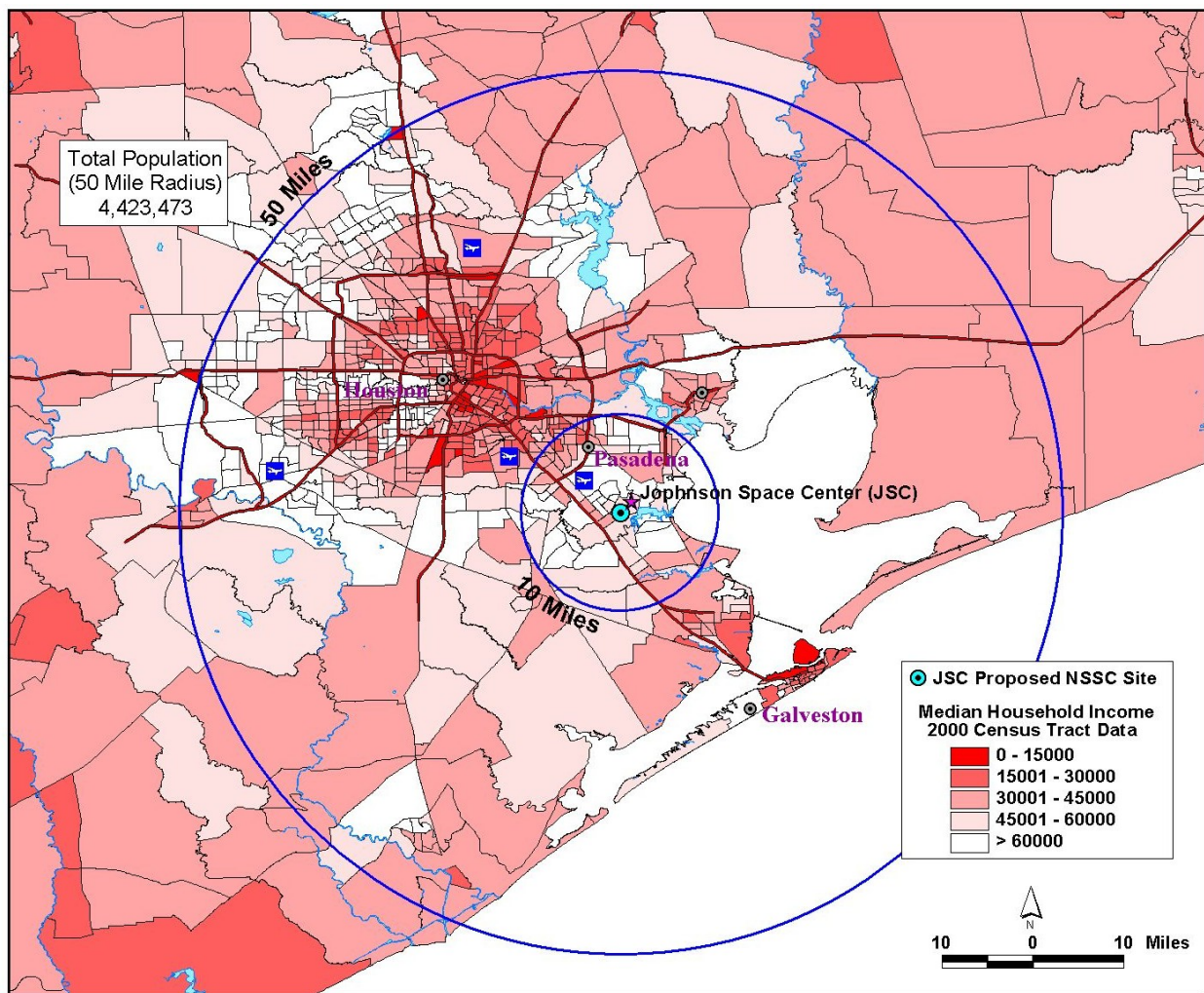


Figure 3-3. NASA Johnson Space Center (A.2.1) 2000 Census Data - Median Household Income

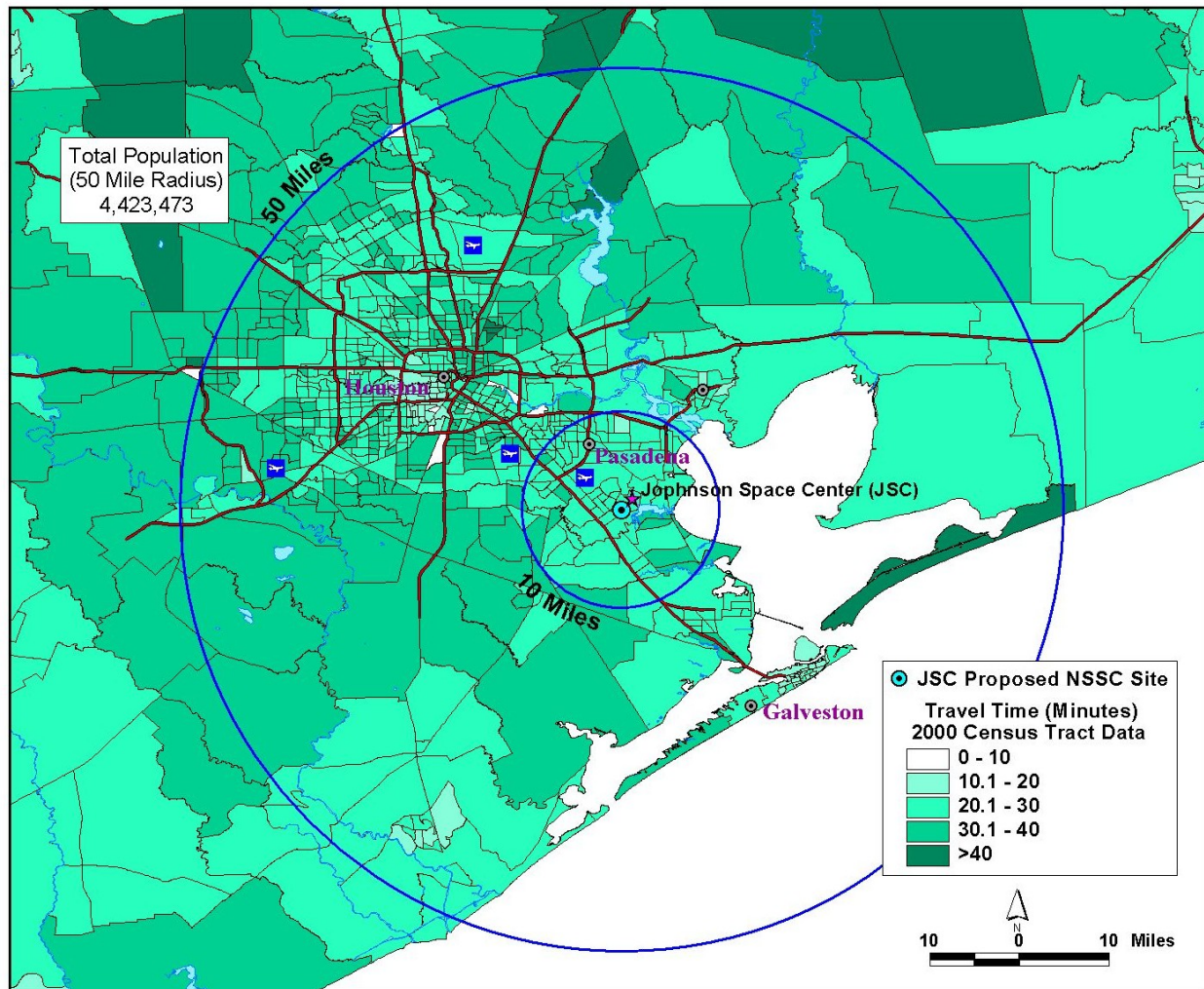


Figure 3-4. NASA Johnson Space Center (A.2.1) 2000 Census Data - Travel Time in Minutes

3.3 ALTERNATIVE A.2.2 NSSC ON-SITE AT NASA STENNIS SPACE CENTER

3.3.1 Facilities and Infrastructure

3.3.1.1 Transportation and Traffic

3.3.1.1.1 Affected Environment

Interstates 10 and 59, U.S. Highway 90, and Mississippi Highway 607 serve the NASA Stennis Space Center (SSC) area. Mississippi Highway 607 provides direct access from Interstates 10 and 59 to and through Stennis Space Center. Highway 607 also connects with U.S. Highway 90 approximately 13.5 km (9 mi) southeast of Stennis Space Center⁴¹. Roadways leading from Mississippi Highway 607 access the site.

Two airports, Gulfport-Biloxi International Airport located in Gulfport, Mississippi, and the Louis B. Armstrong International Airport in New Orleans, Louisiana, provide nationwide access to the site. Commuter air services are proposed to accommodate personnel directly between Stennis Space Center and the NSSC site to Washington D.C. Local access to Stennis Space Center and the proposed NSSC site averages less than 48 km (30 mi) with a commuting time of less than 35 minutes. Due to the location of Stennis Space Center, employees travel in the reverse direction of normal business commuting traffic. Stennis Space Center commuters experience few commuting congestion delays and no lost time.

The site of the proposed NSSC, currently a 375-car parking lot, would accept the NSSC building footprint and still retain approximately 186 parking spaces. A new paved parking area would be constructed on the site to provide the remaining balance of parking required by the NSSC. If the NSSC expands in the future, adequate space would be available for expansion of the parking area.

3.3.1.1.2 Environmental Consequences

The Stennis Space Center NSSC nomination states that Paragon Systems, the Stennis Space Center security contractor, predicts that the addition of 500 vehicles per day as a result of operation of the NSSC would not significantly impact the traffic flow into or out of the Stennis Space Center.

Depending on the circumstances, NASA may develop a transportation management plan with mitigation measures, such as management of construction traffic, and adopting incentives for limiting parking, flexible work schedules, telecommuting, using public transportation, using alternative fueled vehicles, carpooling, and encouraging alternative modes of transportation.

⁴¹ NASA First Response Facility Environmental Assessment, 2003

3.3.1.2 Solid and Hazardous Waste Generation and Management

3.3.1.2.1 Affected Environment

NASA Stennis Space Center generates solid and hazardous waste from its research and development operations, laboratories, instrument repair operations, facility operations, and maintenance functions. The solid waste generated consists of household-type wastes and non-hazardous industrial waste. Solid waste is disposed of onsite in a State-permitted solid waste landfill. Hazardous waste is transported off-site for treatment, storage, or disposal as appropriate. NASA maintains Large Quantity Generator status under the Resource Conservation and Recovery Act, subtitle C for generating hazardous waste, and transporting it off-site.⁴²

Stennis Space Center is committed to pollution prevention, including recycling and reuse activities to achieve waste minimization goals. Stennis Space Center maintains ongoing recycling programs and identifies less hazardous substitutes for hazardous materials used in its operations.

The proposed NSSC site has been a parking lot since 1987 and was not identified during the extensive record searches or interviews as a potentially contaminated site.

3.3.1.2.2 Environmental Consequences

The NSSC would generate the types of solid waste and recyclable wastes that are already generated by existing office facilities at the Stennis Space Center. The NSSC would be constructed and operated in a way that reduces waste generation, and encourages recycling and reuse of materials. A designated area would store recyclables. Existing waste management and recycling companies would provide the NSSC with collection and disposal services for solid waste and recyclable materials. No major change in the level of current waste and recyclable materials collection services at the Stennis Space Center would be required.

According to the Stennis Space Center NSSC nomination, neither construction nor operation of the NSSC would store, generate or require the disposal of any hazardous or radioactive materials or wastes. In addition, pesticide usage would be managed according to the Stennis Space Center Integrated Pest Management Program. If the NSSC were to use hazardous materials, such as paints and solvents, or to produce hazardous wastes as part of the construction activities, the management of these materials would be the responsibility of the developer, who would be required to follow normal management practices as required by State and local agencies.

⁴² NASA First Response Facility Environmental Assessment, 2003

3.3.1.3 Public Services and Utilities

3.3.1.3.1 Affected Environment

Power, natural gas, potable water and sewage treatment are currently available at the Stennis Space Center, including the area adjacent to the site of the proposed NSSC. Public services fire, police, and security are also currently available at the Stennis Space Center.

Mississippi Power currently provides power to the Stennis Space Center and would also provide power to the NSSC. While power interruptions are infrequent, an emergency generator would be located at the NSSC. Stennis Space Center would control the water and sewer systems to the NSSC, and multiple water towers would allow for uninterrupted servicing. These utilities would need to be extended into the site of the proposed NSSC, and would be designed to accommodate future expansion of the NSSC.

3.3.1.3.2 Environmental Consequences

Providing power, natural gas, potable water and sewage service to the NSSC would not adversely impact local utility companies since Stennis Space Center has its own utility infrastructure. The Stennis Space Center NSSC nomination stated that new electricity, natural gas, water and sewer service lines need to be installed and that installation would avoid or minimize environmental impacts. The NSSC would be subject to Federal energy reduction and water conservation goals established in the National Energy Conservation Policy Act, E.O. 13123, and other laws. The NSSC's energy and water conservation requirements would be incorporated into existing Stennis Space Center programs, and managed by the Stennis Space Center Energy and Water Conservation Program Manager. Stennis Space Center periodically upgrades its utilities infrastructure to ensure system availability and reliability. NASA would also designate a part- or full-time NASA NSSC Energy Manager.

Public services such as fire, police, and security response are currently available at Stennis Space Center and would be expanded to include protection of the NSSC. This could easily occur without impacting the level of protection currently provided to the Stennis Space Center.

3.3.1.4 Communication

3.3.1.4.1 Affected Environment

The Stennis Data Center provides existing communications and IT infrastructure at NASA Stennis Space Center and routinely conducts technology upgrades. The digital telephone switch system is less than two years old and very reliable. The data service cables provide high speed archival and retrieval of data and are very reliable.

3.3.1.4.2 Environmental Consequences

The existing communications and IT infrastructure at the Stennis Data Center would adequately meet all aspects of the NSSC's technology and communications requirements. The Stennis Space Center NSSC nomination stated that new communication lines would need to be installed and connected to the NSSC. This would occur with no or minimal impact to the environment. An existing NASA contract for computer and telephone equipment would provide equipment.

3.3.2 Land Use

3.3.2.1 Affected Environment

The Stennis Space Center is a Federal City located in a rural area within the meaning of the Rural Development Act. The Stennis Space Center is used by NASA for rocket propulsion testing and is also used by other agencies to conduct laboratory and industrial operations. Services such as banks, service stations, higher education centers and recreation areas are also located at Stennis Space Center. A 50,000 ha (125,001 ac) acoustic buffer zone surrounds the Stennis Space Center. This buffer zone includes portions of the Pearl River State Wildlife Management Area and the Bogue Chitto National Wildlife Refuge. The proposed NSSC site is currently used for parking.

3.3.2.2 Environmental Consequences

Part of the NSSC site would continue to be used for parking and the remainder would house the NSSC building. Use of the site for the NSSC is consistent with the uses already present at the NASA Stennis Space Center.

3.3.3 Noise

3.3.3.1 Affected Environment

NASA Stennis Space Center is surrounded by a 50,000 ha (125,001 ac) acoustic Buffer Zone that minimizes the impact of the noise and vibration generated by static rocket and engine testing. The boundaries of the acoustic Buffer Zone are intended to protect human health and the environment and are based on maximum predicted sound levels.

The majority of the Buffer Zone is located in Hancock County, Mississippi, although portions extend into Pearl River County, Mississippi and St. Tammany Parish, Louisiana. Several communities are situated just outside the Buffer Zone including Pearlington, Waveland, Bay St. Louis, Kiln, and Picayune, Mississippi, and Slidell and Pearl River, Louisiana.⁴³

⁴³ SSC ERD, April 2003

The acoustic Buffer Zone is uninhabited and consists of mostly forests and pasturelands. Farming, lumbering, grazing and mineral operations are permitted in the buffer zone area.⁴⁴

NASA Stennis Space Center daily noise levels are due to landscape and building maintenance, boilers, cooling towers, and traffic.

3.3.3.2 Environmental Consequences

Noise from construction activities associated with the NSSC would have a short-term and intermittent impact. No State or local noise ordinances apply to operations at the Stennis Space Center. The NSSC would not affect noise levels at Stennis Space Center.

3.3.4 Air Quality

3.3.4.1 Affected Environment

NASA Stennis Space Center is considered to be in a rural area for air quality. The ambient air quality of the three southern Mississippi counties (Hancock, Harrison and Jackson) is considered to be in attainment for particulate matter (PM)-10, ozone, carbon monoxide, sulfur dioxide, nitrogen oxides, and lead.

Air emissions at NASA Stennis Space Center are associated with rocket testing, diesel fuel burning equipment (generators and engines), fuel dispensing operations, HCFC usage and recovery process, abrasive blast operations, and flare stacks. All significant NASA Stennis Space Center air pollution sources are listed in the Title V Operating Permit. NASA Stennis Space Center emissions are in compliance with Federal and State emissions regulations.

3.3.4.2 Environmental Consequences

The NSSC would not have an adverse impact on air quality during construction and operation of the NSSC or cause emissions to exceed regulatory or permit limits.

3.3.5 Water Resources

3.3.5.1 Affected Environment

NASA Stennis Space Center maintains a National Pollutant Discharge Elimination System (NPDES) permit for the discharge of wastewaters that leave Stennis Space Center outfalls. Stennis Space Center currently has five outfalls: four that come from the natural, biological wastewater/sewage treatment systems and one for the Stennis Space Center Access Canal rocket test deluge water.

⁴⁴ http://www.ssc.nasa.gov/environmental/resource_mngmnt/noise_mngmnt/noise.html

Stormwater runoff in the industrial areas of Stennis Space Center is inspected annually to evaluate the effectiveness of the Stormwater Pollution Prevention Plan implemented by the Stennis Space Center NPDES permit. Most surface run-off from Stennis Space Center drains into the Pearl River. The river is voluntarily monitored.

Groundwater at the Stennis Space Center is soft, containing sodium bicarbonate and exhibiting a high pH (above 8). Concentrations of chlorides range from 13 to 16 parts per million (ppm) and iron content is less than 0.3 ppm. Solids content does not exceed 315 ppm. The aquifers have plentiful, almost untapped supplies of fresh water. Potable water at Stennis Space Center is supplied from three deep wells on site. This water is used for drinking, sanitation and fire protection⁴⁵.

The Stennis Space Center NSSC nomination stated that the site of the NSSC does not contain a waterbody or have a waterbody within direct access of the site.

The Mississippi Department of Environmental Quality requires stormwater permits and stormwater pollution prevention plans for all construction sites greater than 0.4 ha (1 ac). Stennis Space Center currently has two Mississippi Construction Stormwater General NPDES Permits for two active construction sites. Both sites are inspected weekly for conformance with the permits' Stormwater Pollution Prevention Plans. Stormwater flow follows unnamed ditches to Mike's River and then to the East Pearl River.

3.3.5.2 Environmental Consequences

Stennis Space Center would obtain or require that a State stormwater permit be obtained prior to construction of the NSSC. During construction of the NSSC, impacts to surface waters in the area would be minimized by ensuring that BMPs are used and maintained to control erosion and sedimentation.

Operation of the NSSC would result in stormwater discharges from impervious surfaces such as parking areas and the roof of the NSSC. The Stennis Space Center NSSC nomination stated that drainage ditches, culverts and stormwater drains would control stormwater.

3.3.6 Soils and Geology

3.3.6.1 Affected Environment

Most of the soils found at the Stennis Space Center contain a considerable amount of water and are considered hydric. Soils most commonly found at the Stennis Space Center include Atmore silt loam, Guyton silt loam, Smithton fine sandy loam, and Escambia loam.

⁴⁵ NASA First Response Facility Environmental Assessment, 2003

In 1990, NASA Stennis Space Center conducted a Preliminary Assessment using prior knowledge of the facility and interviews with Stennis Space Center personnel for 40 areas that were potential areas of environmental releases, spills and disposal incidents, according to the Comprehensive Environmental Response, Compensation and Liability Act, as amended by the Superfund Amendments and Reauthorization Act. Of the 40 areas reviewed, 30 locations were designated for no further action, one required long-term monitoring, seven were designated for clean up, and one is pending a no further action determination. Based on Stennis Space Center knowledge of the proposed site location for the NSSC, no adverse environmental incidents have occurred at that location. The Stennis Space Center NSSC nomination stated that the Stennis Space Center has carried out significant environmental investigations, and no evidence of contamination has been found at the site of the proposed NSSC. The State of Mississippi has concurred with this determination.

3.3.6.2 Environmental Consequences

Construction of the NSSC building and parking lot would disturb approximately 1.6 ha (4 ac). Erosion control measures would be used during construction to prevent wind and water erosion.

Once constructed, the NSSC would not result of wind or water erosion of soils since there would not be any areas of exposed soil. The entire site would consist either of impervious surfaces or landscaping. Topography and ground surface relief features would not be changed substantially, nor would regional and local drainage patterns be altered.

3.3.7 Biological Resources

3.3.7.1 Affected Environment

The Stennis Space Center NSSC nomination states that the Stennis Space Center contains nearly 4,000 ha (10,000 ac) of pristine natural areas. The Stennis Space Center is also surrounded by 50,000 ha (125,001 ac) of undeveloped land (the acoustic buffer), a portion of which is within the Pearl River State Wildlife Management Area and the Bogue Chitto National Wildlife Refuge in Louisiana.

Five federally listed animals and one plant have historically been found in the proximity of the Stennis Space Center; gopher tortoise (*Gopherus polyphemus*), eastern indigo snakes (*Drymarchon corais couperi*), red-cockaded woodpeckers (*Picoides borealis*), American peregrine falcons (*Falco peregrinus*), Louisiana black bear (*Ursus americanus luteolus*), and the Louisiana quillwort (*Isoetes louisianensis*)

The U.S. Fish and Wildlife Service (USFWS) conducted surveys for the gopher tortoise and the eastern indigo snake in 1988, and annually from 1991-1997. The 1994 survey identified one gopher tortoise burrow. 1991 and 1994 surveys for the red-cockaded woodpecker did not identify either the bird or cavity nesting trees. In 1995, Dr. Harry Jacobson and Dr. Bruce

Leopold's survey on the presence of Louisiana black bear at the site did not find any evidence of the bear.⁴⁶

Although the surveys found no listed species within the Fee Area, the buffer was found to have a marginally suitable habitat for several species, e.g., gopher tortoises, eastern indigo snakes, and black bear. The USFWS concurred with Stennis Space Center findings that no listed species currently occur on the Fee Area of Stennis Space Center.⁴⁷

In April of 1998, Stennis Space Center contracted with Dr. Jean Wooten to conduct a comprehensive onsite survey for Louisiana quillwort. She found no evidence of the Louisiana quillwort or any other species of the Isoetes family, and in her opinion, concluded no Louisiana quillwort occurs on Stennis Space Center. The USFWS concurred with that finding.⁴⁸

The majority of the site of the proposed NSSC is a paved parking lot; with open grassed areas making up the rest of the site. No protected plants occur in or near this disturbed area.

3.3.7.2 Environmental Consequences

No impact to threatened or endangered species would occur during construction and operation of the NSSC. It would also be extremely unlikely to find the eastern indigo snake, gopher tortoise, red cockaded woodpecker, or quillwort on, in, or near the proposed NSSC site. NASA would take all available steps to prevent introduction of non-native vegetation species that may invade or degrade surrounding habitat for native vegetation species. Landscape development and maintenance activities would ensure that impacts to the area would be avoided or minimized by using as much existing or native-type vegetation as possible.

A visual survey for Federally listed threatened and endangered species would not need to be conducted prior to any construction of the NSSC. At this site, if threatened or endangered species or other protected species are discovered, or candidate species become listed as threatened or endangered, NASA would consult with the U.S. Fish and Wildlife Service in accordance with the applicable statutes and regulations. If mitigation is required, NASA would develop and implement a mitigation plan.

⁴⁶ U.S. Fish and Wildlife Service (USFWS) 1999

⁴⁷ USFWS February 1999

⁴⁸ USFWS, May 1998

3.3.8 Ecological Resources

3.3.8.1 Wetlands

3.3.8.1.1 Affected Environment

A large portion of both Stennis Space Center and the acoustic Buffer Zone surrounding the Stennis Space Center consists of wetlands. However, according to the Stennis Space Center NSSC nomination, no wetlands or floodplains occur at or are adjacent to the site of the proposed NSSC.

3.3.8.1.2 Environmental Consequences

No impact to wetlands or floodplains would occur during construction and operation of the NSSC.

3.3.9 Cultural and Historic Resources

3.3.9.1 Affected Environment

The three test stands at Stennis Space Center, known as Rocket Propulsion Test Complexes A-1, A-2, and B-1/B-2, are designated National Historic Landmarks and appear on the National Register of Historic Places⁴⁹. All other historic properties at the Stennis Space Center site were relocated or are outside the developed area. Stennis Space Center has an extensive historic preservation program.

3.3.9.2 Environmental Consequences

The proposed NSSC facility would not have any impact on current National Historic Landmarks or any National Register properties.

3.3.10 Environmental Justice

3.3.10.1 Affected Environment

The Stennis Space Center Environmental Justice Implementation Plan identified six Census block groups where environmental justice issues may occur. Indicators selected to identify areas where environmental justice may be of greater concern were median family income, per capita income, ethnicity, percentage of population who are children, and the percentage of population who are female. Four of the Census block groups that indicated vulnerability were located in Picayune, Mississippi, one is located just north of Kiln, Mississippi, and one is located in Pearlington, Mississippi.

⁴⁹ NASA First Response Facility Environmental Assessment, 2003

Workforce diversity, transportation access, and safe and healthful working conditions are criteria considered in each nomination. Each nomination considered opportunities for further employee development in the vicinity of the proposed NSSC and opportunities for partnering with local educational institutions, including minority institutions.

According to the Stennis Space Center NSSC nomination, development of the NSSC would not have disproportionately high and adverse human health or environmental effects on environmental justice populations or the environmental health and safety of children. Suitable access and facilities would be provided for staff and visitors with handicapping conditions.

3.3.10.2 Environmental Consequences

Using LandView 6 (2004) software, merged selected databases from the EPA and USGS, and DOC Census Bureau TIGER files from the 2000 Census, NASA assessed socioeconomic and other relevant environmental justice factors for the Stennis Space Center vicinity within 16 km (10 mi), extending close to Slidell and Picayune, and 80 km (50 mi), including the New Orleans metro area. This radius defined the area from which the NSSC labor pool could be drawn.

Figure 3-5 shows that within 16 km (10 mi) of the NSSC site Census tracts have few minority populations, but within 80 km (50 mi) Census tracts with predominantly non-white populations occur.

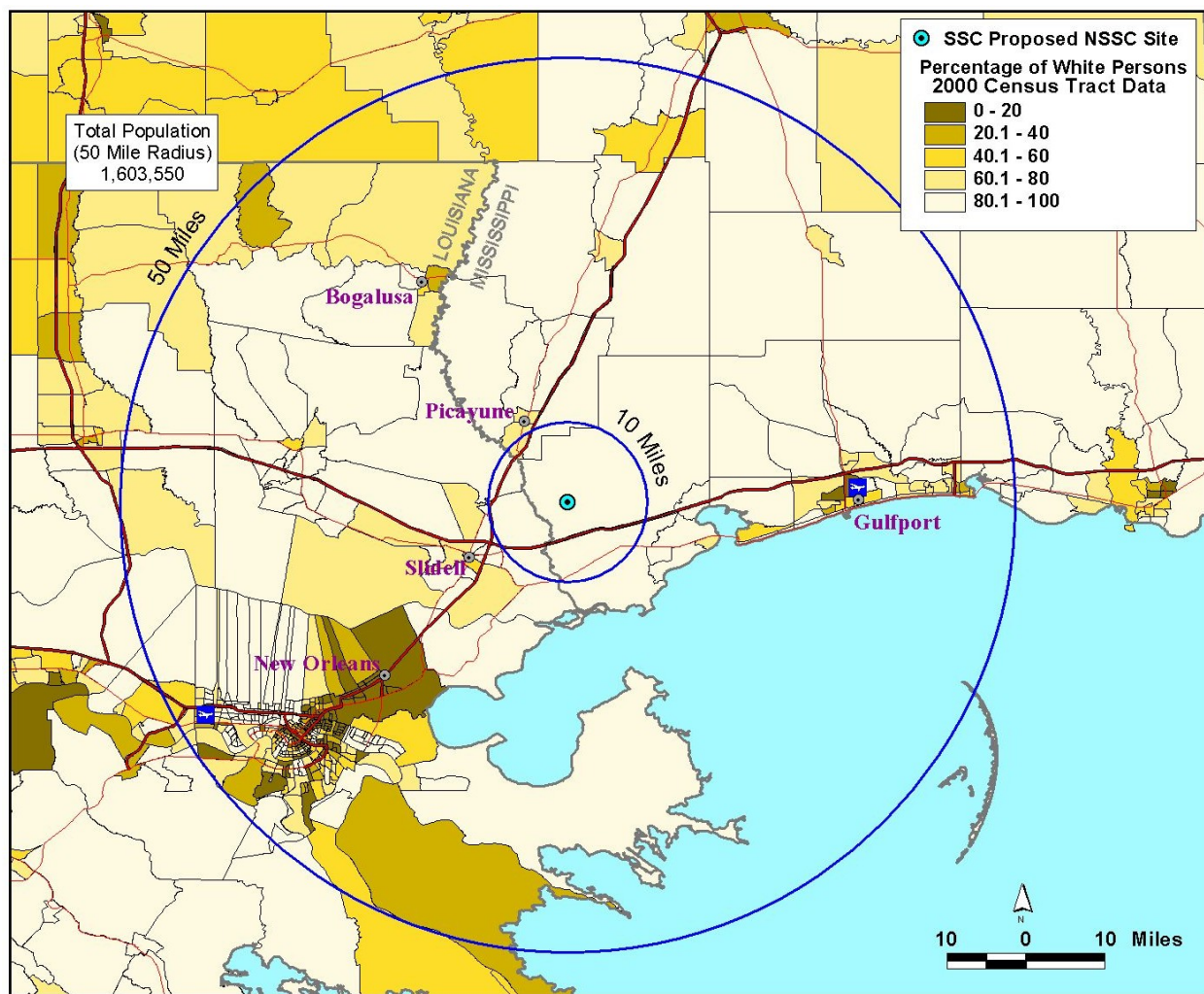


Figure 3-5. NASA Stennis Space Center (A.2.2) 2000 Census Data - Percentage of White Persons

Other relevant socio-economic data to achieving environmental justice goals include the percentage with graduate degrees and above in and median household income. Figure 3-6 shows while less than 10 percent of those within 16 km (10 mi) of the Stennis Space Center hold advanced degrees, few economically disadvantaged people are present since median household income exceeds \$30,000 to \$45,000 (Figure 3-7). However, economically disadvantaged areas occur near Slidell, which are likely to benefit, rather than be adversely affected, by the economic and educational opportunities offered by the proposed NSSC.

Figure 3-8 shows several communities within a 30-minute commute of Stennis Space Center, with few pockets with travel times greater than 40 minutes. The entire area surrounding the

proposed NSSC would be accessible to prospective workers, so issues of mobility and access to work would not be a major concern, and no population segments would be unduly impacted.

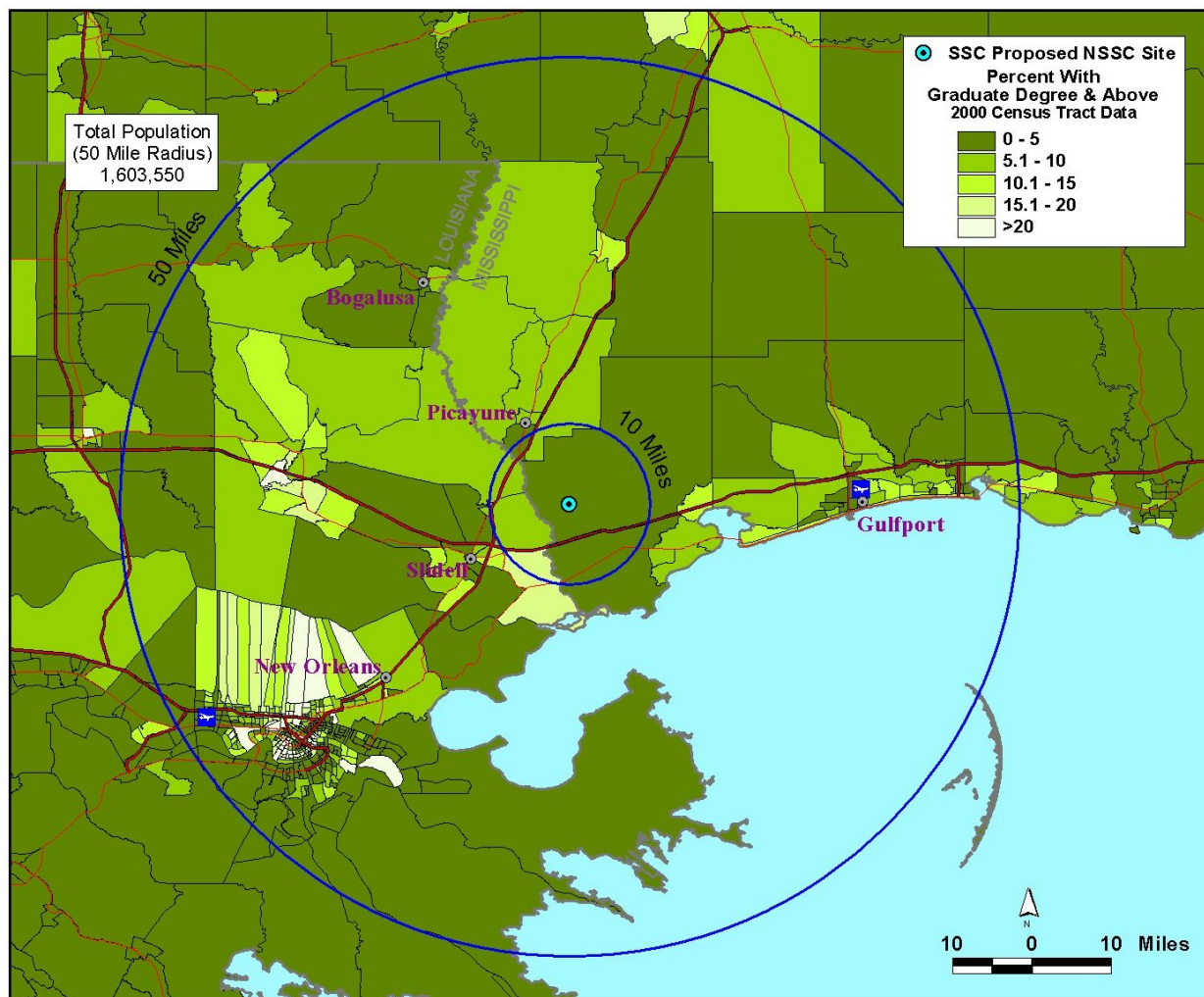


Figure 3-6. NASA Stennis Space Center (A.2.2) 2000 Census Data - Percent with Graduate Degree and Above

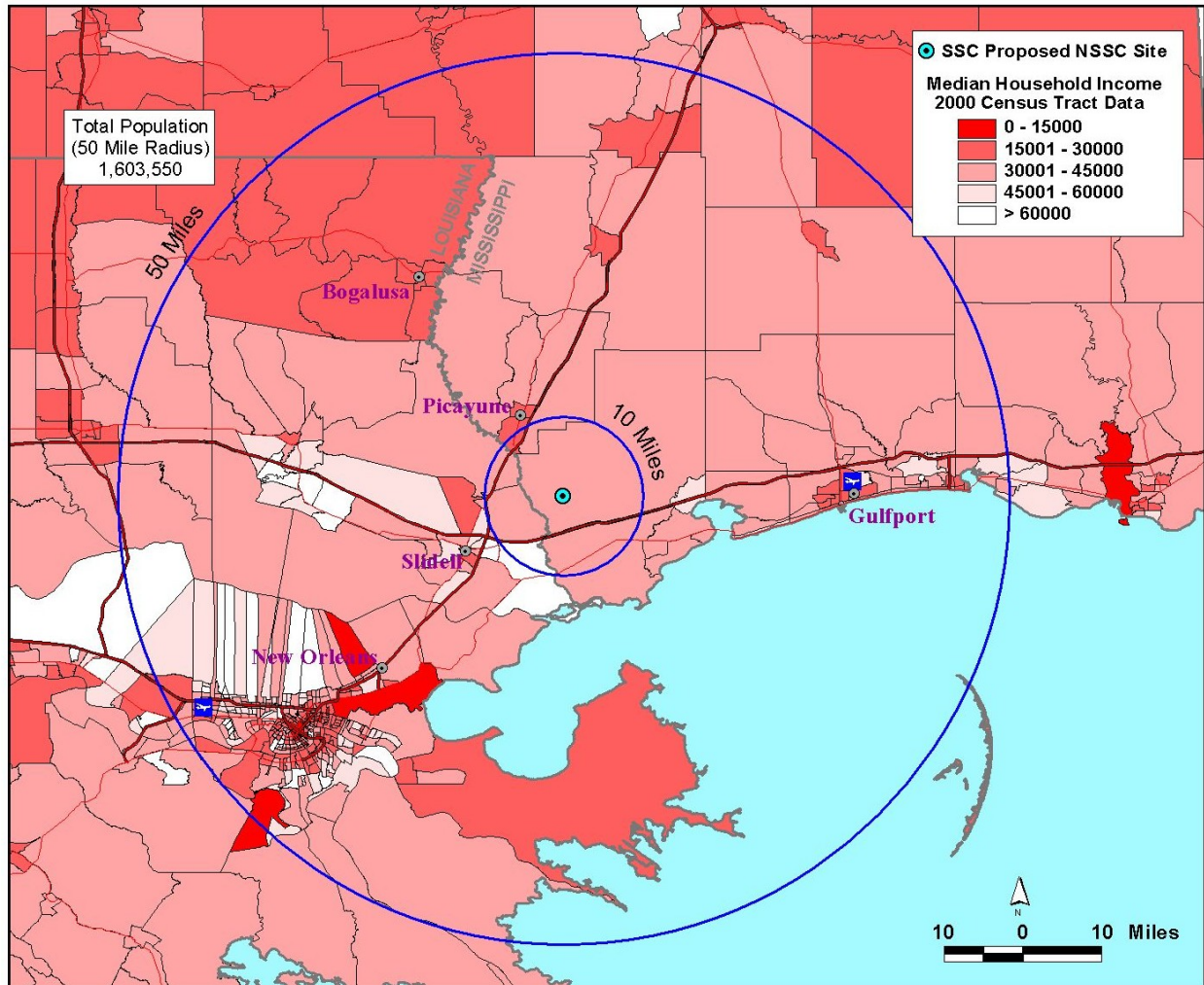


Figure 3-7. NASA Stennis Space Center (A.2.2) 2000 Census Data - Median Household Income

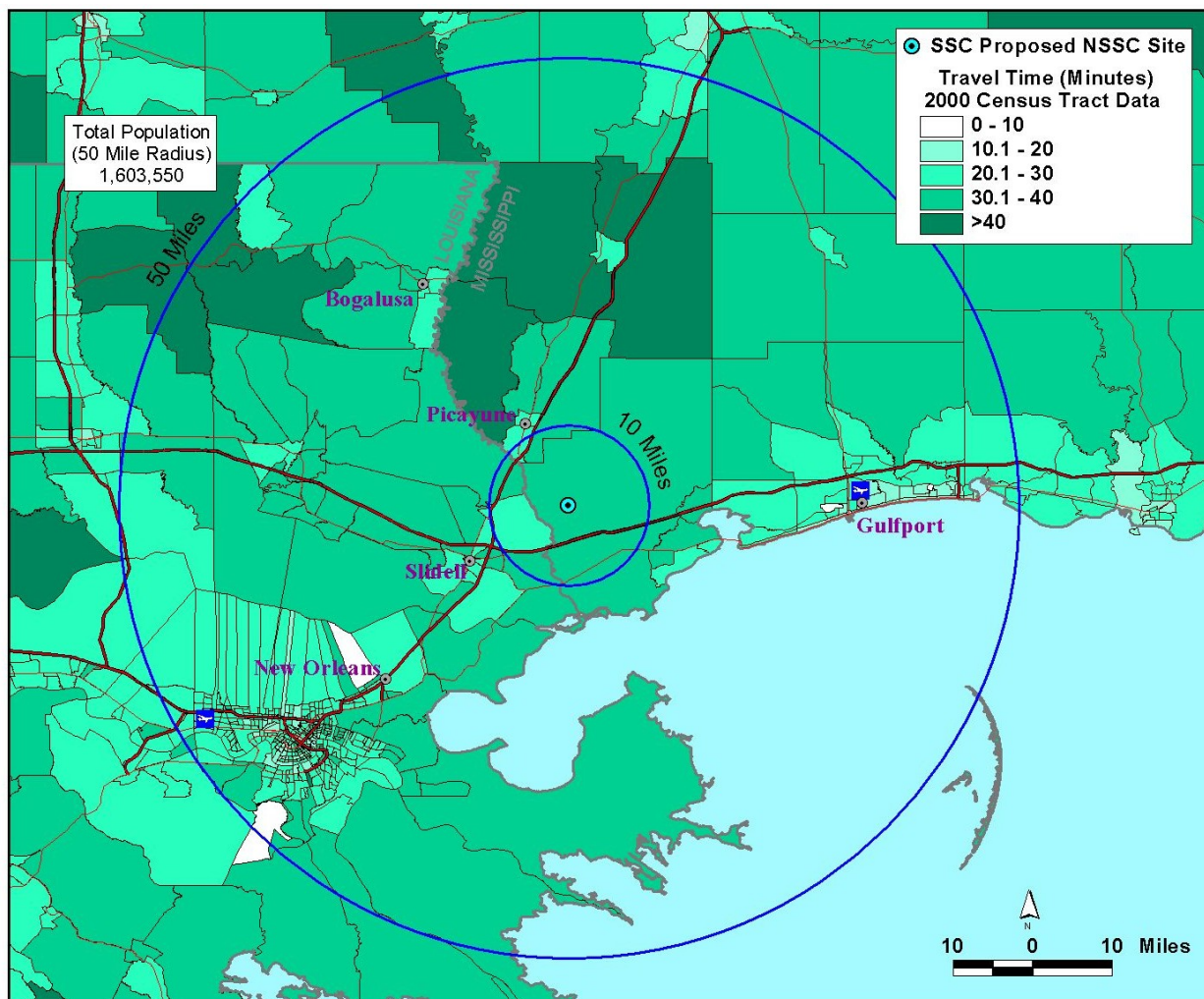


Figure 3-8. NASA Stennis Space Center (A.2.2) 2000 Census Data - Travel Time in Minutes

Development of the proposed NSSC would not have disproportionately high and adverse human health or environmental effects on environmental justice populations or children. Suitable access and facilities would be provided for staff and visitors with handicapping conditions. Stennis Space Center considers environmental justice issues during program and project planning consistent with the Stennis Space Center Environmental Justice Strategy. Any disproportionately high and adverse effects of proposed programs at Stennis Space Center on minority or low-income populations would be identified and action would be taken to resolve

public concern.⁵⁰ The NSSC would develop an environmental justice strategy or apply the Stennis Space Center Environmental Justice Strategy.

3.4 ALTERNATIVE A.4.1 NSSC OFF-SITE AT AEROSPACE TECHNOLOGY PARK

3.4.1 Facilities and Infrastructure

3.4.1.1 Transportation and Traffic

3.4.1.1.1 Affected Environment

According to the Glenn Research Center NSSC nomination, road and utility infrastructure for the proposed facility exists. Parking capacity at the proposed NSSC site on Parcel Q in Aerospace Technology Park would be approximately 800 parking spaces. Space would be available for further parking expansion in the future, up to 1.5 times the current planned parking space. Access to the site would be from Aerospace Parkway, which was recently improved in response to expansion of the adjacent Cleveland – Hopkins International Airport. Aerospace Parkway easily connects to Interstates 71 and 840 and local secondary roads.

3.4.1.1.2 Environmental Consequences

The Glenn Research Center NSSC nomination stated that traffic would increase due to job creation but local transportation would be minimally impacted. The City of Brook Park completed the Aerospace Technology Parkway in 2003, which would mitigate any issues associated with increases in traffic.

3.4.1.2 Solid and Hazardous Waste Generation and Management

3.4.1.2.1 Affected Environment

The Glenn Research Center-Lewis Field currently generates solid waste and recyclable materials such as paper and plastics, which are collected by local waste management and recycling for appropriate disposal or treatment. The proposed NSSC site located off-site from Glenn Research Center-Lewis Field does not currently generate solid or hazardous waste.

3.4.1.2.2 Environmental Consequences

The Glenn Research Center NSSC nomination stated that the NSCC would not generate hazardous, toxic, or radiological waste.

⁵⁰ SSC, NASA First Response Facility Environmental Assessment, 2003

The proposed NSSC would generate the same types of solid waste and recyclable wastes that are already generated by existing office facilities at the Glenn Research Center-Lewis Field. The proposed NSSC would be constructed and operated in such a way to reduce waste and encourage recycling and reuse of materials. Existing waste management and recycling companies would provide collection and disposal services for these types of materials. No major change in the level of current waste and recyclable materials collection services would be required.

The developer would be responsible for managing hazardous materials, such as paints and solvents, used during construction, and hazardous wastes generated as a result of the construction activities, following normal management practices as required by State and local agencies.

3.4.1.3 Public Services and Utilities

3.4.1.3.1 Affected Environment

Local utility companies currently provide power, natural gas, potable water and sewage treatment to the Glenn Research Center-Lewis Field. Public services such as fire, ambulance, and security are currently available at Glenn Research Center-Lewis Field. Such services would extend to the proposed NSSC or be provided by the City of Brook Park.

An under floor distribution system would provide heating, cooling and ventilation in the proposed NSSC building. In addition to achieving better airflow patterns, this design would control conditions in the individual workspaces. System controls would be wireless to eliminate material for wiring and conduit. The controls would be digital, electronic and linked to the maintenance and space management systems. Rotating equipment would have energy saving variable speed drives with appropriate electrical isolation. This system would ensure excellent indoor air quality through ample ventilation and monitoring for carbon dioxide content. The piping system design would convey heating and cooling fluids and serve as fire suppression systems, thereby reducing the amount of piping in the building.

The plumbing system design would conserve and avoid excessive water and sewer use, and include waterless suction fixtures, low flow fixtures, and systems to recycle wastewater.

A substation is located on Ruple Road at the southwest corner of Parcel Q. A 138 kV powerline runs from the substation and to the south of Parcel Q to Aerospace Parkway, then follows Aerospace Parkway as it turns to the northeast and runs along the edge of Parcel Q. The powerline is underground and does not cross Parcel Q.

No other significant sources of electromagnetic fields or electromagnetic radiation exist in the vicinity of the proposed NSSC site.

3.4.1.3.2 Environmental Consequences

The Glenn Research Center NSSC nomination stated that the proposed NSSC would have minimal impact on local utilities. Utilities such as sewer piping would be modified to

accommodate the new facility and parking lot. The construction of the Aerospace Technology Parkway included improvements to sewer and water mains. The new facility would use additional power. The City of Brook Park would obtain any required permits.

The NSSC would be subject to Federal energy reduction and water conservation goals established in the National Energy Conservation Policy Act and E.O. 13123. NASA would designate a part- or full-time NASA NSSC Energy Manager. Utilities would be installed or modified in a manner that would avoid or minimize environmental impact.

3.4.1.4 Communication

3.4.1.4.1 Affected Environment

Communication services, including but not limited to conventional telephone service, internet service, and other data transmission services, are available at the Glenn Research Center-Lewis Field but not at the site of the proposed NSSC, where local companies provide these services.

3.4.1.4.2 Environmental Consequences

Communication services would need to be extended to the NSSC. An existing NASA contract for computer and telephone equipment would provide equipment. Impact to the environment would be minimal.

3.4.2 Land Use

3.4.2.1 Affected Environment

The proposed NSSC would be located off-site of Glenn Research Center-Lewis Field in the Aerospace Technology Park in the City of Brook Park. The site is currently wooded, with no history of industrial use. All structures in this area must conform to Federal Aviation Administration restrictions due to proximity to the Cleveland-Hopkins International Airport. The recreational facilities in the West area of Glenn Research Center and the Cleveland Metroparks Rocky River Nature Center and Reservation that are in close proximity to the proposed NSSC site provide abundant recreational space.

The City of Cleveland has been expanding the Cleveland-Hopkins International Airport. This expansion has required the use of portions of the NASA South Area for additional and extended runways. This tract included the Rocket Engine Test Facility (Building 202), the Cryogenic Components Laboratory (Building 203), the High-Load Tensile Test Facility (Building 204), the Central Chemical Storage Facility (Building 212), and other structures, which have been removed and relocated.⁵¹

⁵¹ GRC Environmental Resource Document (ERD), 2003

The surrounding area also contains several industrial complexes, business districts, highways, and a residential area of moderate density (two to six dwellings per acre). The area is highly urbanized and developed. Strict safety precautions are maintained to protect the public health and safety. The nearby Rocky River Nature Center and Reservation is a protected environment and includes the entire course of the Rocky River from Glenn Research Center-Lewis Field to Lake Erie.⁵²

3.4.2.2 Environmental Consequences

The Glenn Research Center NSSC nomination stated that the wooded site would be minimally disturbed through an efficient building layout and footprint. The Brook Park Development Plan Report (1999) shows that the adopted site development master plan will preserve green parkland and wooded areas, such as the Abram Creek Recreation Area, to preserve environmental quality and balance the expanded commercial land uses.

3.4.3 Noise

3.4.3.1 Affected Environment

Some communities adjacent to Glenn Research Center-Lewis Field have local noise ordinances. These ordinances are generally in the form of zoning restrictions for noise levels at residences and commercial facilities and for the operation of noise-emitting devices during certain times of the day. Several noise sources exist in the general vicinity of the proposed NSSC site. Foremost is the Cleveland-Hopkins International Airport, which is adjacent to Lewis Field and the proposed NSSC site. Other lesser noise sources occurring nearby include a Ford Motor Company factory, two major Interstate highways, and a large exhibition hall.⁵³

Noise is generated at Glenn Research Center-Lewis Field from such sources as research operations (e.g., wind tunnels and engine test cells), transient noises, such as releases from valves, NASA aircraft, construction activities, and traffic noise. Recent surveys indicate that, with the exception of transient noise spikes, the highest on-lab noise levels measured near operating systems are in the 90-95 dB(A) range, with a maximum of 102 dB(A). Transient peaks in noise levels may occur due to the action of relief valves, vent noise, etc. Aircraft housed in the Flight Research Building (Building 4, the hangar) can taxi directly to runways at Cleveland-Hopkins International Airport. Aircraft operations can generate maximum environmental noise levels between 80 and 90 dB(A) in nearby pedestrian areas on the Lewis Field. Construction generates noise from machinery and vehicular traffic.⁵⁴ During construction of the NSSC similar noise levels may temporarily be reached or exceeded.

⁵² Ibid

⁵³ Ibid

⁵⁴ Ibid

The general noise level of Glenn Research Center-Lewis Field is well below the average day/night sound level of the Cleveland-Hopkins International Airport. Noise levels at the Glenn Research Center-Lewis Field fence line are generally below 70 dB(A), with much of this noise attributable to off-site sources.

The NASA Glenn Research Center Environmental Management Office (EMO) has reviewed noise contours received from the City of Brook Park for noise projected in 2006 and beyond, once the new runway at Cleveland-Hopkins International Airport is fully operational.⁵⁵ The proposed NSSC location is between the 70-75 dB DNL (day-night level) contours. Occupational Safety and Health Administration (OSHA) regulations require a hearing conservation program for an 8- hour time-weighted-average of 90 dB or more. NASA policy requires hearing conservation for an exposure of 85dB or more for any length of time.

3.4.3.2 Environmental Consequences

The Glenn Research Center NSSC nomination stated that noise levels would temporarily increase due to construction activities and high noise levels (above 80 dB(A)) during construction would have minimal impact. Operation of the proposed NSSC would generate low noise levels compared to the other facilities at the Glenn Research Center-Lewis Field, and the Cleveland- Hopkins International Airport. NASA would adhere to local noise ordinances under the Noise Control Act of 1972 and hearing conservaton requirements under NASA policy and OSHA regulations.

3.4.4 Air Quality

3.4.4.1 Affected Environment

The City of Cleveland conducts air quality monitoring for Cuyahoga County which tracks carbon monoxide, nitrogen oxide, nitrogen dioxide, sulfur dioxide, PM-10, total suspended particulates, ozone, and toxic air pollutants. As of this writing, Cuyahoga County is designated as an attainment area, though changing conditions and regulations may influence this designation in the future.

Stationary on-site emission sources at Glenn Research Center include boilers, heaters, research test cells, and many additional insignificant and trivial sources. The boilers housed in the steam plant represent the largest actual emission source at Lewis Field. The various research combustion sources represent the largest potential emission sources at Lewis Field.⁵⁶

⁵⁵ Noise Compatibility Plan 2006 part 150 update, cited in FAA, CLE Airport Expansion, EIS

⁵⁶ GRC Environmental Resources Document (ERD), 2003

3.4.4.2 Environmental Consequences

The Glenn Research Center NSSC nomination stated that construction and operation of the proposed NSSC would minimally impact air quality. Dust control measures would be used during construction under State of Ohio regulations. If emissions from construction equipment and grading operations were found to exceed applicable *de minimis* levels (i.e., levels which are so low that no regulatory authorization is required), then NASA would phase construction and implement other BMPs to reduce emissions.

Depending on the circumstances over the long term, NASA may develop a transportation management plan with mitigation measures such as managing construction traffic and adopting incentives for limiting parking, flexible work schedules, telecommuting, using public transportation, alternative fueled vehicles, carpooling, and alternative modes of transportation. If required, NASA would also develop congestion mitigation plans.

3.4.5 Water Resources

3.4.5.1 Affected Environment

The primary surface water features at Glenn Research Center-Lewis Field and in the vicinity of the proposed NSSC are Rocky River and its tributary, Abram Creek. Rocky River flows along the western edge of Glenn Research Center-Lewis Field, separating Glenn Research Center-Lewis Field from the Rocky River Reservation of the Cleveland Metropolitan Park District. The Ohio Environmental Protection Agency lists the drainage area of the Rocky River at 761 km² (294 mi²). Wastewater discharges and removals within the basin are significant and result in an effective 7-day, 10-year low flow of 0.87 cubic meters (30.6 cubic feet) per second. After passing the proposed NSSC site and Glenn Research Center-Lewis Field, the Rocky River flows north approximately 18 km (11 mi) before discharging into Lake Erie.⁵⁷

Abram Creek is a 6 km (4 mi) tributary of Rocky River and begins in a low-lying area south of Cleveland-Hopkins International Airport and flows through a heavily industrialized area, crossing the Glenn Research Center-Lewis Field property.⁵⁸

Surface water is not used for water supply at Glenn Research Center-Lewis Field and would not be used at the NSSC. Most surface water runoff from Glenn Research Center-Lewis Field flows through the storm sewer system and natural swales to Abram Creek and Rocky River. Although most precipitation is believed to flow overland, several low volume seeps have been observed on the Abram Creek Valley walls after periods of heavy rainfall.⁵⁹

⁵⁷ Ibid

⁵⁸ Ibid

⁵⁹ Ibid

Groundwater would not be used for water supply at the proposed NSSC site. There is no evidence of groundwater contamination at the Glenn Research Center-Lewis Field site or the Aerospace Technology Park NSSC site. No aquifer at Glenn Research Center-Lewis Field or in the vicinity of Aerospace Technology Park has been designated as a sole or principal drinking water source under the Safe Drinking Water Act. No underground injection wells are located at the Glenn Research Center-Lewis Field site or the proposed NSSC site.⁶⁰

The proposed NSSC site would include extensive stormwater management. A runoff retention pond would be incorporated into the landscape design to collect stormwater. Stormwater collected in the pond would be used to irrigate the landscaping and lawns around the proposed NSSC building. Upgrades to Aerospace Parkway include storm sewers and water mains that would support the proposed NSSC.

3.4.5.2 Environmental Consequences

Based on the Glenn Research Center NSSC nomination, groundwater or surface water resources would be minimally impacted.

3.4.6 Soils and Geology

3.4.6.1 Affected Environment

Bedrock in the immediate vicinity of Glenn Research Center-Lewis Field is composed of the Cleveland shale member of the Ohio shale. Cleveland shale member is dark gray to black, thin bedded, and weathers to thin slaty fragments that are stained brown. Cleveland shale is exposed in the bed and valley walls of the tributaries to Abram Creek, Abram Creek itself, and Rocky River.⁶¹

The 1999 Wetlands Delineation Study Report⁶² indicates that Parcel Q, proposed for the NSSC, consists of several types of poorly drained (both hydric and non-hydric) soil types. Parcel Q has a drainage ditch, two drainage-ways (East and Northeast), and an intermittent stream in its southern portion.

Soils in the area of the proposed NSSC do not have any known contamination.

⁶⁰ *ibid*

⁶¹ *Ibid*

⁶² *Wetlands Delineation Study Report*, June 1998, HZW Environmental Consultants for the US Army Corps of Engineers.

3.4.6.2 Environmental Consequences

The proposed NSSC would minimally impact soils. Erosion controls would be used to minimize impacts during construction. Soil sampling to confirm the lack of contamination would be required as a condition of a lease or contract.

Once constructed, the proposed NSSC would not result in wind or water erosion of soils since areas of potentially exposed soil would consist either of impervious surfaces or landscaping. Topography and ground surface relief features would not be changed substantially, and therefore, neither regional or local drainage patterns would be altered. However, in view of the seasonal stream and drainage features present on and near parcel Q, drainage would need to be managed to prevent seasonal flooding near the proposed NSSC.

3.4.7 Biological Resources

3.4.7.1 Affected Environment

The site of the proposed NSSC is in the migratory path, but at the edge of the nesting range, of the Indiana bat, a Federally endangered species. In addition, past reviews have indicated that dead trees, which exist on this site, may be typical habitat for the Indiana bat, although no bats have been found in the area. An endangered species survey conducted for Glenn Research Center in 2002, found no evidence of the Indiana bat. No other threatened or endangered species occur in the area.

Potentially threatened (State listed) plant species at Glenn Research Center-Lewis Field include the American chestnut (*Castanea dentate*) and the pigeon grape (*Vitis cinerea*) but these are not known to be present at Parcel Q.

3.4.7.2 Environmental Consequences

The Glenn Research Center NSSC nomination stated that the City of Brook Park would contact the Ohio Department of Natural Resources and USFWS to determine if an endangered species survey is required, and, if endangered or threatened species or critical habitat occurs at the NSSC site, what mitigation would be required.

As a precaution, NASA would require a pre-construction survey of the proposed NSSC site for the Indiana bat. If evidence of the species is present, NASA in coordination with the City of Brook Park would contact the USFWS to discuss mitigation. Mitigation may involve delaying construction until the Indiana bat has vacated the property and removing trees during non-nesting seasons (colder months).

NASA would take all available steps to prevent introduction of non-native or inappropriate vegetation species that may invade and degrade surrounding habitat for native vegetation species. Landscape maintenance activities would be carefully monitored using the applicable

EMS to ensure that the existing vegetation and the natural community composition and structure are not degraded and that vegetation does not create a hazard to aviation. Impacts to the area would be avoided or minimized by facility design and siting to maintain as much existing, native vegetation as possible.

At this site, if threatened or endangered species or other protected species are discovered, or candidate species become listed as threatened or endangered, NASA would consult with the U.S. Fish and Wildlife Service in accordance with applicable statutes, regulations, and Executive Orders.

3.4.8 Ecological Resources

3.4.8.1 Affected Environment

The Glenn Research Center NSSC nomination stated that the proposed site is not in a regulatory floodplain but that the site contains approximately 3.84 ha (9.6 ac) of jurisdictional wetlands. A 1998 wetlands survey⁶³ indicated that Parcel Q, located east of Ruple Parkway, and proposed as NSSC site, is considered part of Wetland E because 80 percent of vegetation is typical of wetlands, but constitutes a minor portion of wetlands in the vicinity.

3.4.8.2 Environmental Consequences

The Glenn Research Center NSSC nomination stated that impacts to wetlands during construction cannot be avoided. However, the NSSC nomination also stated that not all the 3.84 ha (9.6 ac) of wetlands would be impacted. .

The Army Corps of Engineers (CoE) would need to be contacted and a Clean Water Act § 404 permit obtained. The City of Brook Park would incur the costs of mitigating wetland loss. If wetlands loss or degradation cannot be mitigated onsite, then wetlands mitigation is likely to take the form of compensation through wetland mitigation credits to restore wetlands associated with local wetlands and rivers and be consistent with wetlands mitigation activities associated with expansion of the Cleveland-Hopkins International Airport. Based upon wetlands mitigation by the City of Cleveland during the Cleveland-Hopkins International Airport Expansion Project, the wetlands would be replaced or existing wetlands would be purchased and preserved. The Army CoE would determine the ratio of destroyed wetlands to replaced or preserved wetlands during the permitting process.

⁶³ *Wetlands Delineation Study Report, 1998.*

3.4.9 Cultural and Historic Resources

3.4.9.1 Affected Environment

Glenn Research Center-Lewis Field undertook a cultural reconnaissance survey in 1996 to inventory National Register eligible resources in its possession. The survey cited two Glenn Research Center-Lewis Field facilities that have been designated National Historic Landmarks: the Rocket Engine Test Facility (RETF) and the Microgravity Research Laboratory (Zero Gravity Facility).⁶⁴ No archeological sites were identified.

The Ohio State Preservation Office (SHPO) maintains an on-line database identifying the locations of known archeological sites throughout the state. Review of the database indicated a scattering of known archeological sites in the vicinity, but outside the assumed boundaries of Parcel Q. Based on this evidence, it is possible that artifacts exist within Parcel Q. The predictive model developed for Lewis Field in the 1996 Gray and Pape Overall Cultural Resource Reconnaissance Survey of NASA Lewis Research Center, Cleveland, Ohio report also suggests that it is possible that significant prehistoric artifacts could be encountered in this area though it is less likely that artifacts would be found at sites, such as Parcel Q, that are located more than 300 m (1000 ft) from a source of water. A 1998 Phase 1 archaeological study of the adjacent Cleveland-Hopkins International Airport Project Area,⁶⁵ which is adjacent to the NSSC site and groundtruthing at other areas in the vicinity of Parcel Q for the Final Environmental Impact Statement (FEIS) for the Cleveland-Hopkins International Airport Expansion failed to find artifacts. Excavations associated with improvements to Aerospace Parkway and nearby utilities did not encounter archeological materials.

3.4.9.2 Environmental Consequences

Because the FEIS for the Cleveland-Hopkins International Airport Expansion describes Parcel Q as undeveloped and no evidence exists to suggest that the soil in Parcel Q has been highly disturbed, any artifacts that may be found would still be present.

The Glenn Research Center NSSC nomination indicated that field testing and consultation with the SHPO may be required. Because of the possibility that artifacts may be found during excavation, and because of cost considerations, the Ohio SHPO recommended a site survey prior to excavation, rather than once excavation is underway. NASA would therefore require a Level 1 field survey prior to construction, and require provisions for unanticipated discovery during construction. If artifacts are found during the field survey or excavation, NASA would cease excavation and consult with the SHPO under §106 National Historic Preservation Act. Mitigation may include adjusting the footprints of the NSSC, adjusting phasing in of construction to allow data recovery, curating artifacts, and displaying information about the site

⁶⁴ GRC, *Environmental Resources Document*, August 2003

⁶⁵ Cited in the FAA CLE Airport Expansion EIS

for the public. Consultation with tribes may be required depending on the nature of any artifacts found.

3.4.10 Environmental Justice

3.4.10.1 Affected Environment

Glenn Research Center has developed a comprehensive Environmental Justice Implementation Plan and a Supplement to the Environmental Justice Implementation Plan. Five Census tracts were identified within an 8 km (5 mi) region of influence that are likely to meet Federal environmental justice criteria for minority or low-income communities.⁶⁶

Workforce diversity, local transportation access, access by other NASA Centers, and safe and healthful working conditions are criteria considered in each nomination. Each nomination considered opportunities for further employee development in the vicinity of the proposed NSSC and opportunities for partnering with local educational institutions, including minority institutions.

According to the Glenn Research Center nomination, development of the NSSC would not have disproportionately high and adverse human health or environmental effects on environmental justice populations or adverse impacts on the environmental health and safety of children. Suitable access and facilities would be provided for staff and visitors with handicapping conditions.

3.4.10.2 Environmental Consequences

Using LandView 6 (2004) software, a merging of selected databases from the EPA and USGS, and DOC Census Bureau TIGER files from the 2000 Census, NASA assessed socioeconomic and other relevant environmental justice factors for the Glenn Research Center vicinity. Although the Glenn Research Center focused its environmental justice strategy on creating opportunities for the five census tracts with minority and low-income populations within an 8 km (5 mi) radius of influence, this environmental justice consequence analysis was expanded to a 16 km (10 mi) and an 80 km (50 mi) radius from which the NSSC labor pool could be drawn.

Figure 3-9 shows that all census tracts within 16 km (10 mi) of the Glenn Research Center site have a predominantly white population of between 80 and 100 percent. However, within an 80 km (50 mi) radius, numerous tracts occur with a considerable minority population of 60 to 80 percent minority that is likely to serve as part of the labor pool.

Other relevant socio-economic data to achieving environmental justice goals include the percentage with graduate degrees and median household income. Figure 3-10 shows that a diversified labor pool, capable of providing both skilled and unskilled labor for the NSSC

⁶⁶ GRC Environmental Resources Document, August 2003

workforce, is present within an easy commute of the proposed site at the Aerospace Technology Park.

Figure 3-11 shows a concentration of lower- income households near Aerospace Technology Park and Brook Park that may benefit from the economic and educational opportunities offered by the NSSC.

Figure 3-12 shows that the entire area within an 80 km (50 mi) radius of the proposed NSSC is relatively free of traffic congestion and permits a reasonably rapid (less than 30 minutes) commute to the proposed NSSC. This figure indicates that the mobility and access to work are not a concern.

NSSC would develop an NSSC-specific environmental justice strategy or apply the strategy of the host or nearby NASA Center



Figure 3-9. Aerospace Technology Park (A.4.1) 2000 Census Data - Percentage of White Persons

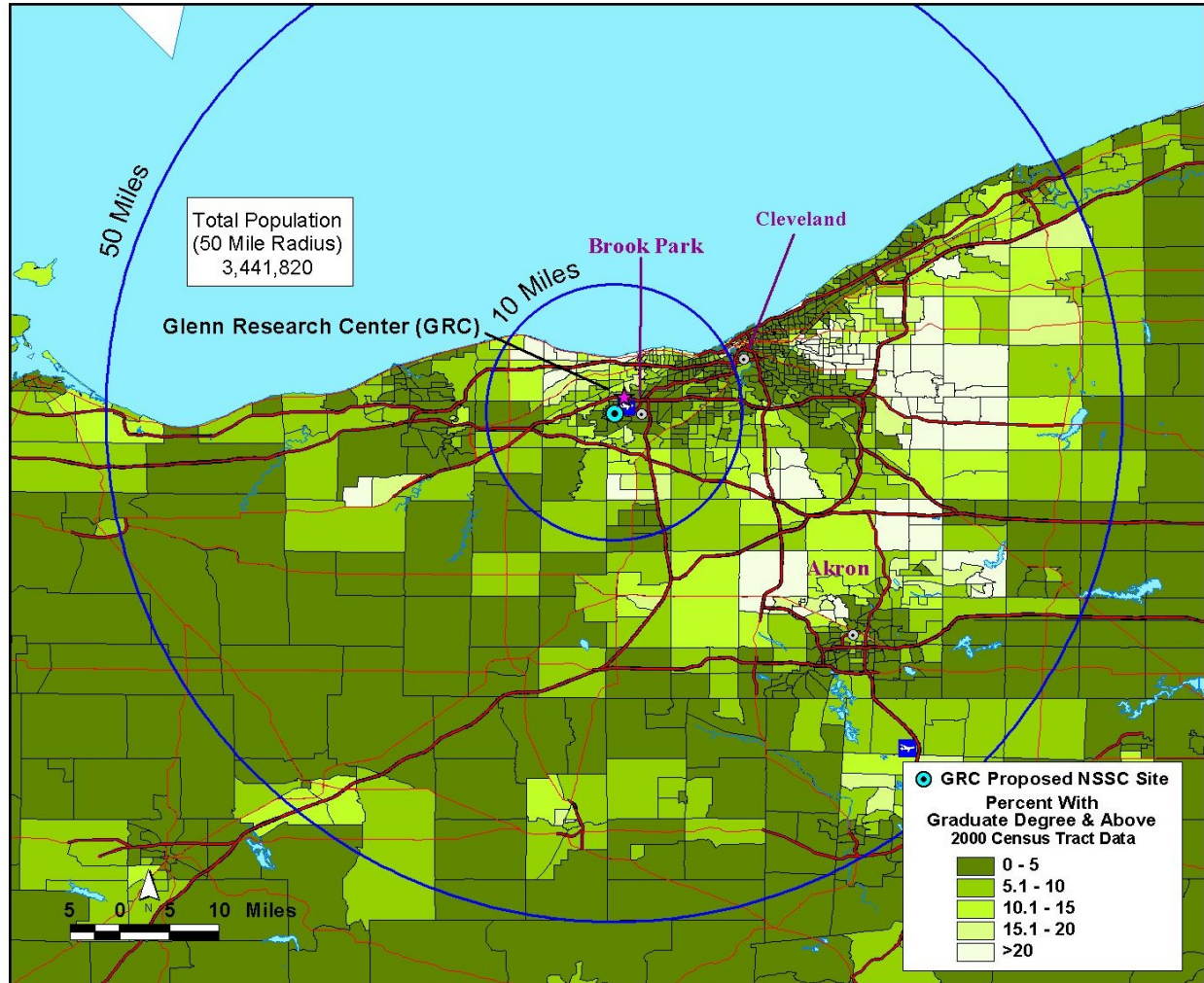


Figure 3-10. Aerospace Technology Park (A.4.1) 2000 Census Data - Percent with Graduate Degree and Above

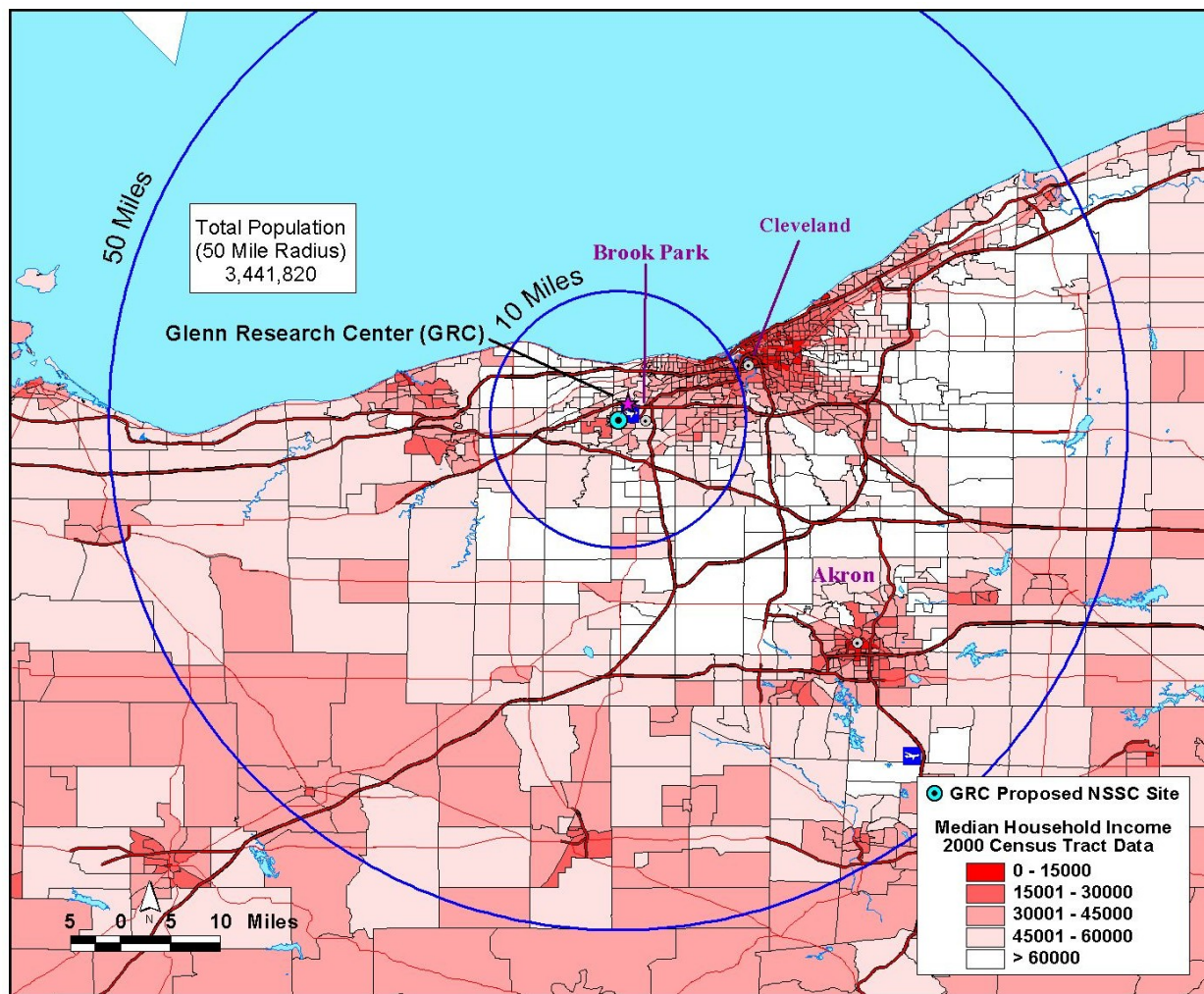


Figure 3-11. Aerospace Technology Park (A.4.1) 2000 Census Data - Median Household Income

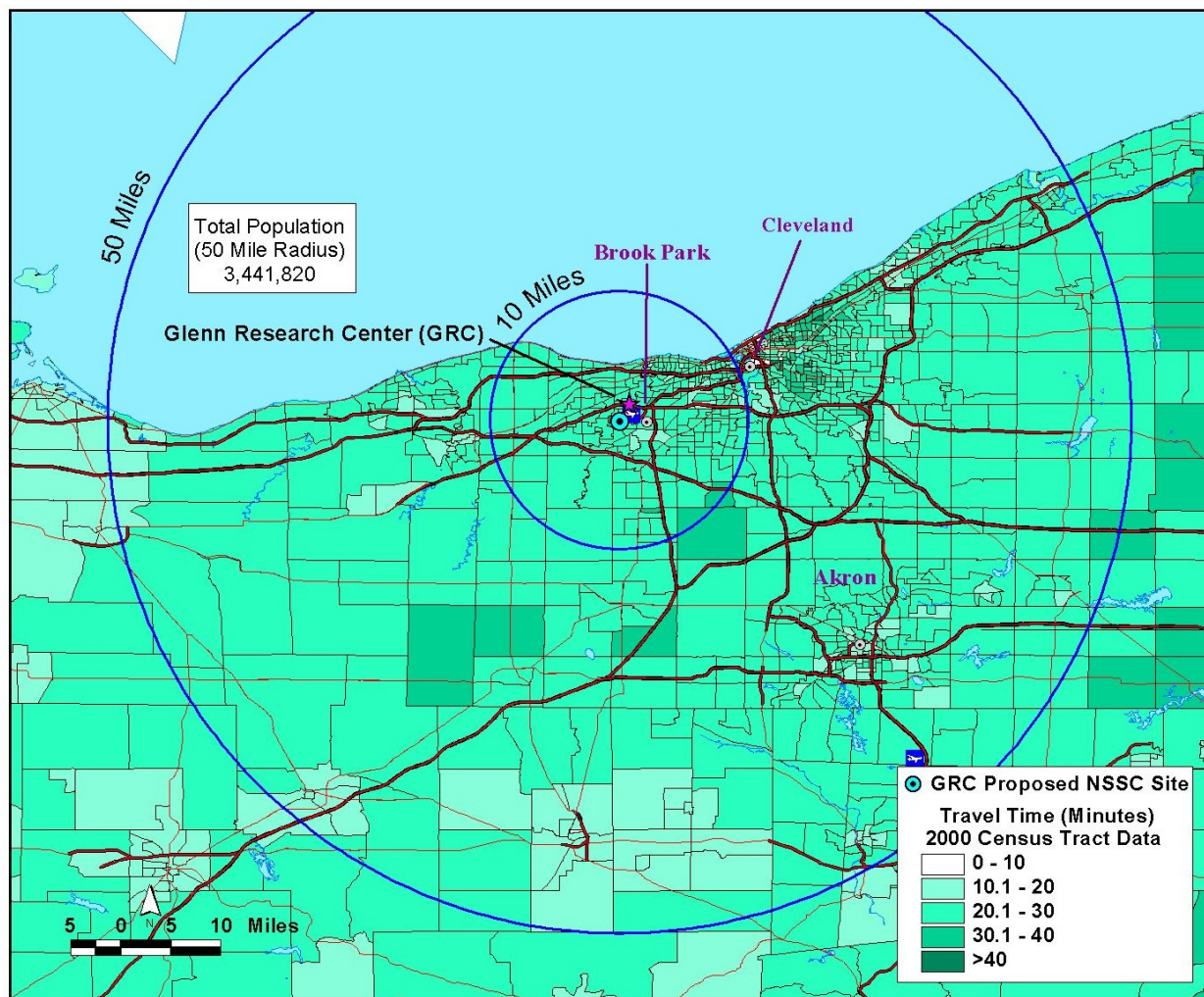


Figure 3-12. Aerospace Technology Park (A.4.1) 2000 Census Data - Travel Time in Minutes

Development of the NSSC would not have disproportionately high and adverse human health or environmental effects on environmental justice populations or adverse environmental impacts on the health and safety of children. Suitable access and facilities would be provided for staff and visitors with handicapping conditions. Even though the City of Brook Park has a 4 percent non-white population segment, according to 1999 Census data, the surrounding area within 80 km (50 mi) includes a diversified labor pool that would potentially derive economic benefits from the proposed NSSC.

3.5 ALTERNATIVE A.4.2 NSSC OFF-SITE AT CENTRAL FLORIDA RESEARCH PARK

3.5.1 Facilities and Infrastructure

3.5.1.1 Transportation and Traffic

3.5.1.1.1 Affected Environment

The Central Florida Research Park (CFRP) is easily reached by the metropolitan Orlando expressway network and serviced by public mass transportation through connections with the University of Central Florida (UCF) internal bus system.

The CFRP is located at the entrance to the East-West Expressway, a limited-access toll road that provides a direct 20-minute commute to downtown Orlando and Orlando International Airport. The eastern Beltway intersects with the East-West Expressway approximately 6.4 km (4 mi) west of the CFRP and provides quick access to northern and southern Orange County.

Three primary roadways, each six lanes with a divided median, serve the proposed NSSC site. Colonial Drive (U.S. Highway 50) and University Boulevard run in an east-west direction, and are each located within 1.6 km (one mi) of the proposed NSSC site. Alafaya Trail (S.R. 434), is located less than one-half mile west of the proposed NSSC site, and provides north-south access. Research Parkway is a four lane, winding roadway, which provides direct access to the proposed NSSC site. Traffic signals are present at the intersection of Alafaya Trail and Research Parkway that is located less than one-half mile west of the proposed NSSC site.

The proposed NSSC facility would have a minimum of 500 parking spaces between surface and structured parking. The NSSC is planned to include a two-story parking deck to the east of the building. The property has frontage along both Technology Parkway and Science Drive. Science Drive can be accessed through the existing driveway at the SW corner of Research Commons Phase I. Access to Technology Parkway will require installation of a curb cut.

3.5.1.1.2 Environmental Consequences

The Kennedy Space Center NSSC nomination stated that the Development of Regional Impact (DRI) report, which was approved by the East Central Florida Regional Planning Council, presents a detailed analysis of traffic impacts as a result of the full build out of CFRP. The analysis took into account a number of specific planned improvements to roads around the CFRP vicinity. Given these planned improvements, the CFRP at build-out would not produce significant impacts to traffic within the area around CFRP. Since the time that this analysis was completed, all of these improvements have been implemented. The NSSC would form part of the build-out of the CFRP.

3.5.1.2 Solid and Hazardous Waste Generation and Management

3.5.1.2.1 Affected Environment

The CFRP currently generates solid waste and recyclable materials such as paper and plastics. These materials are currently collected by local waste management and recycling companies for appropriate disposal or treatment. Solid waste is disposed of at the Orange County landfill.

3.5.1.2.2 Environmental Consequences

The Kennedy Space Center NSSC nomination stated that no significant impacts to solid waste generation and management would occur. The Orange County landfill has sufficient capacity to accept solid waste from the NSSC construction and operation at full build-out of the CFRP.

The developer would be responsible for managing any hazardous materials, such as paints and solvents, used during construction and any hazardous wastes produced as part of the construction activities in accordance with normal management practices as required by State and local agencies.

3.5.1.3 Public Services and Utilities

3.5.1.3.1 Affected Environment

Progress Energy provides electrical power to the CFRP, through two feeder lines each with a capacity of 12MW. Within the grid internally to the CFRP there is excess capacity of more than 6 MW. The three-story building would be engineered to maximize floor plate efficiency and building utility systems. Electric upgrades would include generator power backup and dual feed underground power supply to a single transformer from a substation located on the north side of the CFRP.

Orange County Research and Development Authority provides water to the CFRP from a well. The University of Central Florida provides sewer services with backup/redundant service provided by Orange County. The wastewater treatment plant is immediately near the CFRP and contains more than sufficient capacity to receive the expected discharge from the NSSC.

3.5.1.3.2 Environmental Consequences

The Kennedy Space Center NSSC nomination stated that the impact to local or regional power supplies from the addition of the NSSC to the CFRP is not expected to be significant. Progress Energy has the capacity to supply the NSSC's planned power needs. The NSSC would be subject to Federal energy reduction and water conservation goals established in the National Energy Conservation Policy Act and the energy efficiency mandates of E.O. 13123 and other laws. NASA would also designate a part- or full-time NASA NSSC Energy Manager. Installation of new utilities would be reviewed to avoid or minimize environmental impact.

The NSSC would house primarily office personnel. This type of activity would be expected to produce a water demand of 100 liters (25 gallons) per day per employee. The CFRP has an approved Consumptive Use Permit for water use for the entire CFRP, which would support full build-out of the CFRP, including the NSSC. No modifications to the wastewater treatment permit would be required.

3.5.1.4 Communication

3.5.1.4.1 Affected Environment

Communication services, including but not limited to conventional telephone service, internet service, and other data transmission services are available at the CFRP, but not at the site of the proposed NSSC.

3.5.1.4.2 Environmental Consequences

Communication services would need to be extended to the NSSC. This extension would have no or minimal impact to the environment. Local companies would provide these services. An existing NASA contract for computer and telephone equipment would provide equipment.

3.5.2 Land Use

3.5.2.1 Affected Environment

The proposed NSSC site in the CFRP is an undeveloped parcel of land. The property is bounded to the north by Challenger Tech Center Phases I-IV, six high-end flex-tech office buildings, and to the south, east, and west by a heavy landscape buffer and then retail and multifamily developments.

The property is bounded to the east by Research Commons Phase I, a 4-story Class A office building; to the south by Science Drive and undeveloped land beyond; to the west by Technology Drive and both undeveloped land/multifamily beyond; and to the north by the Naval Air Warfare Center/STRICOM facility.

3.5.2.2 Zoning

The property is zoned as Industrial-3 (Ind-3) and is part of the Central Florida Research Park Development of Regional Impact. The Central Florida Research Park Declaration of Covenants, Conditions and Restrictions govern development, use and construction within the Central Florida Research Park (The Central Florida Research Park Authority must approve each specific tenant).

3.5.2.3 *Environmental Consequences*

The Kennedy Space Center NSSC nomination stated the NSSC would alter the land. However, the land is located in area already designated for construction, and has been modified by previous clearing and fill activities.

Since the CFRP is the fully permitted land use approved by the DRI for the site, the planned land use at the site is not expected to be impacted by the NSSC. If NASA does not locate the NSSC here, another similar use would occur at the same site.

3.5.3 Noise

3.5.3.1 *Affected Environment*

Noise levels at the CFRP are within normal limits for a business office park, consisting of mostly street traffic and the occasional aircraft overhead.

3.5.3.2 *Environmental Consequences*

Construction of the NSSC would generate noise associated with normal construction activities. Operation of the NSSC would generate low noise levels. NASA would adhere to local noise ordinances under the Noise Control Act of 1972.

3.5.4 Air Quality

3.5.4.1 *Affected Environment*

The Kennedy Space Center NSSC nomination stated that the proposed NSSC facility would not contain any new stationery air emission sources. The CFRP has been fully reviewed and permitted by State and local air quality regulatory agencies. Commuter traffic would generate mobile source emissions consistent with the planned DRI-approved full build-out expansion of the CFRP.

3.5.4.2 *Environmental Consequences*

The Kennedy Space Center NSSC nomination stated that no significant impacts to air quality would occur as a consequence of development of the NSSC. The most likely source of air emissions would be from traffic. The DRI addressed air quality impacts from the CFRP through extensive air pollution modeling based on the expected full build-out of the CFRP. These analyses showed that all predicted concentrations of potential air pollutants would be below all applicable State and federal standards, even under worst case meteorological conditions.

3.5.5 Water Resources

3.5.5.1 Affected Environment

Surface features within the CFRP include small lakes, streams, and canals, many of which have been constructed. The water quality of these features is good. No contamination issues are associated with any of these water bodies. No surface water bodies on the site are proposed for use in the NSSC and storm-water controls are already in place.

The Iron Bridge Wastewater Treatment Plant owned and operated by the City of Orlando and Seminole County provides domestic wastewater. The plant is fully permitted by the State of Florida. The CFRP owns, operates, and maintains the wastewater collection and transmission system within the CFRP. The treatment plant is located near the CFRP and contains more than sufficient capacity to receive the expected discharge from the NSSC.

Groundwater is made up of the surficial aquifer, which extends from a few feet below the land surface (during the wet season) to about 16.6 m (50 ft) below the land surface. Below the surficial aquifer is the secondary artesian aquifer, the potable water supply for the CFRP. Based on monitoring, these aquifers do not contain any significant contamination.

The CFRP has an existing master storm-water management system. In addition, the parcel within CFRP proposed for NSSC development has existing treatment capacity already built. The only new permitting required is a site plan approval and any minor modifications required to connect the site to the existing treatment systems. The CFRP also has an approved Consumptive Use Permit for water use for the entire CFRP that supports full build-out of the CFRP. Water is from a 0.3 m (12 inch) well 134 m (400 ft) deep. The NSSC would house primarily office personnel. This type of activity would be expected to produce a water demand of 100 liters (25 gallons) per day per employee.

The proposed NSSC facility would be constructed on a site that contains a permitted storm-water treatment system and is already approved by the State of Florida for development. Storm-water retention facilities would be constructed off-site but would be part of the master retention plan for the CFRP. The storm-water infrastructure already at the CFRP was designed and is maintained to protect the local aquifer and sensitive wetland habitat in the area.

3.5.5.2 Environmental Consequences

The Kennedy Space Center NSSC nomination stated that the impact of the NSSC on surface water and groundwater would not be significant. Construction of the NSSC should not encounter any groundwater contamination. Based on the Consumptive Use Permit for water use, the aquifer is expected to have sufficient capacity to supply all of CFRP requirements. The impact of the NSSC on potable water supplies would not be significant.

Construction of the NSSC would temporarily increase the amounts of sedimentation and pollutants that could migrate into nearby surface water systems. During construction activities,

impacts to surface waters in the area would be minimized, by ensuring that BMPs are initiated and maintained to control erosion and sedimentation.

The South Florida Water Management District is a regional agency of the State of Florida, and is charged with managing and protecting water resources of the region by balancing and improving water quality, flood control, natural systems, and water supply. The regional water management district would issue an Environmental Resource Permit.⁶⁷

The CFRP has the following approvals: Development of Regional Impact (DRI), Master Stormwater Plan and Permit, an adjacent dedicated Sewage Treatment System, and a Consumptive Use Permit (potable water)

3.5.6 Soils and Geology

3.5.6.1 Affected Environment

Environmental information in the Kennedy Space Center NSSC nomination stated no unique or limiting features relating to either the geology or soils occur at the CFRP. The proposed site for NSSC construction has been previously cleared and additional fill has been added.

3.5.6.2 Environmental Consequences

The Kennedy Space Center NSSC nomination stated construction and operation of the NSSC on the proposed site within the CFRP would not produce significant impacts to soil and geology locally or regionally.

Once constructed, the NSSC would not have any impact in terms of wind or water erosion of soils since there no areas of soil would be exposed. The entire site would consist either of impervious surfaces or landscaping. Topography and ground surface relief features would not be changed substantially, and neither regional nor local drainage patterns would be altered.

3.5.7 Biological Resources

3.5.7.1 Affected Environment

The Kennedy Space Center NSSC nomination stated that threatened and endangered plant or animal species habitats are highly unlikely on the proposed NSSC site. Environmental information provided in the Kennedy Space Center NSSC nomination stated that DRI studies found no such species. The site has been cleared and filled, resulting in secondary growth unlikely to include threatened and endangered plants or support threatened or endangered animals.

⁶⁷ <http://www.sfwmd.gov/site/index.php>

3.5.7.2 *Environmental Consequences*

NASA would take all available steps to prevent introduction of non-native or inappropriate vegetation species that may invade and degrade surrounding habitat for native vegetation species. Landscape maintenance activities would be carefully monitored via the EMS to ensure that the existing vegetation and the natural community composition and structure are not degraded. Although the site has been cleared, felled, and recovered with secondary growth, impacts to the area would be avoided or minimized by facility design and siting to maintain as much existing, native vegetation as possible. If threatened or endangered species or other protected species are discovered, or candidate species become listed as threatened or endangered, NASA will consult with the U.S. Fish and Wildlife Service in accordance with applicable statutes, regulations, and Executive Orders.

3.5.8 *Ecological Resources*

3.5.8.1 *Affected Environment*

Environmental information provided in the Kennedy Space Center NSSC nomination stated that the site proposed for NSSC construction has been previously cleared and fill has been added. No wetlands occur on the site.

3.5.8.2 *Environmental Consequences*

The Kennedy Space Center NSSC nomination stated that no impacts to wetlands would occur.

3.5.9 *Cultural and Historic Resources*

3.5.9.1 *Affected Environment*

According to the Kennedy Space Center NSSC nomination, no historic or archeological resources are known to occur within the CFRP.

3.5.9.2 *Environmental Consequences*

The Kennedy Space Center NSSC nomination stated no impacts to cultural and historic resources would occur. Under the National Historic Preservation Act, NASA would seek concurrence from the Florida SHPO. NASA would require as a condition of a lease or contract that if unanticipated discovery of archaeological resources occurs, construction would cease. NASA, in cooperation with the developer, would consult with the Florida SHPO, and if required, develop and implement a mitigation plan. A mitigation plan would likely include adjustment of the footprint, adjustment of the construction schedule, data recovery, curation, and public education, such as through a display on site.

3.5.10 Environmental Justice

3.5.10.1 Affected Environment

Workforce diversity, local transportation access, access by other NASA Centers, and safe and healthful working conditions are criteria considered in each nomination. Each nomination considered opportunities for further employee development in the vicinity of the proposed NSSC and opportunities for partnering with local educational institutions, including minority institutions.

3.5.10.2 Environmental Consequences

The Kennedy Space Center NSSC nomination states that development of the NSSC would not have disproportionately high and adverse human health or environmental effects on minority or low-income populations or adverse impacts on the environmental health and safety of children. Suitable access and facilities would be provided for staff and visitors with handicapping conditions.

Using LandView 6 (2004) software, a merging of selected databases from the EPA and USGS, and DOC Census Bureau TIGER files from the 2000 Census; NASA assessed socioeconomic and other relevant environmental justice factors for Kennedy Space Center and vicinity within an 80 km (50 mi) radius, including the Orlando, Kissimmee and Titusville Metro area. This radius defined the area from which the NSSC labor pool could be drawn.

Figure 3-13 shows that within 16 km (10 mi) of the NSSC site there are quite a few of census tracts have a 40 to 60 percent minority population, and within 80 km (50 mi) there are tracts with even higher percentage. Environmental justice efforts should focus on opportunities for these census tracts.

Other relevant socio-economic data to achieving environmental justice goals include the percentage with graduate degrees and above and median household income. Figure 3-14 shows that least 5-10 percent of those living within 16 km (10 mi) of the CFRP hold advanced degrees, but there are tracts with even better educated pools of labor for the NSSC within 80 km (50 mi).

Figure 3-15 shows that within 16 km (10 mi) of CFRP people are relatively well off, with median household income exceeding \$30,000 to 45,000. However, there are economically disadvantaged areas within an 80 km (50 mi) radius, which are likely to benefit, rather than be adversely affected, by the economic and educational opportunities from the NSSC.

Figure 3-16 shows that while the commute to CFRP is generally good; less than 30 minutes within 16 km (10 mi) and some tracts within 80 km (50 mi), some commuters may encounter highly congested areas and have commutes longer than 40 minutes. While the entire area surrounding the NSSC is accessible to prospective workers, better mobility and access could ensure that environmental justice is not a concern, and that no population segments would be adversely impacted.

Phase 2 Environmental Assessment – NASA Shared Services Center

Development of the NSSC would not have disproportionately high and adverse human health or environmental effects on environmental justice populations within the area analyzed. No adverse impacts on the health and safety of children are anticipated. Suitable access and facilities would be provided for staff and visitors with handicapping conditions. The NSSC would develop an NSSC-specific environmental justice strategy or apply the strategy of the host or nearby NASA Center.

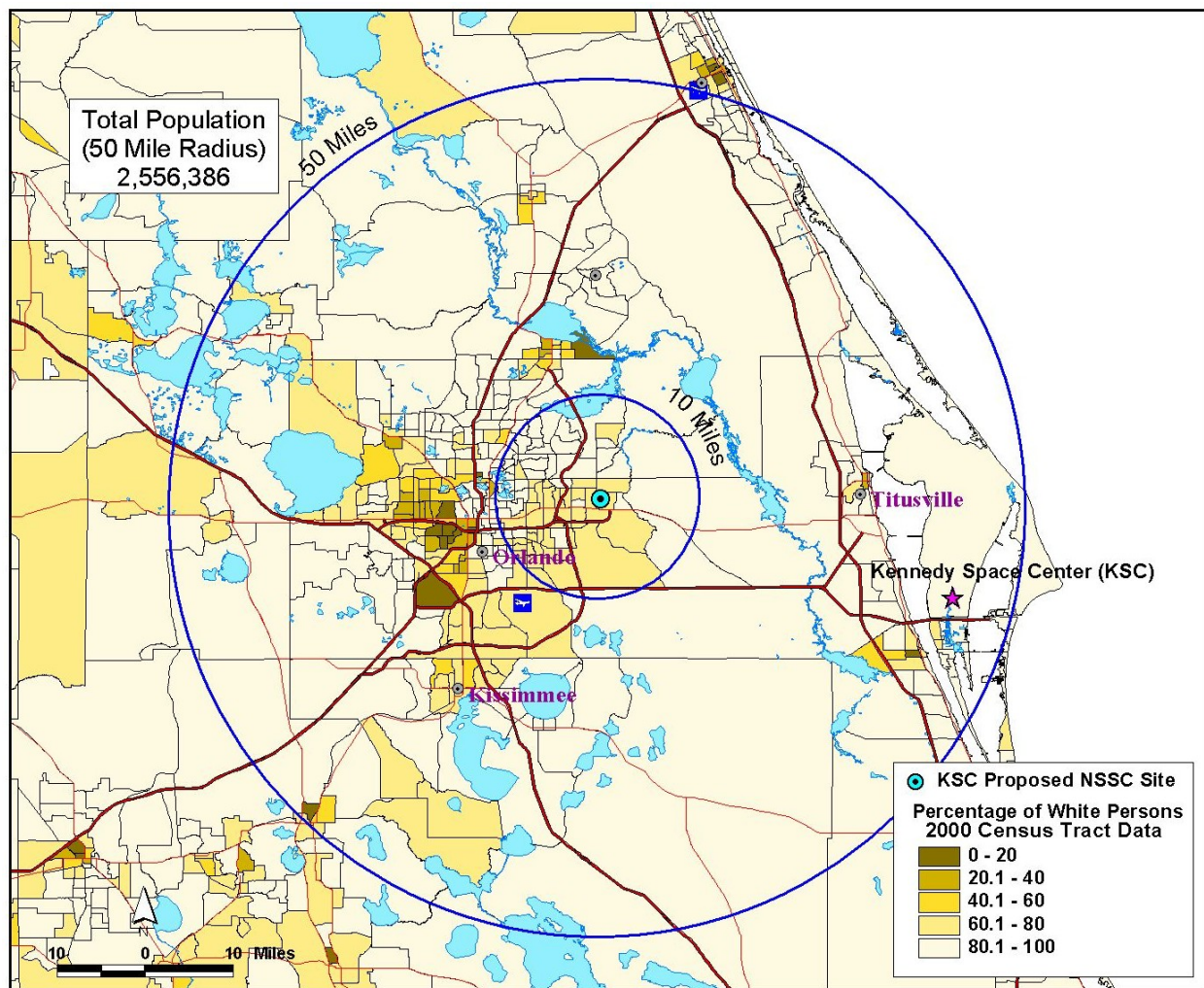


Figure 3-13. Central Florida Research Park (A.4.2) 2000 Census Data - Percentage of White Persons

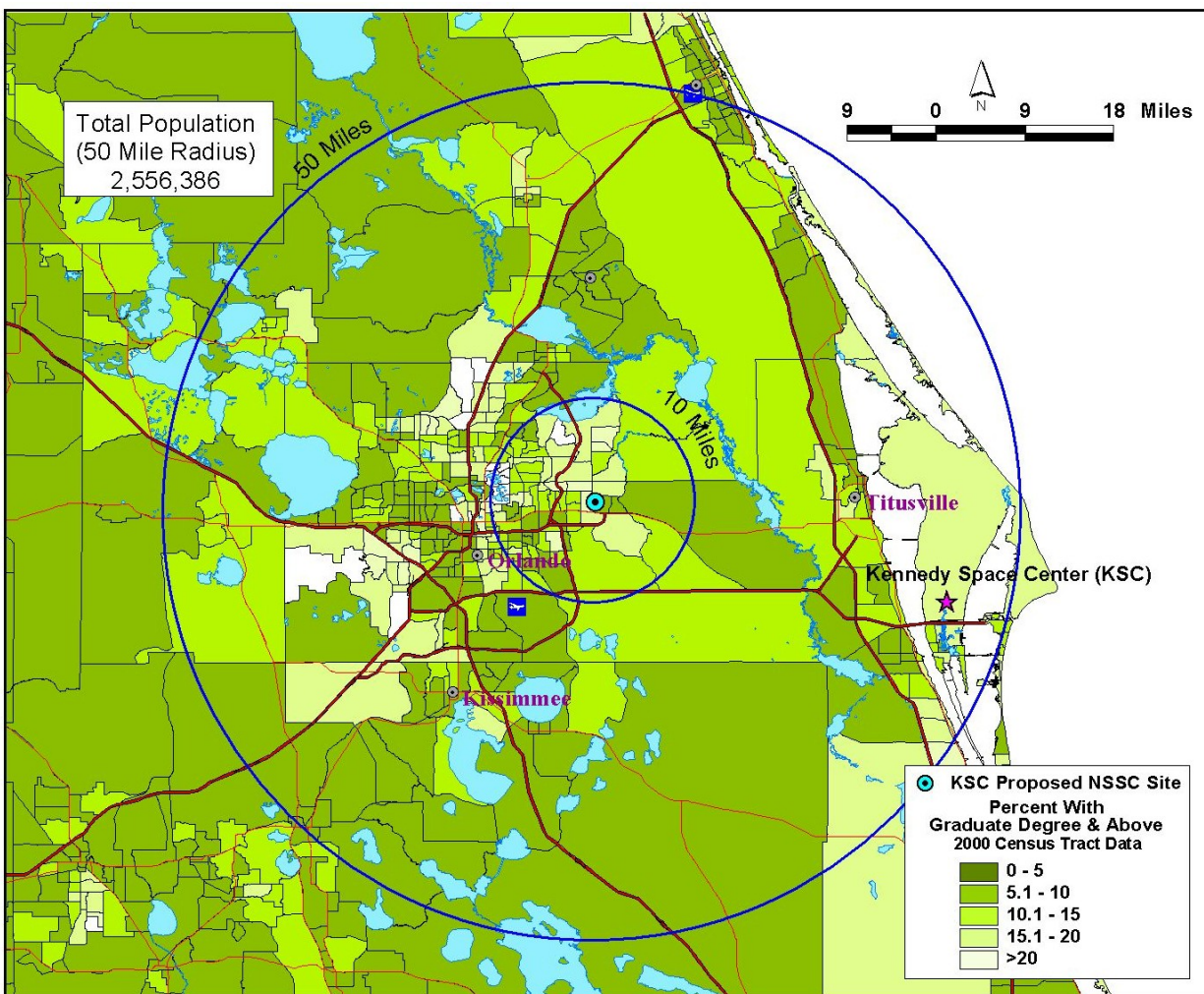


Figure 3-14. Central Florida Research Park (A.4.2) 2000 Census Data - Percent with Graduate Degree and Above

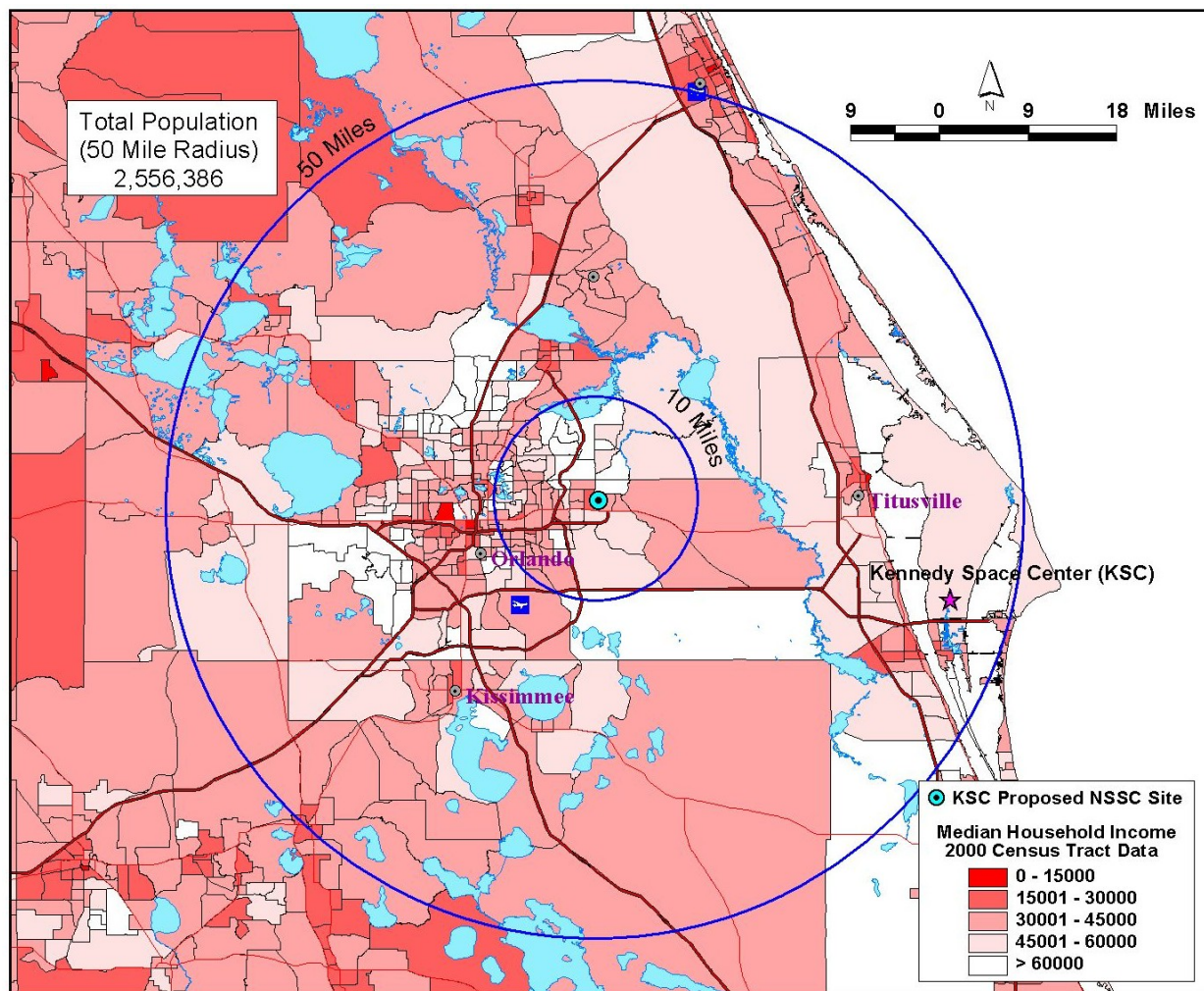


Figure 3-15. Central Florida Research Park (A.4.2) 2000 Census Data - Median Household Income

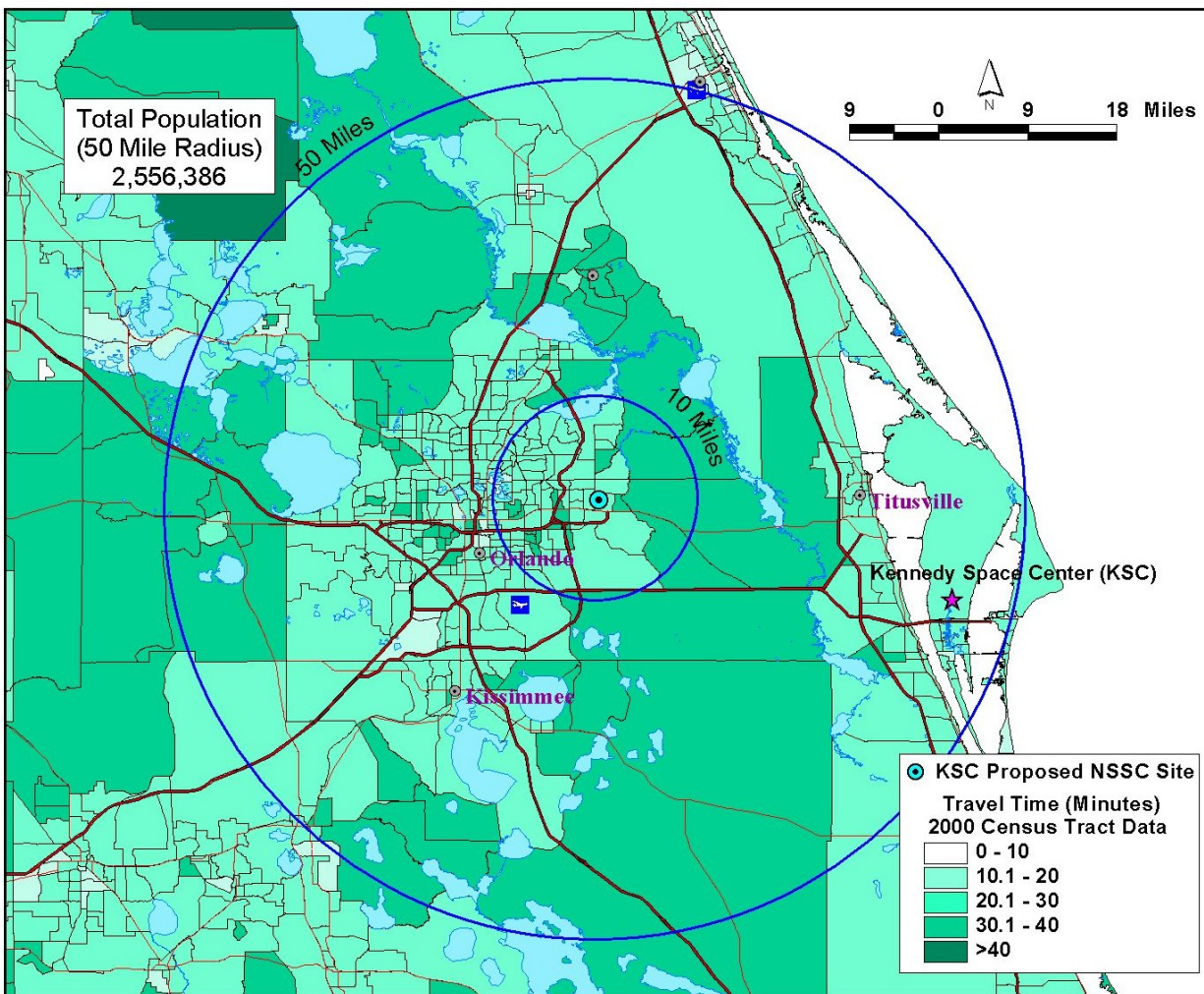


Figure 3-16. Central Florida Research Park (A.4.2) 2000 Census Data - Travel Time in Minutes

3.6 ALTERNATIVE A.4.3 NSSC OFF-SITE AT CITY CENTER AT OYSTER POINT

3.6.1 Facilities and Infrastructure

3.6.1.1 Transportation and Traffic

3.6.1.1.1 Affected Environment

Oyster Point is bounded by three arterial roads; J. Clyde Morris Boulevard (U.S. 17), Jefferson Avenue (VA 143) and Oyster Point Road (VA 171) and Interstate 64. Oyster Point is directly served by two Interstate 64 interchanges; with a third interchange providing alternative access from the north. The intersection of major east-west and north-south traffic thoroughfares makes Oyster Point the Virginia's Peninsula's central place. These arterials all have six-lanes to provide maximum ease of traffic flow. Approximately 235,000 vehicles pass Oyster Point on a daily basis.

The NSSC would be accessible from Interstate 64. The NSSC facility would have a five-story parking structure that would accommodate the 470 employees of the NSSC. Short-term on street parking for visitors and longer-term parking in the parking structure would also be available.

3.6.1.1.2 Environmental Consequences

According to the NASA Langley Research Center nomination, the NSSC may impact transportation and traffic. Although City Center at Oyster Point has been approved for New Urbanism development as part of larger redevelopment goals for the area, NASA may develop a transportation management plan with mitigation measures, such as incentives for limiting parking, providing flexible work schedules, telecommuting, using public transportation, using alternative fueled vehicles, carpooling, encouraging alternative modes of transportation and, if required, implementing construction of traffic management measures.

3.6.1.2 Solid and Hazardous Waste Generation and Management

3.6.1.2.1 Affected Environment

According to the NASA Langley Research Center nomination, no evidence of hazardous substance or petroleum products use, treatment, storage, disposal, generation or recycling on the adjacent properties has been found. The former bunker has been removed and the large Oyster Point site has been cleared to begin construction for the planned hotel and convention center.

City Center at Oyster Point currently generates solid waste and recyclable materials such as paper and plastics. Local waste management and recycling companies collect materials for appropriate disposal and treatment.

3.6.1.2.2 Environmental Consequences

The NSSC would generate the types of solid waste and recyclable wastes that are generated by existing facilities at Oyster Point. The NSSC would be constructed and operated in a way that reduces waste generation and encourages recycling and reuse of materials. Recyclables would be stored in a designated area.

The developer would be responsible for managing hazardous materials, such as paints and solvents, used in construction and hazardous wastes produced as part of the construction activities, and would follow normal management practices as required by State and local agencies.

3.6.1.3 Public Services and Utilities

3.6.1.3.1 Affected Environment

Public and private utilities servicing the proposed property include Newport News City public water and public sanitary sewer services, Virginia Natural Gas, and Dominion Power electrical service.

Power and telephone service conduits would be extended underground and connected to existing services, in accordance with utility power requirements, with primary power provided by Virginia Power.

The NSSC facility would have a complete heating, ventilation, and air-conditioning (HVAC) system throughout the newly constructed building. The HVAC system would be in compliance with all building codes and regulations applicable to this type of building at the time of construction.

3.6.1.3.2 Environmental Consequences

NSSC demand on power, potable water and sewage infrastructure would not adversely impact local utility companies since the NSSC would consume relatively small quantities of electricity and water relative to local supply. Power and telephone service would be extended underground and connected to existing service, in accordance with utility provider requirements. No adverse impacts are expected, given the standard utility practices for electric power transmission and distribution to the site and on the NSSC property.

The NSSC would be subject to Federal energy reduction and water conservation goals established in the National Energy Conservation Policy Act and E.O. 13123, Greening the Government Through Efficient Energy Management, June 1999. NASA would designate a part- or full-time NASA NSSC Energy Manager. New utilities would be installed and operated in a manner that avoids or minimizes environmental impact.

3.6.1.4 Communication

3.6.1.4.1 Affected Environment

Communication services, including, but not limited to conventional telephone service, Internet service, and other data transmission services are available at Oyster Point but not at the site of the proposed NSSC, with services provided by local companies. Equipment would be provided through an existing NASA contract for computer and telephone equipment.

3.6.1.4.2 Environmental Consequences

Communication services would need to be extended to the NSSC with no or minimal impact to the environment.

3.6.2 Land Use

3.6.2.1 Affected Environment

Oyster Point is the central business district of the Virginia Peninsula. A private development group is developing City Center at Oyster Point as a planned business, retail, and residential community, consistent with redevelopment goals for the area.

Properties surrounding the proposed NSSC site consist of Fountain Plaza area to the west followed by Blocks 1, 2, and 3. Further west are numerous office buildings. To the west of Block 6 is a parking garage, commercial office buildings, and undeveloped land, followed by a large drainage basin. Town Center Drive is located to the north of the site followed by undeveloped land and Canon Boulevard. Canon Boulevard and a commercial office building are located to the east of the site. To the south of the proposed NSSC site is Thimble Shoals Boulevard, beyond which are office buildings.

The Langley Research Center NSSC nomination indicated that the U.S. Army previously used the property and several aboveground, small arms ammunition storage bunkers are present. A Phase 1 Environmental Site Assessment of potential soil contamination did not recommend a Phase 2 assessment. The bunkers have been removed.⁶⁸

3.6.2.2 Environmental Consequences

The Langley Research Center NSSC nomination stated that some impact to land use would occur. The planned site development uses a New Urbanism approach, consistent with the State and local plans for redevelopment of the area which balance preserved green spaces with the built environment.

⁶⁸ Jan Benson EMO, NASA LaRC communication to Ann Clarke, NASA Headquarters.

3.6.3 Noise

3.6.3.1 Affected Environment

No extraordinary noise occurs in the vicinity of Oyster Point. The site is not in the flight path of aircraft coming or going from the Newport News airport and only an occasional aircraft from Langley Air Force Base passes overhead.

3.6.3.2 Environmental Consequences

Construction of the NSSC would generate temporary noise. Operation of the NSSC would generate low noise levels. NASA would require adherence to local noise ordinances under the Noise Control Act of 1972.

3.6.4 Air Quality

3.6.4.1 Affected Environment

Newport News is part of the Norfolk/Hampton Roads/Tidewater area of Virginia. Oyster Point is located in an Air Quality Attainment area. The only pollutant that occasionally exceeds Federal health standards during the warmer months is ground-level ozone. Five major point sources occur within 16 km (10 mi) of Oyster Point, emitting 90 metric tons (100 tons) or more of criteria pollutants (VOC, NO_x, carbon monoxide (CO), PM 10, sulfur dioxide (SO₂), or PM 2.5).⁶⁹

3.6.4.2 Environmental Consequences

Environmental information provided in the Langley Research Center NSSC nomination stated air quality would not be adversely affected. Dust generated during construction is subject to regulation and enforcement by the Virginia DEQ.

3.6.5 Water Resources

3.6.5.1 Affected Environment

According to the Langley Research Center nomination, no water bodies occur on the proposed NSSC site.

The elevation of the shallow water table is transient and can vary greatly with seasonal fluctuations in precipitation. Movement in this water table is generally from higher to lower elevations. As such, groundwater would be expected to flow generally to the west toward the large drainage basin located to the immediate west of Block 1.

⁶⁹ Virginia Department of Environmental Quality, 2004.

Site storm drainage would consist of reinforced concrete pipes or fully coated corrugated metal pipe and fittings extending from a point 1.8 m (5 ft) beyond the building line, and connecting to site lines and structures. The proposed NSSC site would be graded to slope to new and existing drainage structures, including a containment vault, for reuse in landscape irrigation. Drainage structures would be designed to meet Virginia Department of Transportation standards and established site development standards. Stormwater management plans include the design of pump and water lines from stormwater retention vault to a site irrigation system and limiting the impervious paved surface area.

3.6.5.2 Environmental Consequences

The Langley Research Center NSSC nomination stated that water resources may be impacted. No water bodies occur at the proposed NSSC site. During construction of the NSSC, impacts to surface waters in the vicinity would be minimized, by ensuring that BMPs are used and maintained to control erosion and sedimentation. A change in the ground surface from vegetative cover to a largely impermeable paved surface would occur, and precipitation would runoff instead of infiltrating the soil, thus disturbing local hydrologic and soil processes. Surface runoff would be collected in on-site stormwater facilities and discharged according to permit requirements.

3.6.6 Soils and Geology

3.6.6.1 Affected Environment

The soils in this area are the residual product of in-place chemical weathering of rock presently underlying the site. Surveys of sites surrounding the proposed NSSC site do not indicate site contamination or a history of site contamination.

A Phase 1 Environmental Site Assessment of the Newport News Town Center (Blocks 6 and 7) indicated that the U.S. Army previously used the property and maintained several aboveground, small arms ammunition storage bunkers at the proposed site. Based upon available information, the World War II era ammunition bunkers formerly located on the proposed site for storage purposes may have posed an environmental threat of contamination, but these bunkers have been removed. The Phase 1 Site Assessment of soils contamination near the NSSC site did not recommend a Phase 2 assessment.⁷⁰

3.6.6.2 Environmental Consequences

Erosion controls would be used to minimize impacts during construction. Once constructed, the NSSC would not have any impact in terms of wind or water erosion of soils since there would not be any areas of exposed soil. The entire site would consist either of impervious surfaces or

⁷⁰ Jan Benson EMO, communication with Ann Clarke, NASA Headquarters.

landscaping. Topography and ground surface relief features would not be changed substantially, and therefore neither regional nor local drainage patterns would be altered.

3.6.7 Biological Resources

3.6.7.1 Affected Environment

The Langley Research Center NSSC nomination indicated no threatened or endangered species occur on the proposed NSSC site or critical habitat.

3.6.7.2 Environmental Consequences

Environmental information provided in the Langley Research Center NSSC nomination indicated no impact on threatened and endangered species would occur. If threatened or endangered species or other protected species are discovered, or candidate species become listed as threatened or endangered, NASA will consult with the U.S. Fish and Wildlife Service in accordance with the applicable statutes and regulations.

NASA would take all available steps to prevent introduction of non-native or inappropriate vegetation species that may invade and degrade surrounding habitat for native vegetation species. Landscape maintenance activities would be carefully monitored via the applicable EMS to ensure that the existing vegetation and the natural community composition and structure would not be degraded. Impacts to the area would be avoided or minimized by facility design and siting to maintain as much existing, native vegetation as possible.

3.6.8 Ecological Resources

3.6.8.1 Affected Environment

The Langley Research Center nomination indicated that the site is not located in a floodplain. The proposed property is located within the Coastal Plain. The Coastal Plain Physiographic Province extends from the Fall Zone at the eastern edge of the Piedmont Province eastward to the Atlantic Ocean. The topography of the Coastal Plain is a terraced landscape that slopes toward the coast and the major rivers.

3.6.8.2 Environmental Consequences

The Langley Research Center nomination indicated that wetlands or floodplains impacts would not occur. The proposed NSSC is consistent with the Virginia State Coastal Zone Management Plan.

3.6.9 Cultural and Historic Resources

3.6.9.1 Affected Environment

Based on historical records, the U.S. Army used the property during World War II for the location of several aboveground, small arms ammunition storage bunkers. The bunker located on Block 6 has been removed.

Based on a data search and communication with the Virginia SHPO, no historic properties are located in the vicinity of Oyster Point. Locating the NSSC in the City Center development is unlikely to affect any historic properties.

3.6.9.2 Environmental Consequences

Cultural or historic resources would not be impacted. However, as a condition of a contract or lease, NASA would require that if unanticipated discovery of archeological or historic resources occurs during excavation of parcels 6 and 7, construction would cease, and NASA would consult with the Virginia SHPO to if mitigation is required. Mitigation may include data recovery, curation, and display of artifacts at the NSSC facility.

3.6.10 Environmental Justice

3.6.10.1 Affected Environment

Workforce diversity, local transportation access, access by other NASA Centers, and safe and healthful working conditions are criteria considered in each nomination. Each nomination considered opportunities for further employee development in the vicinity of the proposed NSSC, and opportunities for partnering with local educational institutions, including minority institutions.

According to the NASA Langley Research Center nomination, development of the NSSC would not have disproportionately high and adverse human health or environmental effects on environmental justice populations. The environmental health and safety of children would not be impacted. Suitable access and facilities would be provided for staff and visitors with handicapping conditions.

The affected environment was expanded beyond the 16 km (10 mi) radius near Langley Research Center in the Newport News metro area, up to an 80 km (50 mi) radius, including Virginia Beach and Williamsburg, within commuting distance from the proposed site. The NSSC labor pool may be drawn from this entire area.

3.6.10.2 Environmental Consequences

Using LandView 6 (2004) software, a merging of selected databases from the EPA and USGS, and DOC Census Bureau TIGER files from the 2000 Census; NASA assessed socioeconomic

and other relevant environmental justice factors for Langley Research Center and vicinity within an 80 km (50 mi) radius. This radius defined the area from which the NSSC labor pool could be drawn.

Figure 3-17 shows that within 16 km (10 mi) of the proposed NSSC site several census tracts with predominantly white populations are present, but up to half the area has a high (60-80 percent) minority population. A similar profile and several minority population concentrations occur within 80 km (50 mi) of the proposed NSSC site.

Other relevant socio-economic data to achieving environmental justice goals include the percentage with graduate degrees and above and median household income. Figure 3-18 shows several tracts with more than 20 percent highly educated people living within 16 km (10 mi) of the proposed NSSC, but also tracts with educationally disadvantaged population. This uneven distribution holds for the entire area within 80 km (50 mi) of the NSSC.

Figure 3-19 shows the majority of households within 16 km (10 mi) of the NSSC site are relatively well off, with most median household income exceeding \$ 30-45,000, and several tracts averaging more than \$60,000 near Langley Research Center. However, several economically disadvantaged census areas occur within the 16 km (10 mi) and 80 km (50 mi) radius, which are likely to benefit, rather than be adversely affected, by the economic and educational opportunities from the NSSC.

Figure 3-20 shows that while the commute to the City Center site is typically less than 30 minutes within 16 km (10 mi) and some tracts within the 80 km (50 mi) radius, a few tracts have commutes longer than 40 minutes. Although mobility could be improved in some areas, the entire area surrounding the NSSC is accessible to prospective workers.

The NASA NSSC would develop an NSSC-specific environmental justice strategy or apply the strategy of the host or nearby NASA Center.

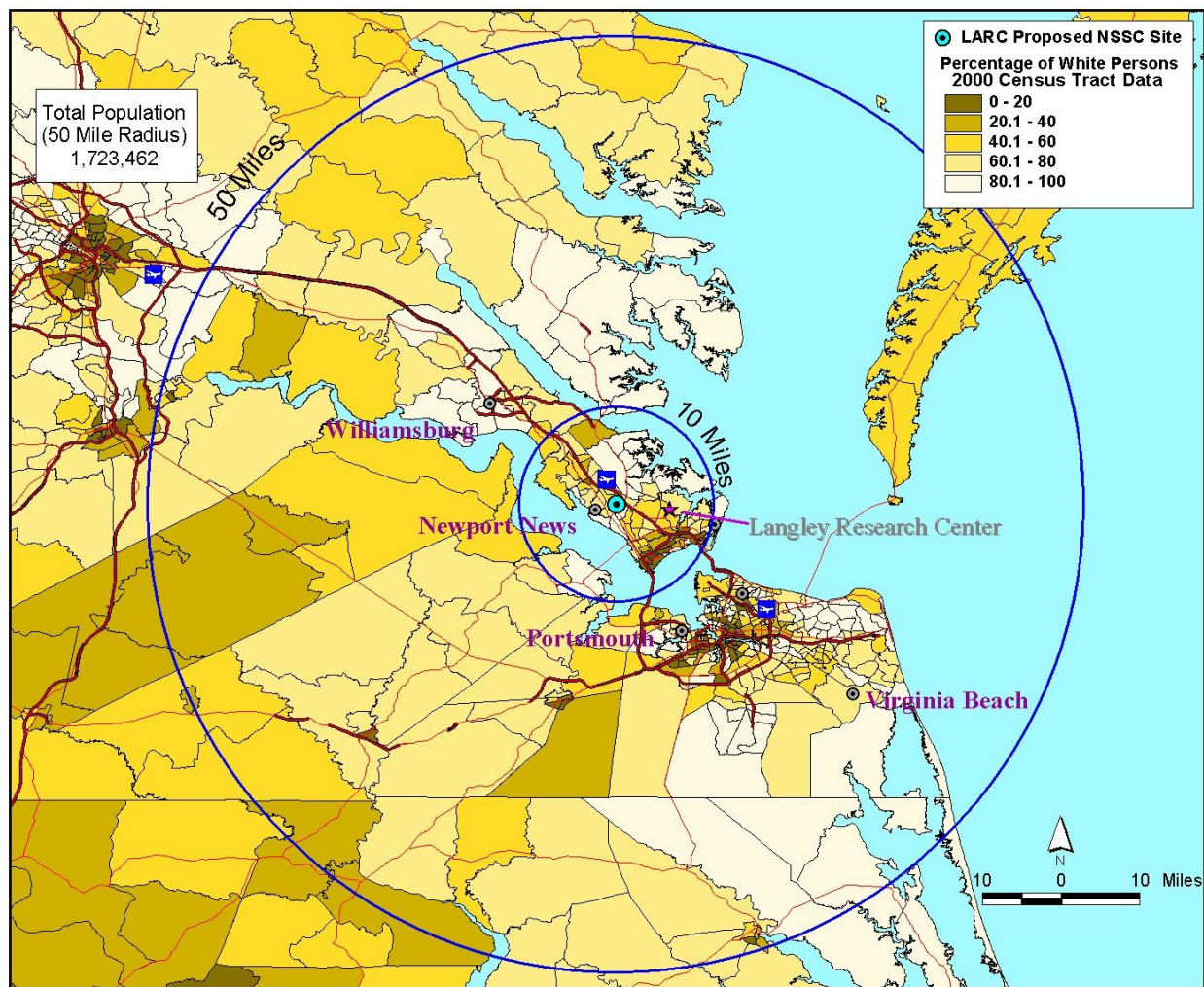


Figure 3-17. Oyster Point at City Center (A.4.3) 2000 Census Data - Percentage of White Persons

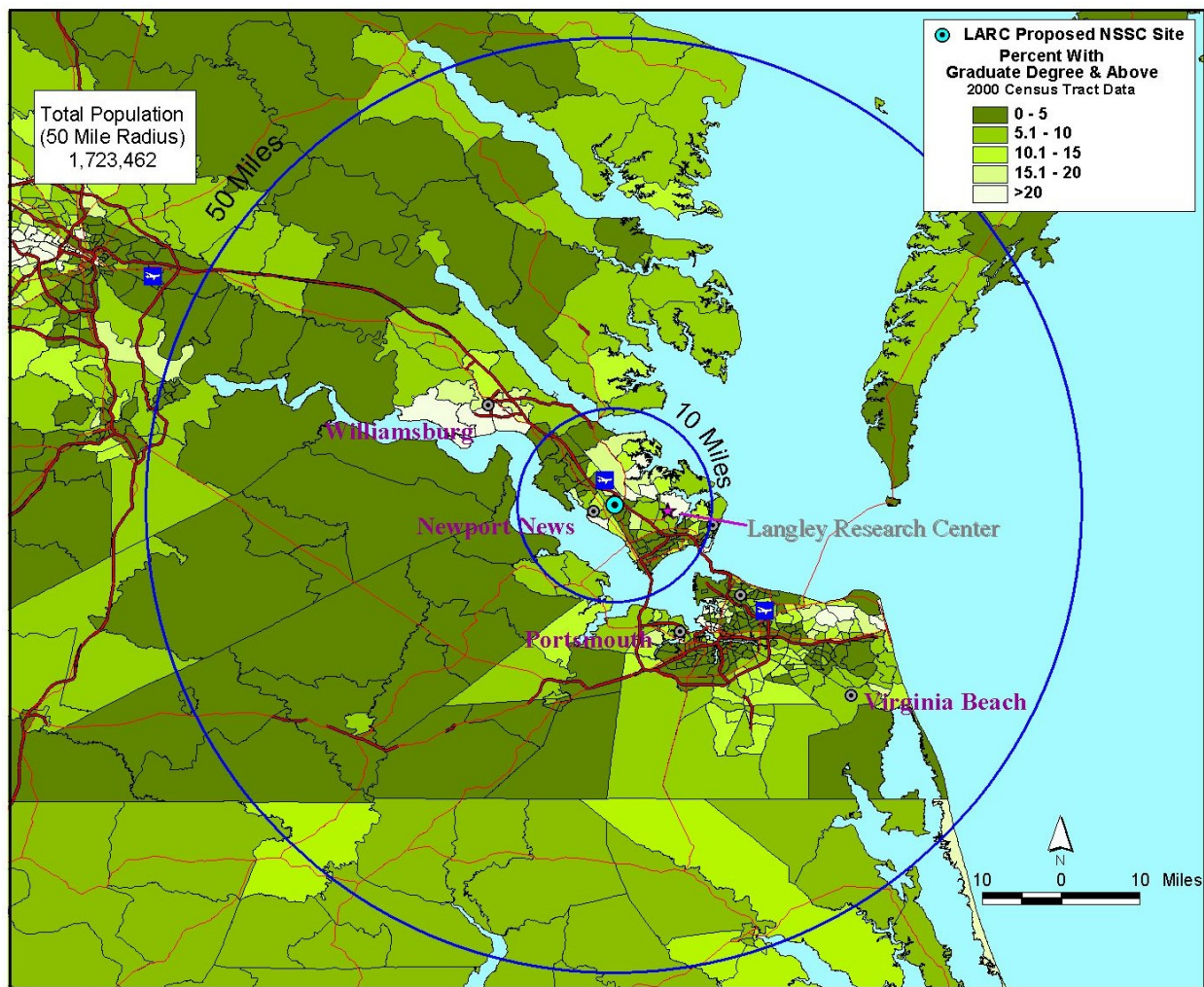


Figure 3-18. Oyster Point at City Center (A.4.3) 2000 Census Data - Percent with Graduate Degree and Above

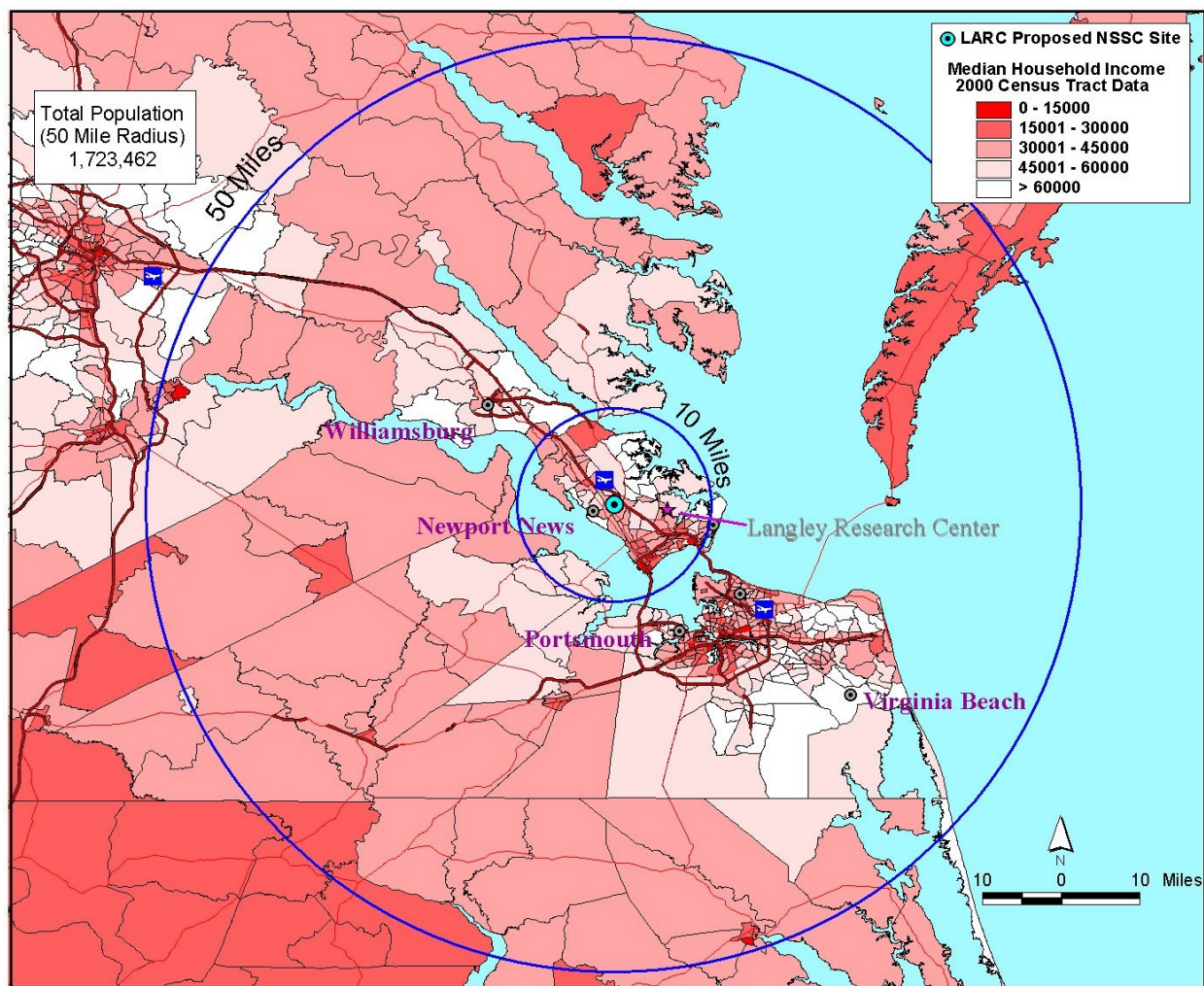


Figure 3-19. Oyster Point at City Center (A.4.3) 2000 Census Data - Median Household Income

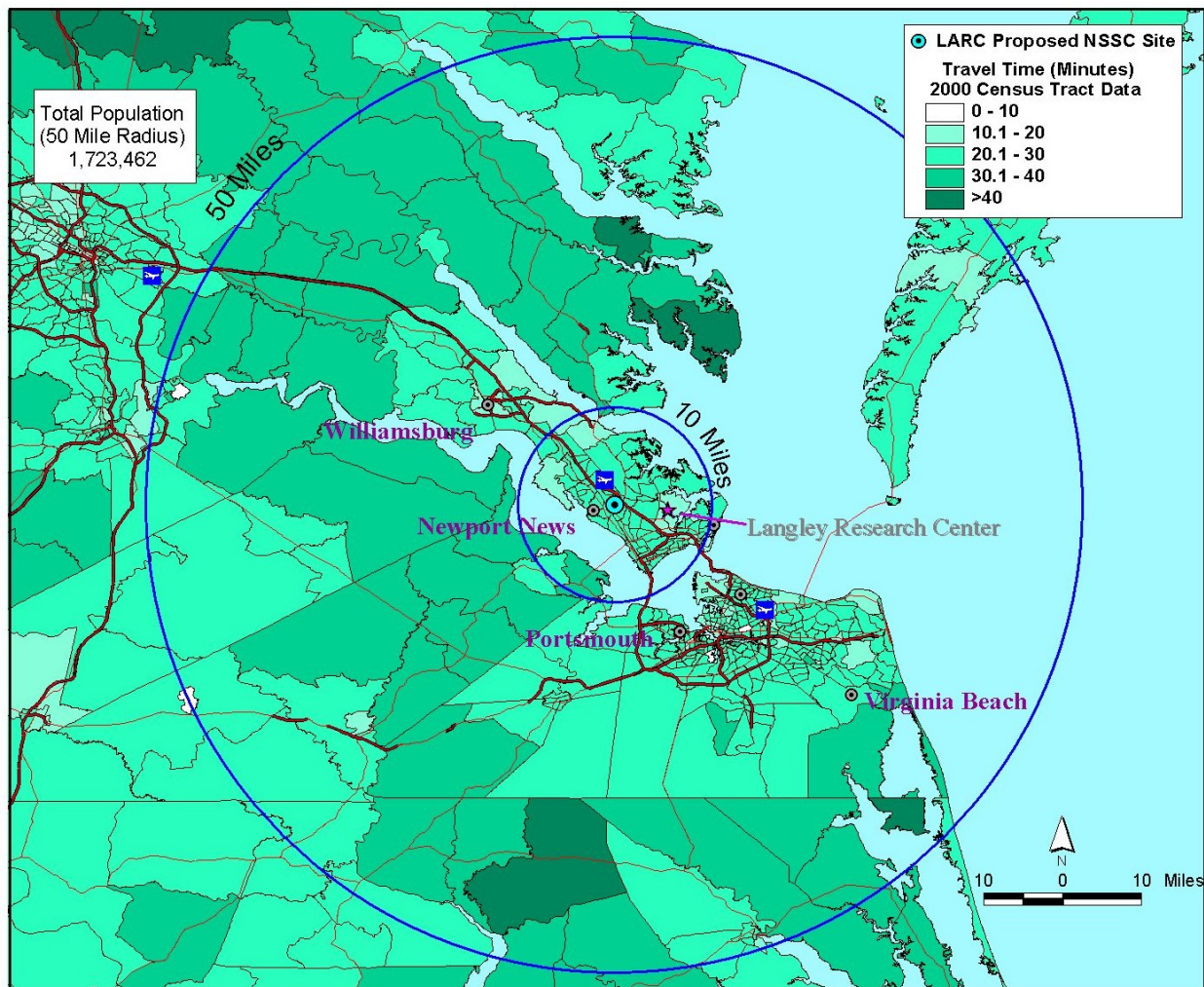


Figure 3-20. Oyster Point at City Center (A.4.3) 2000 Census Data - Travel Time in Minutes

Development of the NSSC would not have disproportionately high and adverse human health or environmental effects on environmental justice populations. No adverse impacts on the environmental health and safety of children are anticipated. Suitable access and facilities would be provided for staff and visitors with handicapping conditions.

3.7 ALTERNATIVE A.4.4 NSSC OFF-SITE AT CUMMINGS RESEARCH PARK

3.7.1 Facilities and Infrastructure

3.7.1.1 Transportation and Traffic

3.7.1.1.1 Affected Environment

The proposed site at Cummings Research Park (CRP) is located near Interstates 565 and 65 and is convenient to Huntsville International Airport.

Highway access to CRP is from Interstate 565, which links Interstate 65 to downtown Huntsville. The State of Alabama Department of Transportation (DOT) and the U.S. Federal Highway Administration are in the process of improving Interstate 65, Interstate 565, and the interchange from Interstate 565 to NASA Marshall Space Flight Center and the CRP. Huntsville International Airport is approximately a ten-minute drive from CRP.

Parking would be immediately adjacent to the building with sufficient Americans with Disabilities Act-compliant spaces as required by code. Vanpool parking would be required. The proposal indicates the CRP would provide 591 parking spaces plus an additional 187 spaces for the NSSC.

The NASA Marshall Space Flight Center nomination stated that the U.S. DOT Federal Transit Administration has funded a grant for the City of Huntsville to provide intermodal transportation options, allowing employees of research park companies to access the hotel, dining, retail and service amenities at the new Bridge Street development located 1.6 km (1.0 mi) from the NSSC site.

3.7.1.1.2 Environmental Consequences

The NASA Marshall Space Flight Center nomination stated that the NSSC would have little or no impact on transportation. The CRP is in full operation. Both major roadways enter the CRP and connect with internal roadway networks. Roadway capacity is adequate, although slowdowns occur during morning and evening rush hours. Alabama DOT is reconfiguring portions of Interstate 565, which would alleviate traffic problems. The increased traffic due to the proposed NSSC would thus have little to no impact on traffic conditions. Parking would be adequate.

3.7.1.2 Solid and Hazardous Waste Generation and Management

3.7.1.2.1 Affected Environment

The CRP currently generates solid waste and recyclable materials such as paper and plastics. Local waste management and recycling companies currently collect these materials for

appropriate disposal or treatment. The Alabama Department of Environmental Management (ADEM) Industrial Compliance Section reports that there are no known Resource and Recovery Act issues related to the proposed NSSC property. In addition, the ADEM Environmental Assessment Section has no knowledge of any assessments (e.g., Superfund or brownfield) undertaken in the past several years or planned for the coming year⁷¹.

3.7.1.2.2 Environmental Consequences

The NSSC would generate the types of solid waste and recyclable wastes already generated by existing facilities at the CRP. The NSSC would be constructed and operated in a way that reduces waste generation, and encourages recycling and reuse of materials. A designated area would store recyclables. Existing waste management and recycling companies would provide the NSSC with collection and disposal services for solid waste and recyclable materials. No major change in the level of current waste and recyclable materials collection services at the CRP would be required.

The developer would be responsible for managing any hazardous materials, such as paints and solvents, used during construction or hazardous wastes produced as part of the construction activities, and would follow normal management practices as required by State and local agencies.

3.7.1.3 Public Services and Utilities

3.7.1.3.1 Affected Environment

The CRP is fully served by public utilities including water, natural gas, electric, sanitary sewer and storm sewer services (along Old Madison Pike). Fire management services and medical emergency services are provided to CRP by the City of Huntsville.

The City of Huntsville has a citywide Stormwater Management Plan as part of their NPDES permit, which would cover the proposed NSSC location. The City of Huntsville monitors stormwater discharge and pollutants by source inspections and sampling, however measures taken to prevent stormwater pollution would be the responsibility of the developer.

3.7.1.3.2 Environmental Consequences

Providing power, potable water and sewage infrastructure to the NSSC would not adversely impact local utility companies since the NSSC would consume relatively small quantities of electricity and water. Any new utilities would be installed and operated to avoid or minimize environmental impact.

⁷¹ Communication with Mr. Jim Grassiano, ADEM.

The NSSC would be subject to Federal energy reduction and water conservation goals established in the National Energy Conservation Policy Act and E.O. 13123. NASA would designate a part- or full-time NASA NSSC Energy Manager.

3.7.1.4 Communication

3.7.1.4.1 Affected Environment

Communication services, including but not limited to conventional telephone service, internet service, and other data transmission services are available at the CRP but not at the site of the proposed NSSC.

3.7.1.4.2 Environmental Consequences

Communication services would need to be extended to the NSSC with no or minimal impact to the environment. Communication services would be provided by local companies. An existing NASA contract would provide computer and telephone equipment.

3.7.2 Land Use

3.7.2.1 Affected Environment

The CRP currently consists of 1,536 ha (3,840 ac) and approximately 889 m² (8 million ft²) of research and development facilities, office complexes, and manufacturing operations.

Approximately 22,500 employees are employed at the CRP and more than 9,800 college students are enrolled within CRP. Adjacent to the CRP, the U.S. Army and NASA employ nearly 20,000 military and civilian professionals. Current tenants include: government and military research facilities, academic and non-profit research centers, Fortune 500 companies, and international technology-based companies.

According to the Marshall Space Flight Center NSSC nomination, aerial photographs of the proposed NSSC site indicate that the land use has been agricultural since at least as early as 1959. Cotton was grown on the property in 1996.

3.7.2.2 Environmental Consequences

The land designated for construction of the proposed NSSC has been zoned for institutional/campus development for technology and research, and would be used for this purpose, regardless of whether or not NASA awards the NSSC location to CRP. No impacts to land use would occur as a result of the proposed NSSC.

3.7.3 Noise

3.7.3.1 Affected Environment

Huntsville's Noise Ordinance limits the sound level of community and vehicle noise. The standards of the Ordinance are based on receiving land use categories and are designed to prevent exposure to excessive noise. The Huntsville Police Department enforces the provisions of the Ordinance relating to excessive noise from motor vehicles on public premises.

3.7.3.2 Environmental Consequences

Construction of the NSSC would temporarily increase noise. Operation of the NSSC would generate low noise levels. NASA would adhere to local noise ordinances under the Noise Control Act of 1972 during construction and operation of the NSSC.

3.7.4 Air Quality

3.7.4.1 Affected Environment

The Huntsville/Madison County area currently is classified as attainment for all criteria pollutants under the NAAQS. Four air monitoring stations are located in Madison County. The State and Local Air Monitoring Stations (SLAMS) PM-10 Monitor, located at 5006 Pulaski Pike, Huntsville, Alabama, is 12.8 km (8 mi) from the proposed NSSC site. This monitor has been in operation since 1970.

3.7.4.2 Environmental Consequences

Environmental information provided in the Marshall Space Flight Center NSSC nomination stated that the proposed NSSC would not increase air pollution or generate discharges into the air. No impact to air quality would occur that would cause the area to fall out of attainment for any criteria pollutant.

3.7.5 Water Resources

3.7.5.1 Affected Environment

The Marshall Space Flight Center NSSC nomination stated that permanent surface waters at the proposed NSSC site include Indian Creek to the west, the four ponds associated with CRP to the north, west and northwest and another pond located southwest of the site. The proposed NSSC site lies within the Indian Creek Drainage Basin.

The surface drainage system of Madison County consists of five drainage basins, all of which are part of the Tennessee River Basin. Surface drainage and sheet runoff at the proposed NSSC location generally flow to the south and east.

The U.S. Geological Survey maintains 21 water monitoring stations in Madison County, with the station closest to the proposed NSSC located at Indian Creek.

3.7.5.2 *Environmental Consequences*

Construction of the NSSC would temporarily increase the amounts of sedimentation and pollutants that could migrate into nearby surface water systems. During construction activities, impacts to surface waters in the area would be minimized by ensuring that BMPs are initiated and maintained to control erosion and sedimentation.

The Marshall Space Flight Center NSSC nomination stated minimal impact to potable water may occur, but no impact on groundwater quality would occur. A stormwater management plan approved by the State regulatory agencies would be required.

3.7.6 Soils and Geology

3.7.6.1 *Affected Environment*

The Marshall Space Flight Center NSSC nomination indicated that the native soils in the proposed area are of the Decatur – Cumberland – Abernathy Association. The area is located within the Interior Low Plateau Physiographic Province of Madison County. Two sinkholes were located at the northern edge of the wooded area in the southeast corner of the proposed property. No other prominent geological features were noted.

3.7.6.2 *Environmental Consequences*

The Marshall Space Flight Center NSSC nomination stated soils would not be impacted. Once constructed, the NSSC would not have any impact in terms of wind or water erosion of soils since soil would not be exposed. The entire site would consist either of impervious surfaces or landscaping. Topography and ground surface relief features would not be changed substantially, and regional and local drainage patterns would not be altered.

Soil or groundwater contamination has not been documented in this area. The City uses due diligence when purchasing property. The City of Huntsville typically performs an initial baseline environmental site assessment for property they want to purchase, but the property in question was purchased before 1990 before due diligence practices were introduced.⁷² NASA, therefore, conducted a Level 1 Environmental Assessment in October 2004 and found no evidence of contamination.

⁷² Communication with Mr. Scott Cardno, Senior Environmental Specialist, City of Huntsville.

3.7.7 Biological Resources

3.7.7.1 Affected Environment

At this site, if threatened or endangered species or other protected species are discovered, or candidate species become listed as threatened or endangered, NASA will consult with the U.S. Fish and Wildlife Service in accordance with the applicable statutes and regulations.

The Wheeler National Wildlife Refuge is located in Madison County and consists of approximately 13,800 ha (34,500 ac). The refuge was originally created as a safety place for geese and ducks; however, other species at the refuge include mammals, birds, fish, reptiles, and amphibians. The proposed NSSC site at CRP and the CRP are not located in or near the Refuge. The NSSC site is an open grassy area.

3.7.7.2 Environmental Consequences

Environmental information provided in the Marshall Space Flight Center nomination stated protected species would not be impacted.

NASA would take all available steps to prevent introduction of non-native or inappropriate vegetation species that may invade and degrade surrounding habitat for native vegetation species. Landscape maintenance activities would be carefully monitored via the facilities' EMS to ensure that the existing vegetation and the natural community composition and structure are not degraded. Impacts to the area would be avoided or minimized by facility design and siting to maintain native vegetation.

3.7.8 Ecological Resources

3.7.8.1 Affected Environment

Environmental information provided in the Marshall Space Flight Center NSSC nomination stated that the proposed NSSC site is located at the northwest corner of the intersection of Old Madison Pike and Research Park Boulevard and that the development of the NSSC would not affect wetlands or floodplains. Marshall Space Flight Center stated no wetlands occur within the proposed NSSC site and the site is not located in a floodplain or coastal zone.

3.7.8.2 Environmental Consequences

Wetlands and floodplains would not be impacted.

3.7.9 Cultural and Historic Resources

3.7.9.1 Affected Environment

NASA is required to comply with the National Historic Preservation Act of 1966, as amended. The Marshall Space Flight Center NSSC nomination stated historic resources would not be impacted. The proposed site is a grassy field that was previously a small farm. The site is cleared and no historic structures were observed on-site or in the vicinity based on the aerial photo. NASA contacted the SHPO in September 2004 and submitted an Application for Site Clearance. The SHPO Alabama Historical Commission officer determined that “there are five known archaeological sites adjacent to the project site...which makes the project area have a high probability for the location of archaeological resources.” The SHPO requested that a professional archaeologist conduct a cultural resource assessment for the undisturbed portions of the project area.⁷³ NASA conducted a cultural resources survey in November 2004, which indicated no historic or archaeological resources were present or likely to be impacted.⁷⁴

3.7.9.2 Environmental Consequences

The Alabama SHPO in a letter dated December 15, 2004, indicated that proposed action would have no effect on any known cultural resources.⁷⁵

Should archeological materials be discovered during the site survey or excavation, construction would stop and NASA would consult with the SHPO to determine the status of the materials. Depending on that decision, NASA may also determine mitigation that could include recovery of archeological materials and information, curation of the materials at an appropriate facility, and public education display at the new facility or nearby.

3.7.10 Environmental Justice

3.7.10.1 Affected Environment

Workforce diversity, local transportation access, access by other NASA Centers, and safe and healthful working conditions were criteria considered in each nomination. Each nomination considered opportunities for further employee development in the vicinity of the proposed NSSC and opportunities for partnering with local educational institutions, including minority institutions.

According to the Marshall Space Flight Center NSSC nomination, development of the NSSC would not have disproportionately high and adverse human health or environmental effects on

⁷³ Alabama Historical Commission letter dated October 1, 2004

⁷⁴ Brockington and Associates, Inc., Phase 1 Cultural Resources Survey of the Proposed NASA Shared Services Center (NSSC) at Cummings Research Park, Huntsville, Madison County, Alabama (November 2004).

⁷⁵ Alabama Historical Commission letter dated December 15, 2004

environmental justice populations. No adverse impacts on the health and safety of children would occur. Suitable access and facilities would be provided for staff and visitors with handicapping conditions.

The affected environment was expanded beyond the 16 km (10 mi) radius up to an 80 km (50 mi) radius, within commuting distance from the proposed site. The NSSC labor pool may be drawn from this entire area.

3.7.10.2 Environmental Consequences

Using LandView 6 (2004) software, merged selected databases from the EPA and USGS, and DOC Census Bureau TIGER files from the 2000 Census; to assess socioeconomic and other relevant environmental justice factors, NASA evaluated 2000 census data for Marshall Space Flight Center and vicinity up to a 80 km (50 mi) area. This radius defined the area from which the NSSC labor pool could be drawn.

Figure 3-21 shows there is a diversified white and minority population that will serve as the labor pool for the proposed NSSC.

Other relevant socio-economic data to achieving environmental justice goals include the percentage with graduate degrees and above and median household income. Figure 3-22 shows the population with advanced education degrees by census tracts, and indicates that the education level will provide opportunities for both blue collar and white-collar jobs to become available at the NSSC.

Figure 3-23 shows the household income distribution, and indicates a sufficiently diverse distribution of income.

Figure 3-24 shows equitable distribution of transportation, mobility, and access to the NSSC, if developed at the Marshall Space Flight Center site.

NSSC would develop an NSSC-specific environmental justice strategy or apply the strategy of the host or nearby NASA Center.

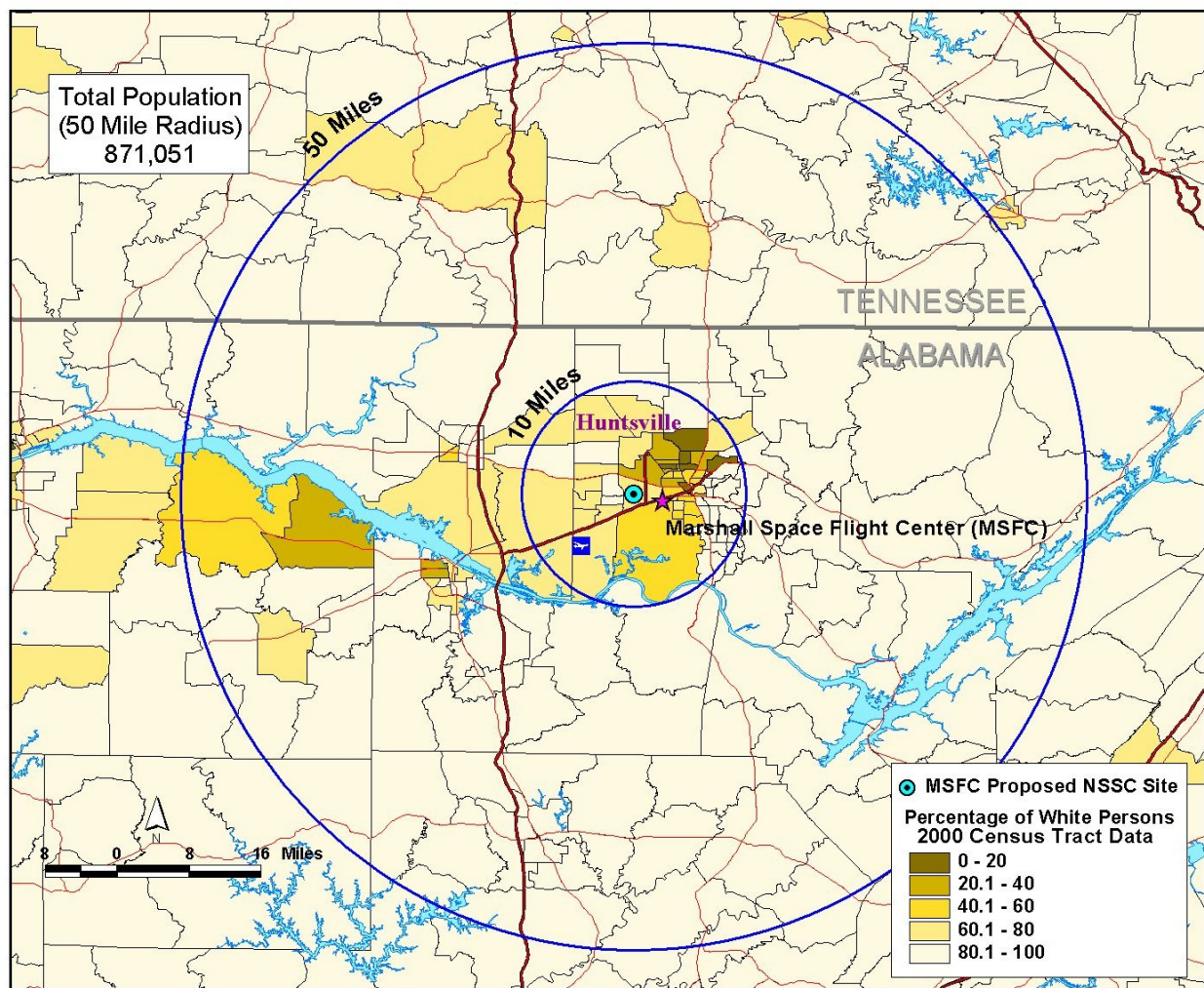


Figure 3-21. Cummings Research Park (A.4.4) 2000 Census Data - Percentage of White Persons

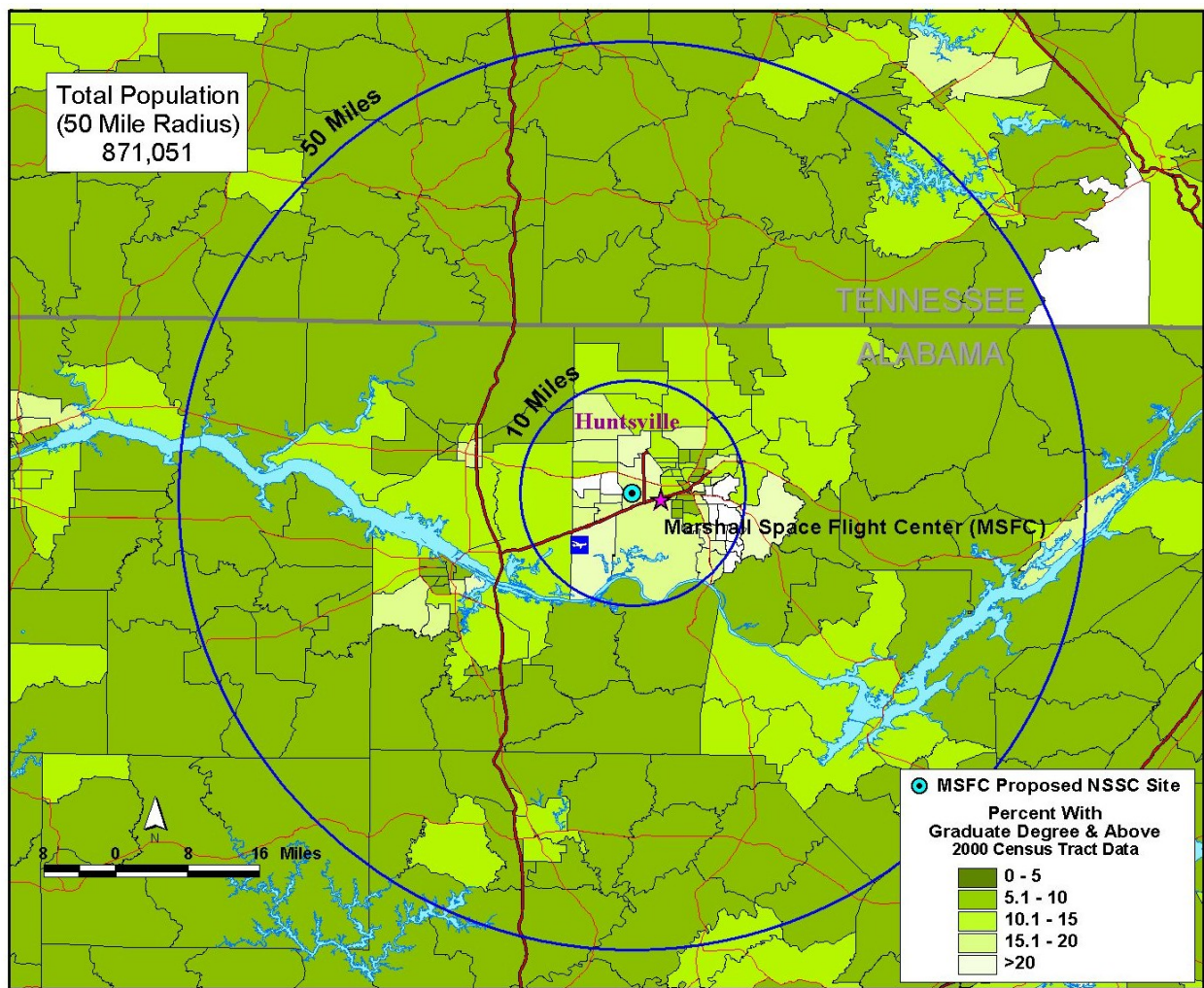


Figure 3-22. Cummings Research Park (A.4.4) 2000 Census Data - Percent with Graduate Degree and Above

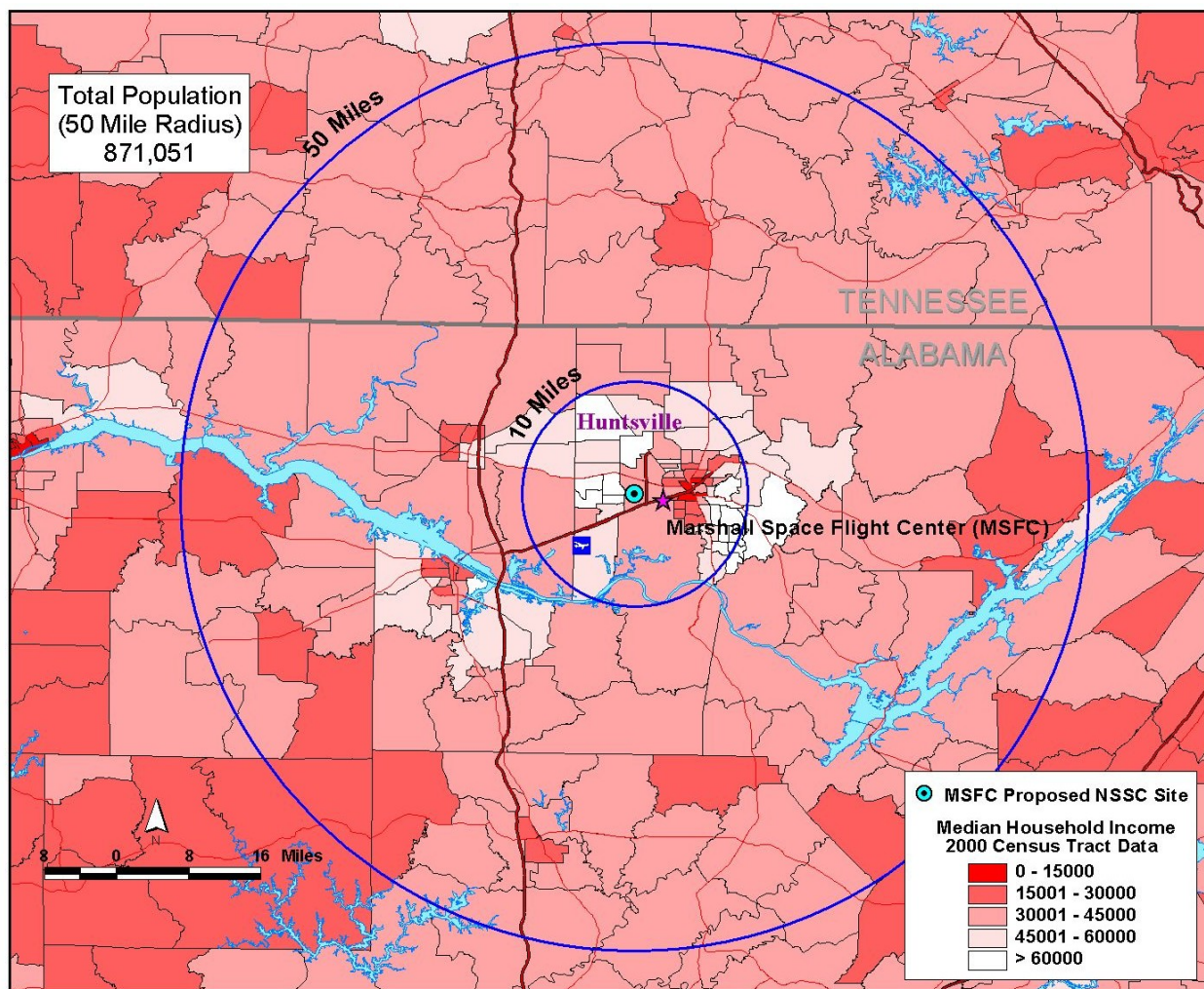


Figure 3-23. Cummings Research Park (A.4.4) 2000 Census Data - Median Household Income

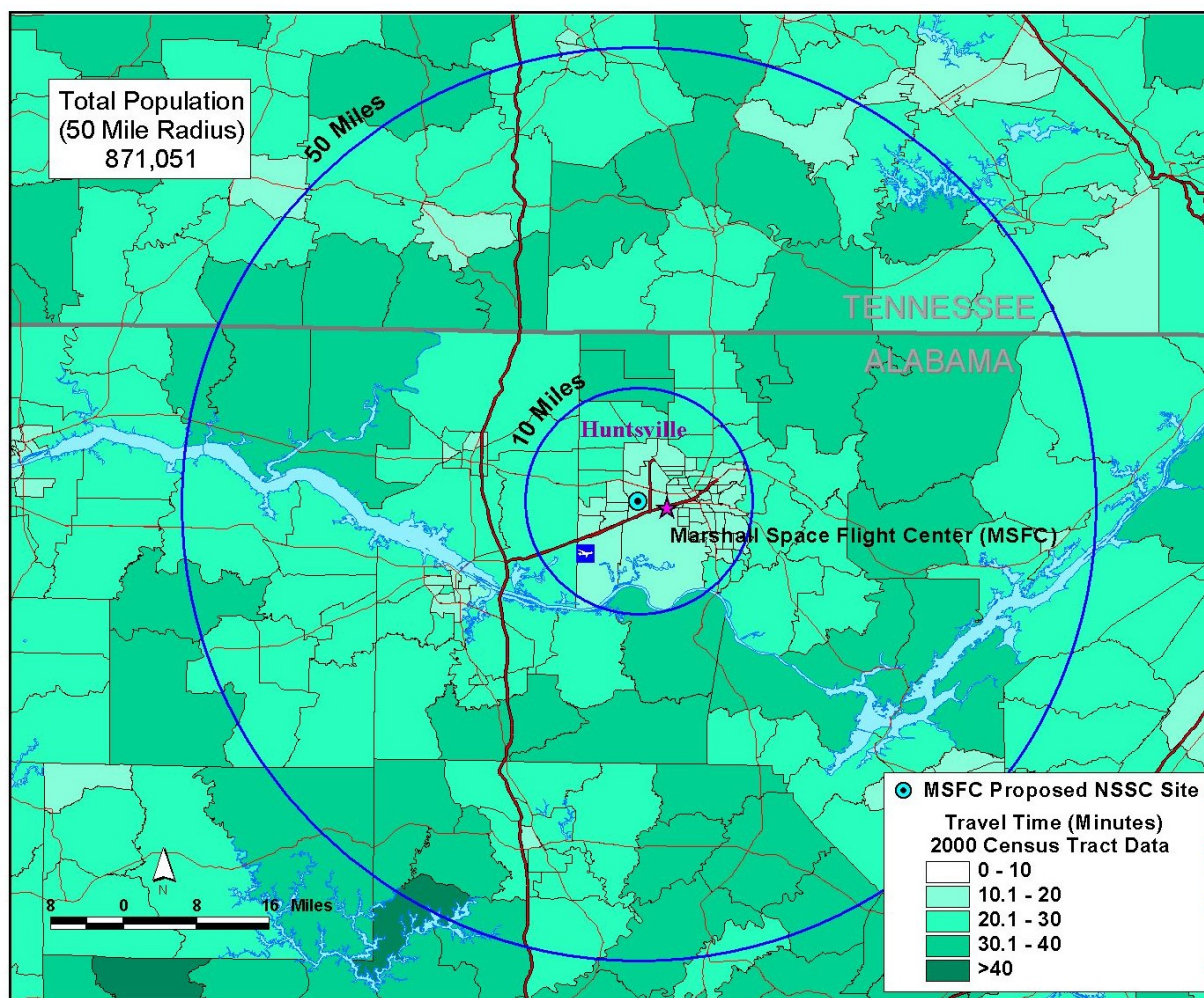


Figure 3-24. Cummings Research Park (A.4.4) 2000 Census Data - Travel Time in Minutes

Development of the proposed NSSC would not have disproportionately high and adverse human health or environmental effects on environmental justice populations or on the health and safety of children. Suitable handicap access and facilities would be provided for staff and visitors.

The NSSC would develop its own environmental justice strategy or apply the strategy of the host or nearby NASA Center.

3.8 ALTERNATIVE B: VIRTUAL CONSOLIDATION

Under the action alternative of creating a virtual NSSC, all activities would take place virtually.

- *Transportation and Traffic:* No impact or alteration of any current transportation systems of any localities would occur.
- *Solid and Hazardous Waste Generation and Management:* Additional solid waste or hazardous waste would not be generated.
- *Public Services and Utilities:* Required utilities and public services would be provided through the NASA Centers where there are infrastructure and public services. The impact at any one NASA Center would be slight.
- *Communication:* Impacts on local service providers or the environment provided by existing NASA Centers are not anticipated.
- *Land Use:* Other than some potential minor modifications to facilities and relocation of personnel; no land use or trends would change.
- *Noise:* Activities would occur in existing facilities with slight if any modification, and any noise levels would be within acceptable limits.
- *Air Quality:* No impact on air quality would occur since no new construction would be required and changes in personnel and transportation would be minimal.
- *Water Resources:* No impact on groundwater quality would occur since no new central location would be created requiring the hiring or re-location of new employees, or construction or major modification of a facility or roads. A virtual NSSC would not cause new impacts to surface water quality and would not impact existing use of water supplies at NASA facilities.
- *Soils and Geology:* No impact on geology and soils since no construction activities would occur.
- *Biological Resources:* No impacts to wildlife, plants, threatened and endangered species, or critical habitat would occur. Vegetation would not need to be cleared for construction of a new facility.
- *Ecological Resources:* No impacts on wetlands, floodplains, or coastal resources would occur.
- *Cultural and Historic Resources:* No impact on cultural or historic resources would occur.
- *Environmental Justice:* No disproportionately high impacts on environmental justice populations or children would occur.

3.9 ALTERNATIVE C: NO ACTION ALTERNATIVE

Under the No Action alternative, the impacts would be as follows:

- *Transportation and Traffic:* No impact on or alteration to any current transportation systems or local traffic of any localities.
- *Solid and Hazardous Waste Generation and Management:* No additional solid or hazardous waste generated.
- *Public Services and Utilities:* Changes in public services and utilities offered would not occur.
- *Communication:* No substantial change or impact to communication services would occur.
- *Land use:* Current patterns and trends in land-use would remain unchanged.
- *Noise:* Current noise levels at existing NASA facilities would remain unchanged.
- *Air Quality:* Current levels of air quality would remain unchanged.
- *Water Resources:* Groundwater quality, potable water, and surface water quality would not be impacted.
- *Soils and Geology:* Geology and soils would not be impacted.
- *Biological Resources:* No additional impacts on existing vegetation, existing wildlife, threatened and endangered species, or critical habitat would occur.
- *Ecological Resources:* Current patterns and trends in land-use would remain unchanged and there would be no new impacts on wetlands and floodplains. Current patterns and trends in land-use would remain unchanged and there would be no new impacts on coastal resources.
- *Cultural and Historic Resources:* No impact on cultural or historic resources would occur.
- *Environmental Justice:* No disproportionately high impacts on environmental justice populations or children would occur.

3.10 FINDINGS AND CONCLUSIONS

On the basis of the EA Phase 2, NASA has determined that it is reasonably foreseeable that the environmental impacts associated with any of the three alternatives are negligible or can be easily prevented and mitigated (Table 3-1).

3.10.1 Alternative A (Proposed Action and Preferred Alternative)

Issues commonly associated with construction or modification and operation of a mid-size office building include air emissions from site clearing and construction; noise during construction and operation; impacts to cultural resources, stormwater drainage, wetlands, floodplains, and wildlife due to site clearing, excavation, and increased traffic and other human activity; aesthetic or other impacts to historic properties; and changes in local traffic patterns and levels.

All nominations were required to include a completed NASA Environmental Checklist and draft Record of Environmental Consideration (REC). For all new construction alternatives at existing Centers, NASA reviewed environmental baseline information and other relevant information. For those alternatives requiring construction of new facilities off-Center, NASA reviewed information from Federal, State, and local planning and environmental agencies and other relevant sources. Table 3-1 summarizes the key findings and indicates the planned mitigation. The findings presented here are limited to the three Alternative A sites being carried forward in the decisionmaking process.

None of the three alternatives to be carried forward under Alternative A would affect floodplains or the coastal zone. Under Alternative A, development of the NSSC at the Aerospace Technology Park site require a § 404 Clean Water Act wetlands permit, which is anticipated to result in wetlands mitigation off site comparable to mitigation required for the expansion of the adjacent Cleveland-Hopkins International Airport, but on a much smaller scale. All sites would comply with stormwater management plans and permits.

No Federally listed threatened or endangered species or critical habitat or Federally protected species would be affected under any Alternative. NASA would require, as a condition of a lease or contract, pre-construction surveys for migratory birds and the Indian bat at the Aerospace Technology Park site. If the presence of these species is indicated, NASA would consult with the U.S. Fish and Wildlife Service. Mitigation may include adjusting the construction schedule. At any of the sites, if threatened or endangered species or other protected species are discovered during construction, NASA would consult with the U.S. Fish and Wildlife Service in accordance with applicable statutes and regulations.

Traffic and associated air quality impacts are expected to be minimal due to site locations near major arterials and the availability of traffic management options. NASA would require that precautions be taken to minimize dust and noise impacts at all sites.

Level/Phase 1 Site Assessments for contamination were completed at the Cummings Research Park site and an extensive Center-wide survey was conducted at NASA Stennis Space Center. None of these assessments indicated that contamination was likely or that a Level 2 Site Assessment would be needed. Based on current information available to NASA, contamination is also not anticipated at the Aerospace Technology Park site, but NASA as a condition of a lease or contract, require completion of a confirmatory Level 1 Site Assessment and if contamination

requiring remediation is discovered at a site as a result of the Level 1 Site Assessment or during construction, development and implementation of a remediation plan.

Cultural resources surveys have been completed for the Cummings Research Park site and NASA Stennis Space Center and the proposed action would not affect cultural resources at or in the vicinity of those sites. Based on current information available for the Aerospace Technology Park site and surrounding areas, no historic structures would be affected and NASA does not anticipate the presence of major archeological resources, but as a condition of a lease or contract would require confirmatory test borings for archeological resources as recommended by the Ohio State Historic Preservation Office. If archaeological resources are discovered at a site prior to construction, NASA would consult with the Ohio State Historic Preservation Office. A mitigation plan may be required. As a condition of a contract or lease, NASA would require that if unanticipated discovery occurs during construction at any of the three sites, construction would cease and NASA would consult with the respective State Historic Preservation Officer and mitigation may be required. A mitigation plan may include adjusting the footprint, phasing construction, recovering data, curating artifacts, and providing the public with information about the site's history.

The Proposed Action would not result in disproportionately high and adverse environmental impacts on minority or low-income populations or affect children's environmental health or safety at any of the proposed sites. NASA would develop an environmental justice strategy for the NSSC or apply the strategy of the host or nearby NASA Center.

NASA would also develop an NSSC-specific EMS or apply the EMS of the host or nearby NASA Center.

Thus, the location and operation of the NSSC at any of the three sites (NASA Stennis Space Center, Aerospace Technology Park, and Cummings Research Park) proposed for further consideration in the decisionmaking process as of NASA's January 7, 2005 announcement would meet the purpose and need of the NSSC and would not result in substantial direct, indirect, or cumulative environmental impacts.

3.10.2 Alternative B (Virtual Consolidation)

Under Alternative B, NASA would consolidate functions in a virtual environment without co-locating employees and contractors to a new location. NASA would relocate some personnel and equipment among existing Centers and require minor upgrades in facilities and equipment at existing Centers. Virtual consolidation, however, is unlikely to result in substantial direct, indirect, or cumulative environmental impacts not covered under existing Center permits and environmental reviews. In specific instances, and depending upon the circumstances, minor modifications of a facility at a Center could result in additional environmental review and permitting. NASA would continue to implement Center EMSs to prevent any potentially adverse impacts during operation of a Virtual NSSC. Alternative B would not fully meet the purpose and need for the NSSC.

3.10.3 Alternative C (No Action Alternative)

Under the No Action Alternative, NASA would not create an NSSC but may continue to relocate personnel and equipment among existing Centers and require minor upgrades in facilities and equipment at existing Centers as part of its on-going effort to improve efficiency and performance of its administrative operations. Such efforts are unlikely to result in substantial direct, indirect, or cumulative environmental impacts that are not covered under existing Center permits and environmental reviews. However, in specific instances, and depending upon the circumstances, minor modifications of a facility at a Center could result in additional environmental review and permitting. NASA would continue to implement Center EMSs to prevent any potentially adverse impacts during on-going operations. The No Action Alternative would not meet the purpose and need for the NSSC.

Table 3-1. Summary of Potential Environmental Impacts of Alternatives A, B, and C (mitigation indicated in footnotes)

Resource ⁷⁶	Alternative A: Consolidation						Alternative B: Virtual Consolidation	Alternative C: No Action
	A.2.1 NASA Johnson Space Center	A.2.2 NASA Stennis Space Center	A.4.1 Aerospace Technology Park (by GRC)	A.4.2 Central Florida Research Park (CFRP) by KSC)	A.4.3 City Center at Oyster Point (by LaRC)	A.4.4 Cummings Research Park (CRP) (by MSFC)		
NSSC Location	Clear Lake, TX	Hancock County, MS	Brook Park, OH	Orlando, FL	Newport News, VA	Huntsville, AL		
Construction Required ⁷⁷	Yes, on-site	Yes, on-site	Yes, off-site	Yes, off-site	Yes, off-site	Yes, off-site	No	No
Transportation and Traffic	Low impact	Low impact	Low impact	Low impact	Low impact	Low impact	No impact	No impact

⁷⁶ Alternative A: NASA NSSC Environmental Management System to be developed and full- or part-time NASA NSSC Environmental Manager to be designated. Alternatives B and C: Current NASA Center EMS would apply.

⁷⁷ Alternative A: All nominations required consistency with NASA's sustainable facilities policy.

Phase 2 Environmental Assessment – NASA Shared Services Center

Resource ⁷⁶	Alternative A: Consolidation						Alternative B: Virtual Consolidation	Alternative C: No Action
	A.2.1 NASA Johnson Space Center	A.2.2 NASA Stennis Space Center	A.4.1 Aerospace Technology Park (by GRC)	A.4.2 Central Florida Research Park (CFRP) by KSC)	A.4.3 City Center at Oyster Point (by LaRC)	A.4.4 Cummings Research Park (CRP) (by MSFC)		
Solid and Hazardous Waste	Low to no impact ⁷⁸	Low to no impact ⁷⁹	Low to no impact ⁸⁰	Low to no impact ⁸¹	Low to no impact ⁸²	Low to no impact ⁸³	No impact	No impact
Public Services and Utilities ⁸⁴	Low to no impact	Low to no impact	Low to no impact	Low to no impact	Low to no impact.	Low to no impact	Low to no impact	No impact

⁷⁸ No Level 1 Site Assessment. Available information does not indicate contamination likely. Confirmatory Environmental Site Assessment for contamination required prior to lease or contract.

⁷⁹ Center-wide survey completed. No contamination indicated at the proposed site. State of Mississippi concurred.

⁸⁰ No Level/Phase 1 Site Assessment. Available information does not indicate contamination likely. Confirmatory Environmental Site Assessment for contamination required as a condition of lease or contract.

⁸¹ No Level/Phase 1 Site Assessment. Available information does not indicate contamination likely. Confirmatory Environmental Site Assessment for contamination required as a condition of lease or contract.

⁸² Level/Phase 1 Site Assessment completed. Level 2 Site Assessment not indicated.

⁸³ Level/Phase 1 Site Assessment completed. Level 2 Site Assessment not indicated.

⁸⁴ Alternative A: NASA NSSC Energy Manager, full- or part-time, to be designated. Alternatives B and C: Current on-site NASA Center Energy Manager.

Phase 2 Environmental Assessment – NASA Shared Services Center

Resource ⁷⁶	Alternative A: Consolidation						Alternative B: Virtual Consolidation	Alternative C: No Action
	A.2.1 NASA Johnson Space Center	A.2.2 NASA Stennis Space Center	A.4.1 Aerospace Technology Park (by GRC)	A.4.2 Central Florida Research Park (CFRP) by KSC)	A.4.3 City Center at Oyster Point (by LaRC)	A.4.4 Cummings Research Park (CRP) (by MSFC)		
Communication	Low to no impact	Low to no impact	Low to no impact	Low to no impact	Low to no impact	Low to no impact	Low to no impact	No impact
Land Use	Low impact	Low impact	Low impact	Low impact	Low impact	Low impact	No impact	No impact
Noise	Low impact	Low impact	Low impact ⁸⁵	Low impact	Low impact	Low impact	No impact	No impact
Air Quality	Low to no impact ⁸⁶	Low to no impact	Low to no impact	Low to no impact	Low to no impact	Low to no impact	No impact	No impact
Water Resources	Low to no impact	Low to no impact	Low to no impact	Low to no impact ⁸⁷	Low to no impact	Low to no impact ⁸⁸	No impact	No impact

⁸⁵ Noise impacts from adjoining airport to be mitigated in accordance with occupational health and safety regulations and local noise codes.

⁸⁶ Confirmatory Clean Air Act General Conformity Determination (NOx and VOCs) may be required; construction scheduling adjustment and other mitigation may be required if results for relevant emissions exceed *de minimus* levels. Preliminary analysis indicated that levels would be well below *de minimus* levels.

Phase 2 Environmental Assessment – NASA Shared Services Center

Resource ⁷⁶	Alternative A: Consolidation						Alternative B: Virtual Consolidation	Alternative C: No Action
	A.2.1 NASA Johnson Space Center	A.2.2 NASA Stennis Space Center	A.4.1 Aerospace Technology Park (by GRC)	A.4.2 Central Florida Research Park (CFRP) by KSC)	A.4.3 City Center at Oyster Point (by LaRC)	A.4.4 Cummings Research Park (CRP) (by MSFC)		
Soils and Geology	Low to no impact	Low to no impact	Low to no impact	Low to no impact	Low to no impact	Low to no impact	No impact	No impact
Biological Resources ⁸⁹	Low to no impact ⁹⁰	Low to no impact	Low to no impact ⁹¹	Low to no impact	No impact	No impact	No impact	No impact
Ecological Resources	No impact	No impact	Wetlands impact to be mitigated ⁹²	No impact	No impact	No impact	No impact	No impact

⁸⁷ State Environmental Resources Permit required.

⁸⁸ State approved stormwater management plan required.

⁸⁹ All: If protected species are subsequently discovered on site or species on site are later designated for protection, NASA would consult with the U.S. Fish and Wildlife Service.

⁹⁰ Pre-construction survey required for migratory birds and, if results indicate presence, adjustment of construction schedule may be required.

⁹¹ Pre-construction survey required for migratory birds and Indiana bat and if results indicate presence, adjustment of construction schedule may be required.

⁹² Clean Water Act sec. 404 wetlands permit from the Army Corps of Engineers required; wetlands mitigation planned off-site.

Phase 2 Environmental Assessment – NASA Shared Services Center

Resource ⁷⁶	Alternative A: Consolidation						Alternative B: Virtual Consolidation	Alternative C: No Action
	A.2.1 NASA Johnson Space Center	A.2.2 NASA Stennis Space Center	A.4.1 Aerospace Technology Park (by GRC)	A.4.2 Central Florida Research Park (CFRP) by KSC)	A.4.3 City Center at Oyster Point (by LaRC)	A.4.4 Cummings Research Park (CRP) (by MSFC)		
Cultural and Historic Resources ⁹³	Low to no impact ⁹⁴	No impact	Low to no impact ⁹⁵	Low to no impact ⁹⁶	Low to no impact ⁹⁷	No impact	No impact	No impact

⁹³ Alternative A: If unanticipated discovery occurs during excavation or construction, consultation with SHPO would be required to develop mitigation plan if needed that may include adjustment of the footprint or construction schedule, data recovery, curation, and public education display.

Phase 2 Environmental Assessment – NASA Shared Services Center

Resource ⁷⁶	Alternative A: Consolidation						Alternative B: Virtual Consolidation	Alternative C: No Action
	A.2.1 NASA Johnson Space Center	A.2.2 NASA Stennis Space Center	A.4.1 Aerospace Technology Park (by GRC)	A.4.2 Central Florida Research Park (CFRP) by KSC)	A.4.3 City Center at Oyster Point (by LaRC)	A.4.4 Cummings Research Park (CRP) (by MSFC)		

⁹⁴ No impact to National Historic Landmarks at JSC. Confirmatory site testing for archeological resources may be required, and if results indicate presence, consultation with SHPO would be required to develop mitigation plan if needed that may include adjustment of the footprint or construction schedule, data recovery, curation, and public education display.

⁹⁵ As a condition of a lease or contract, NASA would require site testing for archeological resources as recommended by Ohio SHPO, and if results indicate presence, consultation with SHPO would be required. Mitigation plan, if needed, may include adjustment of the footprint or construction schedule, data recovery, curation, and public education display.

⁹⁶ Confirmatory site testing for archeological resources may be required, and if results indicate presence, consultation with SHPO would be required. Mitigation plan, if needed, may include adjustment of the footprint or construction schedule, data recovery, curation, and public education display.

⁹⁷ Confirmatory site testing for archeological resources may be required, and if results indicate presence, consultation with SHPO would be required. Mitigation plan, if needed, may include adjustment of the footprint or construction schedule, data recovery, curation, and public education display.

Phase 2 Environmental Assessment – NASA Shared Services Center

Resource ⁷⁶	Alternative A: Consolidation						Alternative B: Virtual Consolidation	Alternative C: No Action
	A.2.1 NASA Johnson Space Center	A.2.2 NASA Stennis Space Center	A.4.1 Aerospace Technology Park (by GRC)	A.4.2 Central Florida Research Park (CFRP) by KSC)	A.4.3 City Center at Oyster Point (by LaRC)	A.4.4 Cummings Research Park (CRP) (by MSFC)		
Environmental Justice ⁹⁸	No adverse impact	No adverse impact	No adverse impact	No adverse impact	No adverse impact	No adverse impact	No adverse impact	No adverse impact

⁹⁸ Alternative A: NASA NSSC EJ Strategy would be developed. Alternatives B and C: Current NASA Center EJ Strategy would apply.

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Phase 2 Environmental Assessment – NASA Shared Services Center

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