

**FINAL**

# **Environmental Assessment**

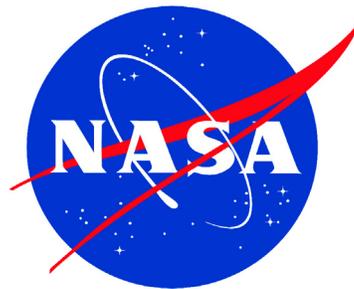
## **Marshall Exchange Retail Development Property Lease**

**at**

## **George C. Marshall Space Flight Center**

**Contract No. NNM10AA17C**

**Task Order No. CH442**



**National Aeronautics and Space Administration  
George C. Marshall Space Flight Center**

**Huntsville, Alabama**

**February 2012**

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Prepared for



**National Aeronautics and Space Administration**

George C. Marshall Space Flight Center  
Huntsville, Alabama

Prepared by

**CH2MHILL**

February 2012

# ***ENVIRONMENTAL ASSESSMENT***

***MARSHALL EXCHANGE RETAIL DEVELOPMENT PROPERTY  
LEASE AT GEORGE C. MARSHALL SPACE FLIGHT CENTER***

***NATIONAL AERONAUTICS AND SPACE ADMINISTRATION***

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# Environmental Assessment Organization

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This Environmental Assessment addresses the National Aeronautics and Space Administration's Proposed Action involving the Marshall Exchange Retail Development Property Lease at George C. Marshall Space Flight Center in Huntsville, Alabama. As required by 32 Code of Federal Regulations 651 and the National Environmental Policy Act, the potential effects of implementing this action are analyzed.

A *LIST OF ACRONYMS* is provided immediately following the Table of Contents.

**SECTION 1:**      *PURPOSE OF AND NEED FOR THE PROPOSED ACTION* provides an introduction and background, summarizes the purpose of and need for the Proposed Action, discusses the scope of the document, and identifies the resources considered but eliminated from further analysis.

**SECTION 2:**      *DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES* describes the Proposed Action and the alternatives to the Proposed Action.

**SECTION 3:**      *AFFECTED ENVIRONMENT* describes the existing conditions of each resource for which the Proposed Action and alternatives to the Proposed Action are evaluated.

**SECTION 4:**      *ENVIRONMENTAL CONSEQUENCES* presents the potential effects of implementing the Proposed Action and alternatives to the Proposed Action on the resources described in Section 3.

**SECTION 5:**      *SUMMARY OF ENVIRONMENTAL CONSEQUENCES AND CONCLUSIONS* presents a tabulated summary of the potential consequences of the Proposed Action and No-Action Alternative and also presents the conclusions of the Environmental Assessment.

**SECTION 6:**      *REFERENCES* presents bibliographical information about the sources used to prepare the Environmental Assessment.

**SECTION 7:**      *LIST OF PREPARERS* provides information about the persons who prepared the Environmental Assessment

**APPENDIXES**    **A** MSFC Director Authorization of Property Lease

**B** Public Involvement

**C** Regulatory Agency Correspondence

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# Acronyms

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|                 |   |
|-----------------|---|
| ACM             | asbestos containing material  |
| ADEM            | Alabama Department of Environmental Management                        |
| AST             | aboveground storage tank  |
| bls             | below land surface  |
| BMP             | best management practice  |
| CAA             | Clean Air Act   |
| CBMPP           | Construction Best Management Practices Plan                           |
| CERCLA          | Comprehensive Environmental Response, Compensation, and Liability Act |
| CEQ             | Council on Environmental Quality                                      |
| CFR             | Code of Federal Regulations   |
| CO <sub>2</sub> | carbon dioxide  |
| CTC             | carbon tetrachloride,   |
| CVOC            | chlorinated volatile organic compound                                 |
| dB              | decibel   |
| dBA             | A-weighted decibel scale  |
| EA              | Environmental Assessment  |
| EAC             | Environmental Access Control  |
| EEOH            | Environmental Engineering and Occupational Health                     |
| EHS             | Extremely Hazardous Substance   |
| EISA            | Energy Independence and Security Act                                  |
| EO              | Executive Order   |
| ESA             | Ecologically Sensitive Area   |
| ESC             | Environmental Support Contractor                                      |
| ft              | feet  |
| FY              | Fiscal Year   |
| HMA             | Huntsville Metropolitan Area  |
| HWSF            | Hazardous Waste Storage Facility                                      |
| ICRMP           | Integrated Cultural Resources Management Plan                         |
| kV              | kilovolt  |
| lb              | pound   |
| LBP             | lead-based paint  |
| Ldn             | day-night averaged sound level  |
| LEED            | Leadership in Energy & Environmental Design                           |
| LID             | Low Impact Development  |
| MEC             | Munitions and Explosives of Concern                                   |
| MMRP            | Military Munitions Response Program                                   |
| MSFC            | George C. Marshall Space Flight Center                                |
| msl             | mean sea level  |

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|        |   |
|--------|---|
| NAAQS  | National Ambient Air Quality Standards          |
| NASA   | National Aeronautics and Space Administration   |
| NEPA   | National Environmental Policy Act               |
| NPDES  | National Pollutant Discharge Elimination System |
| NRHP   | National Register of Historic Places            |
| NRMP   | Natural Resources Management Plan               |
| OSHA   | Occupational Safety and Health Administration   |
| OU     | Operable Unit                                   |
| PCB    | polychlorinated biphenyl                        |
| PCE    | tetrachloroethene                               |
| QD     | Quantity Distance                               |
| RCRA   | Resource Conservation and Recovery Act          |
| RI     | Remedial Investigation                          |
| RSA    | Redstone Arsenal                                |
| SOP    | Standard Operating Procedure                    |
| SHPO   | State Historic Preservation Office              |
| TCE    | trichloroethene                                 |
| TVA    | Tennessee Valley Authority                      |
| U.S.C. | United States Code                              |
| USEPA  | U.S. Environmental Protection Agency            |
| UST    | underground storage tank                        |

# Purpose of and Need for the Proposed Action

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## 1.1 Introduction

The National Aeronautics and Space Administration (NASA) Exchange – Marshall Space Flight Center (MSFC), more commonly referred to as the Marshall Exchange, plans to provide retail developers an opportunity to lease federal land controlled by NASA’s MSFC to provide food and other convenience services for the workforce of MSFC and surrounding Redstone Arsenal (RSA), and to generate non-appropriated funding that would enable the Marshall Exchange to continue to provide morale, welfare, and recreational activities and events for the well being of MSFC employees. The proposed lease property is approximately 25.68 acres based on its right-of-way boundaries and has no planned NASA mission use.

This Environmental Assessment (EA) has been prepared in compliance with the National Environmental Policy Act of 1969 (NEPA), as amended (42 United States Code [U.S.C.] 4321 et seq.), the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 *Code of Federal Regulations* [CFR] Parts 1500 through 1508), and NASA regulations (14 CFR Part 1216 Subpart 1216.3). The outline and content of this EA are consistent with NASA Procedural Requirements 8580.1 for implementing NEPA and Executive Order (EO) 12114 (NASA, 2001).

## 1.2 Background

The Marshall Exchange is an instrumentality of the United States that operates under the authority of NASA. The purpose of the Marshall Exchange is to generate revenue from vending, concessionaires, and gift shop/retail sales to provide morale, welfare, and recreational activities and events for the well being of MSFC employees. The Marshall Exchange generally operates with non-appropriated (non-taxpayer) funding. A Center Director may authorize the use of NASA-controlled real property and existing facilities for Exchange operations, provided that such use does not interfere with official business or involve activities with the potential to release hazardous substances to the environment for which NASA (as the real property owner) is ultimately liable. Accordingly, the MSFC Director has authorized the leasing and retail development of the subject property for Marshall Exchange operations (Appendix A).

MSFC is located on the U.S. Army’s RSA. NASA leases the land that is occupied by MSFC from the U.S. Army through a 99-year ground lease, dated July 1, 1960. NASA has irrevocable use and occupancy rights to the land and facilities within MSFC; however, the Army retains the right of access to all major utility lines, rail tracks, and main roads for applicable operations and maintenance. The MSFC ground lease, which has 47 remaining years, includes renewal and sub-lease/assignment options. The proposed lease of the subject property by the Marshall Exchange is consistent with property sub-lease options allowed under the MSFC ground lease.

## 1.3 Purpose and Need

The purpose of the Proposed Action is to provide onsite food/convenience services, improve the quality of work life, and reduce employee time away from work for the workforce of MSFC and RSA, and to generate revenue for the Marshall Exchange through the leasing and retail development of the subject property. Constraints on federal spending have significantly reduced NASA's ability to construct non-mission related facilities, including cafeterias and facilities for concessionaire operations. The proposed development of the subject property would potentially include full service restaurants, fast food restaurants, a gas station, a car wash, a credit union/bank, County license department, and retail stores such as dry cleaners, printing/photo shops, gift shops, and a shipping store (UPS/FedEx). At present, MSFC and the surrounding workforce has very limited food service offerings due to the lack of appropriated funding for full service cafeterias. Locating fast food and full service restaurants on the subject property would provide easily accessible food services for the occupants of three new buildings that have recently been constructed immediately adjacent to the eastern side of the property. At present, there are no food services near these buildings, which combined would have a total occupancy of more than 1,100 people. A cafeteria initially planned for the new buildings was cancelled due to higher than expected construction costs of the new buildings.

The food services that would be provided on the subject property would also offset the projected future decrease in food services elsewhere on MSFC. Two of MSFC's four cafeterias are proposed to be demolished within the next four years, which would leave available only the main cafeteria in Building 4203 and the cafeteria in Building 4708. Building 4203 is located in the northernmost part of MSFC and Building 4708 is located within a secured area that has restricted access. Due to their locations, these remaining cafeterias would not be conveniently accessible to the occupants of the newly constructed buildings, and alone would not adequately meet the food service needs of MSFC employees. The existing customer base for the proposed retail development includes the approximately 7,000 employees of MSFC as well as a large portion of RSA's employees/personnel located along Martin Road. The proposed widening of Martin Road (west of Rideout Road), which runs adjacent to the northern boundary of the subject property, by the end of 2012 is expected to substantially increase the customer base of the development. Additional customers for the proposed development is also expected to be provided by the new Army Materiel Command Headquarters building located on Martin Road just outside the eastern boundary of MSFC.

## 1.4 Scope of EA

This EA analyzes the potential environmental impacts of the leasing of MSFC property by the Marshall Exchange to a private developer. The potential environmental impacts that may result from the retail development of the property are also assessed by this EA to the extent allowable by the amount of information that is currently available on how the property may be developed. No information on the actual planning/design of the proposed development is yet available. Therefore, this EA assesses potential future development conditions and associated potential environmental impacts largely based on preliminary planning/design guidelines that have been prepared to date by MSFC for the development,

and other preliminary information. The actual development conditions and associated potential environmental impacts may differ significantly from those analyzed by this EA. Therefore, separate NEPA analysis and documentation will be required to provide a comprehensive and accurate assessment of the potential environmental impacts of the Proposed Action when information on the actual development planning and design is available.

The potential impacts of the Proposed Action are evaluated against those of the No-Action Alternative, under which the subject property would not be leased or developed. This EA does not address the planned demolition of Building 4614 within the subject property, the proposed widening of Martin Road adjacent to the subject property, or any other ancillary development that is proposed outside the boundaries of the subject property. The potential environmental impacts of those actions would be analyzed in separate NEPA documentation as appropriate.

## 1.5 Public and Agency Consultation

A 30-day public review was held from December 18, 2011 through January 16, 2012 to solicit public comments on the draft EA. The public review period was announced in a public notice that was published in the *Huntsville Times* newspaper out of Huntsville, Alabama. Copies of the draft EA were made available to the public during the review period at the NASA External Relations Office at MSFC and at two public libraries in the local area. A copy of the public notice that was published in the *Huntsville Times* newspaper is included in Appendix B. The draft EA was also coordinated with federal, state, and local entities through letter correspondence (Appendix C). All comments received are included in Appendix C and are addressed in pertinent sections of the EA.

## 1.6 Resources Considered but Eliminated From Further Analysis

NASA uses a systematic and interdisciplinary approach to ensure that all pertinent resources are analyzed and potential effects are identified. Using this approach, the Proposed Action was determined to have no potential to affect several resources. Therefore, these resources were eliminated from further analysis and discussion in this EA. Table 1-1 identifies the resources that were considered but eliminated from further analysis because they would have no potential to be affected by the Proposed Action.

**TABLE 1-1**

Resources Considered But Eliminated From Further Analysis  
*EA for the Marshall Exchange Retail Development Property Lease at MSFC*

| Resource                         | Rationale  |
|----------------------------------|--|
| Floodplains                      | The subject property is not located within the 100-year floodplain; therefore, development of the property would not displace floodplain. Operation of the retail services on the property would not involve any activity that would directly or indirectly affect floodplains. For these reasons, the Proposed Action would have no impact on floodplains.  |
| Wetlands                         | There are no wetlands within or in the vicinity of the subject property; therefore, development of the property would not directly impact wetlands. The private developer would be required to implement appropriate best management practices (BMPs) and erosion/sedimentation controls during the construction period to minimize potential indirect impacts to wetlands outside the property. Operation of the retail services on the property would not involve any activity that would directly or indirectly affect wetlands. For these reasons, the Proposed Action would have no impact on wetlands. |
| Housing, Schools, and Recreation | There are no housing, schools, or recreational areas within or in the vicinity of the subject property. Operation/management of the retail services on the property is expected to involve few, if any, permanent personnel relocations into the local area; therefore, the Proposed Action would not significantly increase the number of persons living in the local area. For these reasons, the Proposed Action would have no impact on housing, schools, or recreation.   |
| Rail and Water Transportation    | Construction and operation of the retail services on the subject property would not involve the use of rail or water transportation. There are no railroads or waterways within or in the vicinity of the subject property. For these reasons, the Proposed Action would have no impact on rail or water transportation.   |
| Aviation                         | Construction and operation of the retail services would not involve any mode of air transportation, and would not affect airspace or require coordination with airfield operations. Therefore, the Proposed Action would have no impact on aviation.   |

# Description of the Proposed Action and Alternatives

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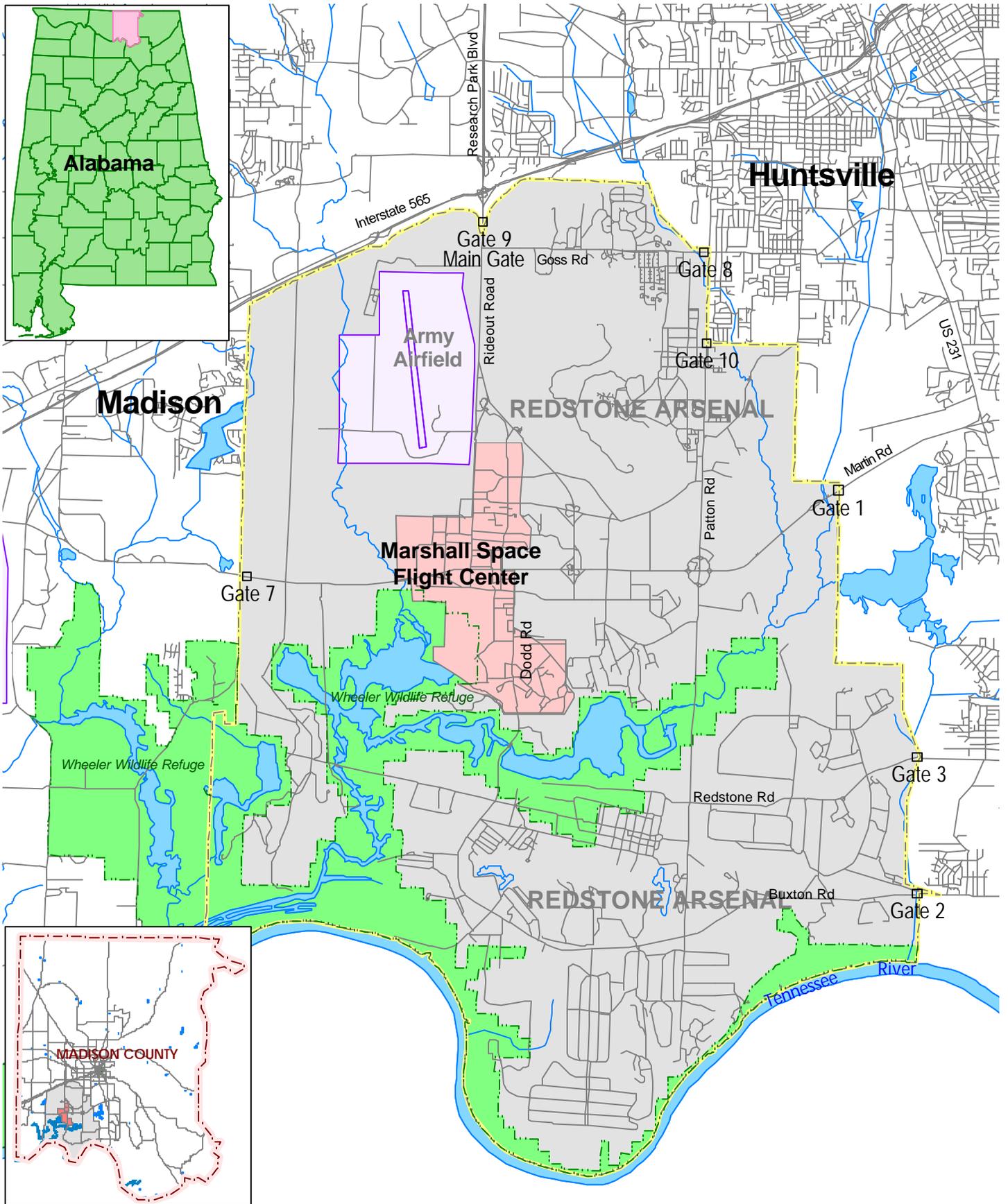
## 2.1 Description of the Proposed Action

The Proposed Action involves the leasing of a 25.68-acre parcel (as defined by the property's right-of-way boundaries) located on MSFC by the Marshall Exchange to a private developer. The leasing and privately-funded retail development of the property is intended to provide food and other convenience services for the workforce of MSFC and RSA, and to generate revenue for the Marshall Exchange, which has the mission of providing morale, welfare, and recreational activities and events for the well being of MSFC employees.

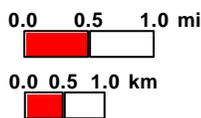
MSFC is located in north-central Alabama on approximately 1,841 acres of property within RSA (Figure 2-1). The property proposed to be leased is located in the west-central part of MSFC (Figure 2-2). It is bordered to the north by Martin Road, to the east by Gemini/Fowler Road, to the south by Centaur Street, and to the west by sparsely developed land (Figures 2-3 and 2-4). Building 4614 (Atmospheric Research Building), which is currently vacant, is located within the northeastern part of the property. A portion of Fowler Road also runs through the northeastern part of the property, south of Building 4614. The property consists mostly of upland forests and areas of mowed grass. Aboveground electrical lines run north/south through the western and central parts of the property and an aboveground steam line runs east/west through the southern part of the property. Underground utilities on the property include sanitary sewer, storm sewer, potable water, telecommunications, and natural gas.

There are three new buildings that have recently been constructed immediately adjacent to the eastern side of the property across Gemini/Fowler Road: Buildings 4600 and 4601, which are engineering-related office buildings, and Building 4602, which is a materials laboratory building (see Figure 2-4). Nearby existing buildings include Building 4622 (Center Activities Building), Building 4623 (Materials Combustion Research Facility), Building 4628 (Hydrogen Test Facility), and Building 4643 (Tribology Test Facility).

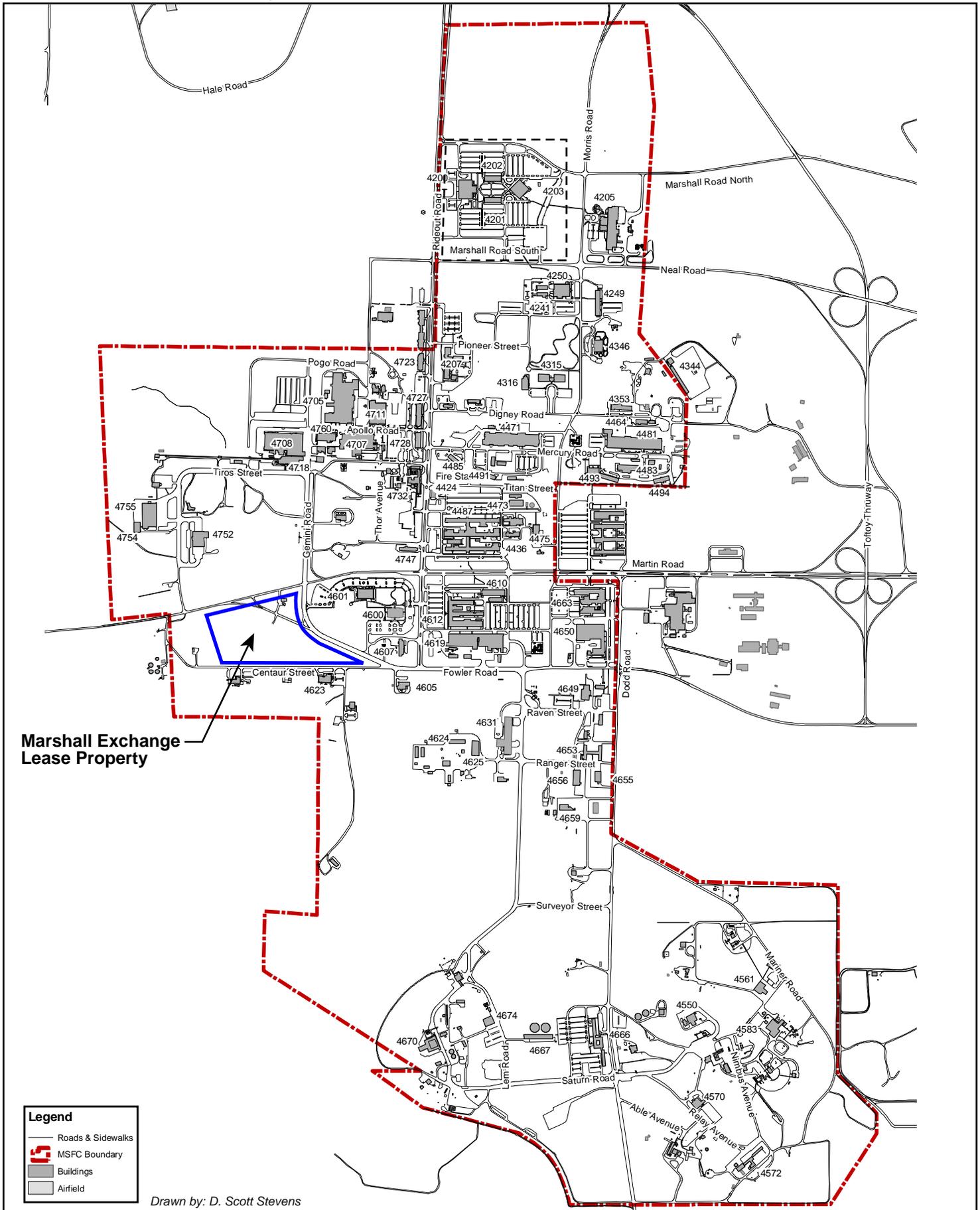
Under the Proposed Action, the Marshall Exchange would lease the subject property to a private developer that would be selected through a competitive selection process. The selected private developer would be fully responsible for all aspects of the retail development of the property, including all funding of the development. The selected developer would plan and design the development in accordance with guidelines prepared by the MSFC Facilities Management Office. Planning and design guidelines for the development, including the types of retail services permitted to be constructed and operated, are included in the Marshall Exchange's Notice of Lease but may be modified with approval by the MSFC Facilities Management Office. A private developer has not been selected and no planning/design of the retail development has been initiated to date.



Drawn by: D. Scott Stevens



**FIGURE 2-1**  
Marshall Space Flight Center  
Location and Vicinity Map



**Marshall Exchange Lease Property**

**Legend**

- Roads & Sidewalks
- MSFC Boundary
- Buildings
- Airfield

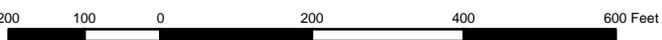
Drawn by: D. Scott Stevens



0 500 1,000 2,000 3,000 Feet

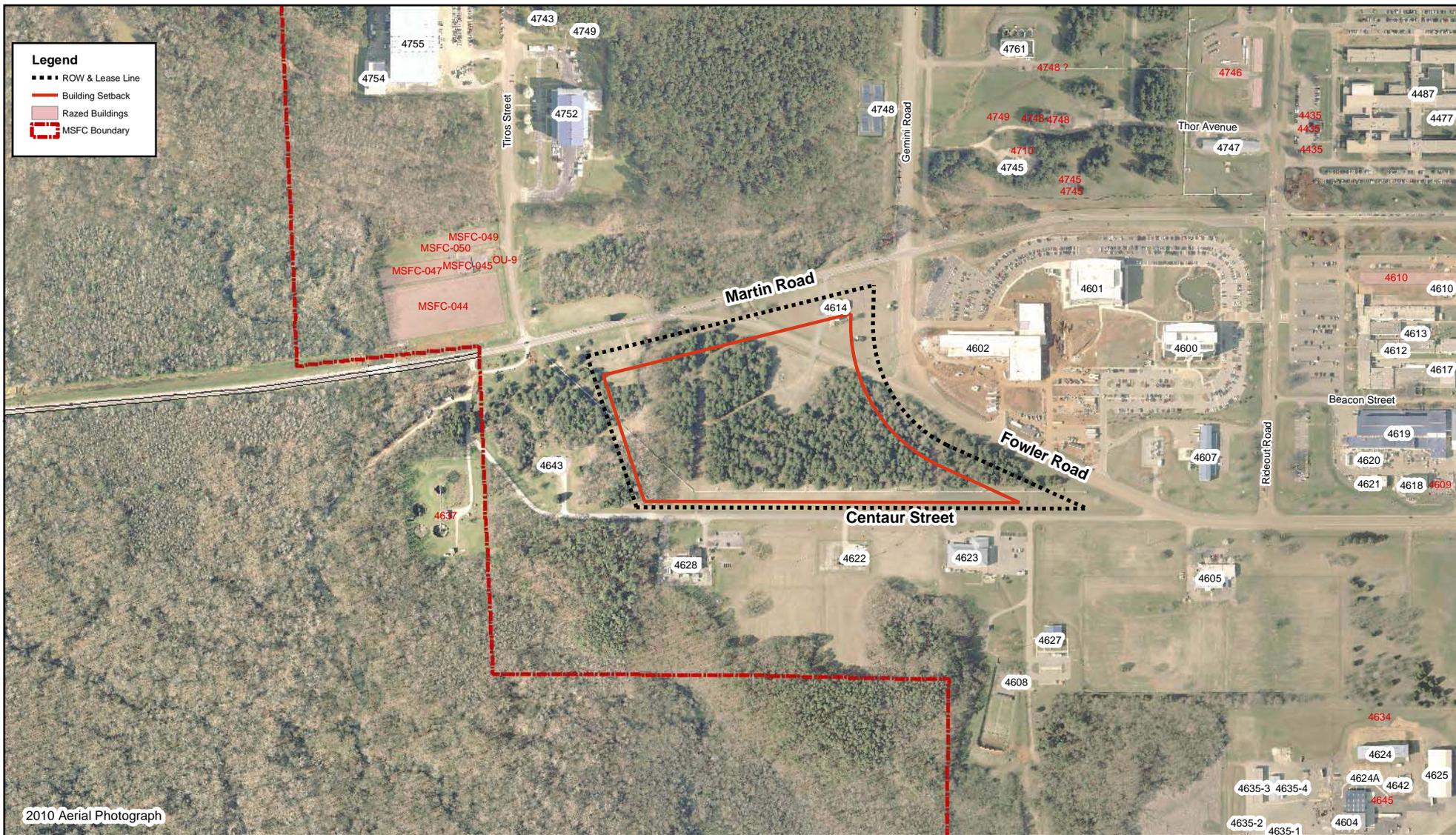
0 250 500 1,000 Meters

**FIGURE 2-2**  
Location of Marshall Exchange Lease Property

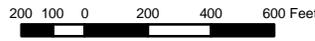


23-AUG-2011  
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**FIGURE 2-3**  
 Aerial Photograph of  
 Marshall Exchange Lease Property



2010 Aerial Photograph



25-AUG-2011  
 Drawn By:  
 D. Scott Stevens

**FIGURE 2-4**  
 Aerial Photograph of  
 Marshall Exchange Lease Property -  
 Expanded View

Given that no information on the actual planning/design of the development is yet available, this EA assesses potential future development conditions and associated potential environmental impacts largely based on the preliminary planning/design guidelines that have been prepared to date by MSFC, and other preliminary information. The actual development conditions and associated potential environmental impacts may differ significantly from those analyzed by this EA. As discussed in Section 1.4, separate NEPA analysis and documentation will be required to provide a comprehensive and accurate assessment of the potential environmental impacts of the Proposed Action when information on the actual development planning and design is available.

Based on the preliminary planning/design guidelines prepared by MSFC to date, the proposed development of the property would potentially include full service restaurants, fast food restaurants, a gas station, a car wash, a credit union/bank, and retail stores such as dry cleaners, printing/photo shops, gift shops, and a shipping store (UPS/FedEx). One access road that connects the property to Martin Road is expected to be constructed; additional access roads that connect the property to one or more of other adjacent roads may also be constructed. Martin Road is proposed to be widened to four lanes by the City of Huntsville by the end of 2012. The design for the widening of Martin Road is underway and the developer would be responsible for coordinating with the City of Huntsville on the property's access connection to the redesigned Martin Road. At this time, one new traffic light is proposed at the intersection of Gemini Road and Martin Road to facilitate access to the property; additional traffic lights may also be added. At this time, the portion of Fowler Road that runs through the northeastern part of the property is expected to be removed by the developer. Building 4614, located in the northeastern part of the property, is planned to be demolished by MSFC prior to the development of the property; the demolition of this building is not part of the Proposed Action.

Front buffer zones consisting of grass and landscape strips of specified widths would be required along all adjacent road frontages. The buildings and structures that would be constructed on the property would be required to have specified setback distances from the adjacent roads and from the western property line (see Figures 2-3 and 2-4). All buildings are currently planned to be a maximum of one story, and have a maximum eave height of 15 feet (ft) (4.6 meters) and a maximum building height (including roof) of 30 ft (9.1 meters). All structures are currently expected to be designed to meet energy efficiency standards, such as Leadership in Energy & Environmental Design (LEED). All buildings are currently planned to have a vapor barrier due to the contaminated groundwater beneath the property. At this time, it is not known how much of the existing vegetation on the property would be displaced by buildings, pavement, and landscaping. It is currently expected that the maximum total coverage of buildings on the property would be restricted to 40 percent of the property area and the maximum total coverage of buildings plus other pavement would be restricted to 80 percent of the property area.

## 2.2 Alternatives to the Proposed Action

Under NEPA and 32 CFR Part 989 – Environmental Impact Analysis Process, this EA is required to address the potential environmental impacts of the Proposed Action, No-Action Alternative, and “reasonable” alternatives to the Proposed Action. Reasonable alternatives

are those that meet the underlying purpose and need for the Proposed Action, are feasible from a technical and economic standpoint, and meet reasonable screening criteria (selection standards) that are suitable to a particular action. Screening criteria may include requirements or constraints associated with operational, technical, environmental, budgetary, and time factors. Alternatives that are determined to not be reasonable can be eliminated from detailed analysis in this EA.

### **2.2.1 Alternatives Eliminated from Detailed Analysis**

The leasing of other parcels of property at MSFC and development of the subject property by the Marshall Exchange itself were given consideration by NASA as potential alternatives to the Proposed Action. Two other parcels of property at MSFC were considered as potential alternative sites for leasing by the Marshall Exchange: a parcel located in the northernmost part of the Center and a parcel located in the northwestern part of the Center. The parcel located in the northernmost part of MSFC is part of an area referred to as the North Campus. This considered parcel consists of vacant land situated between the northern boundary of MSFC and the 4200 Complex, which is a complex of administrative and project/program management office buildings. Based on the 2003 MSFC 20-Year Facilities Master Plan, the entire North Campus, including the vacant parcel considered as an alternative lease site, is designated to support administrative and management functions for the foreseeable future (NASA, 2003). In addition to having an incompatible land-use designation, this parcel is far from the three new high-occupancy buildings that have recently been constructed on the eastern side of Gemini/Fowler Road. As discussed in Section 1.3, locating restaurants on the subject property under the Proposed Action would provide easily accessible food services for the occupants of these new buildings. Accessing restaurants on the parcel in the North Campus would not be as convenient for the occupants of these new buildings or for the occupants of the new Army Materiel Command Headquarters building on Martin Road. Moreover, the restaurants would be very close to MSFC's main cafeteria which is located in Building 4203 on the North Campus. For these reasons, this parcel is not a reasonable alternative site for leasing by the Marshall Exchange and is not carried forward for detailed analysis in this EA.

The parcel located in the northwestern part of MSFC is part of an area referred to as the Research and Development Support Area. This considered parcel consists of vacant land situated between the northwestern boundary of MSFC and industrial-type facilities that support research and technology development, including high-bay assembly and manufacturing buildings. This parcel is relatively secluded and not visible from any major roadways. Based on the 2003 MSFC 20-Year Facilities Master Plan, this parcel is designated to support technology development and assembly/manufacturing functions for the foreseeable future (NASA, 2003). In addition to having an incompatible land-use designation, this parcel is not in close proximity to the three newly constructed buildings on the eastern side of Gemini/Fowler Road or the new Army Materiel Command Headquarters building on Martin Road, although it is not as far from the buildings as the parcel on the North Campus. This parcel's secluded location and distance from major roadways are of greater significance because they would not provide the high visibility desired for the proposed dining and retail services. For these reasons, this parcel is not a reasonable alternative site for leasing by the Marshall Exchange and is not carried forward for detailed analysis in this EA.

Lastly, development of the subject property by the Marshall Exchange itself was considered as a potential alternative to leasing the site to a private developer. This potential alternative would require the Marshall Exchange to provide a substantial amount of upfront financial investment to fund the development of the subject property. The retail businesses would need to be operated for several years before the investment funds could be recouped and profit revenue could be generated for the Exchange. The amount of initial funding that would have to be invested and the length of time that would be required to generate revenue that could be used for the benefit of MSFC employees under this alternative would be financially impracticable for the Marshall Exchange, and would negatively impact the Exchange's ability to execute its functions. For these reasons, development of the subject property by the Marshall Exchange itself is not a reasonable alternative and is not carried forward for detailed analysis in this EA.

### **2.2.2 No-Action Alternative**

Under the No-Action Alternative, the subject property would not be leased or developed. The No-Action Alternative is analyzed in Section 4 as a baseline against which the Proposed Action can be compared.

## SECTION 3

# Affected Environment

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This section describes the existing environmental conditions potentially affected by the Proposed Action. In compliance with NEPA, CEQ guidelines, and 32 CFR Part 651, et seq., the description of the affected environment focuses on those resources and conditions potentially subject to impacts.

## 3.1 Air Quality

The Clean Air Act (CAA) requires the U.S. Environmental Protection Agency (USEPA) to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. USEPA has established NAAQS for the following six principal pollutants, which are called criteria pollutants: carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter, and sulfur dioxide. Areas that meet the air quality standard for the criteria pollutants are designated as being "in attainment." Areas that do not meet the air quality standard for one of the criteria pollutants may be subject to the formal rule-making process and designated as being "in nonattainment" for that standard. Areas that currently meet the air quality standard but previously were classified as nonattainment are "in maintenance" for that standard. The Huntsville/Madison County area is currently classified as being "in attainment" for all criteria pollutants stipulated under the NAAQS and is classified as a Class II air quality area.

MSFC is within an attainment area for all criteria pollutants. New or modified major stationary sources of air emissions at the Center are subject to Prevention of Significant Deterioration review to ensure that these sources are constructed without causing significant deterioration of regional air quality. A major new source is defined as one that has the potential to emit any pollutant regulated under the CAA in amounts equal to or exceeding specific major source thresholds. At present, there are no major stationary sources of air emissions on the subject property.

MSFC operates under an Alabama Department of Environmental Management (ADEM) Title V Air Quality Operating Permit (Permit No. 709-0014). As part of the Title V CAA Permit regulations, MSFC conducts an annual air emission inventory.

## 3.2 Noise

Noise, in the context of this EA, refers to sounds generated by activities that could affect residents outside RSA or wildlife. Human hearing is best approximated by using an A-weighted decibel scale (dBA). Psychologically, most humans perceive a doubling of sound as an increase of 10 dBA (USEPA, 1974).

Noise level is often expressed as day-night averaged sound level (Ldn), which is the dBA sound level over a 24-hour day and night period. The Ldn also applies a 10-dBA penalty to nighttime sounds occurring between 10 pm and 7 am to account for the desirability of a quieter night than day. The U.S. Department of Housing and Urban Development and the

U.S. Department of Defense define outdoor Ldn levels up to 65 dBA as acceptable for residences.

At present, the primary sources of noise at MSFC are hot gas testing and scale-model solid rocket motor testing, both of which are conducted in the East Test Area. Hot gas testing involves propulsion of hydrogen and air, and it is conducted at a greater frequency than scale-model solid rocket motor testing. Past testing of liquid fuel engines in the Test Area have historically generated the highest noise levels of any activity at MSFC. There have been only three liquid engine tests at MSFC in the last 20 years and none are planned for the foreseeable future.

Based on data presented in the USEPA publication, *Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances* (USEPA, 1971), outdoor construction noise levels range from 78 dBA to 89 dBA, approximately 50 ft (15.2 meters) from a typical construction site. Noise levels at 50 ft (15.2 meters) from a source decrease by approximately 3 dBA over a hard, unobstructed surface (such as asphalt), and by approximately 4.5 dBA over a soft surface (such as vegetation). Table 3-1 presents typical noise levels (dBA at 50 ft [15.2 meters]) estimated by USEPA for the main phases of outdoor construction.

**TABLE 3-1**

Typical Noise Levels For Outdoor Construction

EA for the Marshall Exchange Retail Development Property Lease at MSFC

| Construction Phase  | Noise Level<br>(dBA at 50 feet [15.2 meters] from source) |
|---------------------|---|
| Ground Clearing     | 84  |
| Excavation, Grading | 89  |
| Foundations         | 78  |
| Structural          | 85  |
| Finishing           | 89  |

dBA – decibel on the A-weighted scale

Source: USEPA, 1971

MSFC is located in the center of RSA, which provides an effective buffer zone between noise-producing activities at MSFC and the nearest residential area outside the Center, which are located within the Cities of Huntsville, Madison, and Triana. The nearest residential area to subject property is located approximately 2.5 miles (4 kilometers) to the southwest.

### 3.3 Topography

MSFC's topography is gently rolling, with elevations ranging from 560 to 650 ft (171 to 198 meters) above mean sea level (msl). The lowest elevations at MSFC are associated with areas inundated by Wheeler Reservoir and with the tributaries of Wheeler Reservoir and Indian Creek that are located on the Center (MSFC, 2007). Most of MSFC has slopes of 1 to 10 percent. Some flatland in the northern part of MSFC has slopes less than 1 percent.

The subject property generally slopes downward from the southeast to the northwest. Elevations range from an approximate high of 602 ft (183.5 meters) msl in the south central

part of the property to an approximate low of 572 ft (174.3 meters) msl in the northwestern part of the property. Slopes are steepest in the northern and western parts of the property.

### 3.4 Soils

MSFC is covered mostly by soils of the Decatur-Cumberland-Abernathy Association (MSFC, 2007). These soils are generally well-drained, red, fertile, silty clays, silt-clay loams, and silt loams that are typically associated with level to gently rolling terrain.

Surface soils on most of the subject property area are covered by upland forest and grassy vegetation. A relatively small percentage of the surface soils on the property are paved over by Building 4614 and Fowler Road. No hydric soils exist on the property.

### 3.5 Geology and Hydrogeology

MSFC is underlain by the Tuscumbia Limestone of Mississippian Age (MSFC, 2007). The Tuscumbia consists primarily of thin to thick beds of coarsely crystalline, dark to light gray fossiliferous limestone, with some interbedded layers of gray chert. The average thickness of the Tuscumbia in Madison County is about 150 ft (45.7 meters). The Tuscumbia Limestone is underlain by the Fort Payne Chert of Mississippian Age, which ranges from about 155 ft (47.2 meters) to 185 ft (56.4 meters) in thickness. The Fort Payne Chert is underlain by the Chattanooga Shale of Devonian Age, which is typically about 10 ft (3.1 meters) thick but may be as much as 40 ft (12.2 meters) thick in some areas.

The hydrogeology at MSFC is differentiated into three principal units: 1) residuum, 2) undifferentiated Tuscumbia Limestone and Fort Payne Chert (which comprise the Tuscumbia-Fort Payne Aquifer), and 3) Chattanooga Shale. The Chattanooga Shale is relatively impermeable and serves as a lower confining bed for the Tuscumbia-Fort Payne Aquifer.

The residuum is the surficial geologic unit at MSFC. This unit consists of silty clay material with variable amounts of chert rubble and boulders that were formed by the weathering of the underlying Tuscumbia Limestone. The thickness of the residuum generally ranges from about 10 ft (3.1 meters) to 80 ft (24.4 meters). Because the residuum is more permeable than the Chattanooga Shale, it acts as a groundwater reservoir that stores large amounts of water and releases it slowly into the underlying bedrock aquifer (Geological Survey of Alabama, 1975). Groundwater recharge in the residuum is almost exclusively from precipitation.

The Tuscumbia Limestone and the Fort Payne Chert form the Tuscumbia-Fort Payne Aquifer (Bossing and Harris, 1987). The Tuscumbia-Fort Payne is the primary aquifer in the region for water supply. This unit is composed of about 300 ft (91.4 meters) to 330 ft (100.6 meters) of fossiliferous and dolomitic limestone with occasional interbedded chert. The Tuscumbia-Fort Payne is a karst aquifer, where groundwater occurs within solution-enlarged fractures, joints, and bedding planes in the formation. Water enters the aquifer from the land surface through sinkholes and disappearing and losing streams. Because of this connection with the land surface, water levels in the aquifer respond quickly to rainfall. Although the potential for recharge is high in areas of surface connection, the primary means of recharge for the aquifer is fairly uniform areal recharge from the groundwater reservoir of the overlying residuum (Geological Survey of Alabama, 1975).

The water table in the residuum generally emulates topography and is influenced by surface waters such as streams and springs. The horizontal component of the hydraulic gradient at MSFC slopes southward toward the Wheeler Reservoir and ultimately to the Tennessee River. The primary pathway for horizontal groundwater flow in the residuum is the chert rubble zone near the residuum and bedrock interface. The hydraulic conductivity of the rubble zone is generally higher than that of the more clayey portions of the upper residuum. In the vicinity of local surface waters, the residuum groundwater flows horizontally towards, and discharges to, the surface waters. With the absence of surface water influences, the horizontal component of the hydraulic gradient becomes negligible, leaving groundwater flow with a primary vertical component. As a result, the residuum groundwater primarily discharges downward into the bedrock aquifer.

In southwest Madison County, the general direction of groundwater flow within the Tuscumbia-Fort Payne Aquifer is southward toward the Tennessee River. The movement of groundwater within this aquifer is more comparable to pipe or conduit flow than to flow through a porous medium because of solution features within the formation. Flow generally is controlled by gravity and the complex interconnection of solution-enlarged fractures and bedding planes. Groundwater flow can be turbulent, with velocities in the aquifer varying from less than a few feet to several hundred feet per day, depending on the development of solution features. Groundwater from the Tuscumbia-Fort Payne Aquifer beneath MSFC discharges to several surface water features in the vicinity of RSA and MSFC, including Indian Creek, McDonald Creek, and the spring near the abandoned Industrial Waste Treatment Facility. These surface water features ultimately discharge to Wheeler Lake and to the Tennessee River. Throughout MSFC, the residuum and bedrock groundwater flow direction is primarily to the south, southeast, and southwest (MSFC, 2007). Groundwater flow direction remains fairly consistent between the wet and dry seasons; however, steeper gradients and greater groundwater velocities occur during the wet season.

No geophysical surveys have been conducted on the subject property to date. Some information on bedrock and groundwater depths in the immediate vicinity of the property has been collected from existing groundwater monitoring wells. There is one groundwater monitoring well along the western boundary of the subject property (MW00-903), one well just outside the northern boundary of the property (MW00-904), and one well just outside the northwestern boundary of the property (MW-041). Based on the total depths of the wells, the bedrock depth is approximately 26 ft (7.9 meters) below land surface (bls) at MW00-093, approximately 21.5 ft (6.6 meters) bls at MW00-094, and approximately 15 ft (4.6 meters) bls at MW-041. In 2010, the annual average groundwater depths at MW00-903, MW00-904, and MW-041 were approximately 19 ft (5.8 meters) bls, 17 ft (5.2 meters) bls, and 10 ft (3 meters) bls, respectively.

### **3.6 Land Use**

The vast majority of the subject property area is undeveloped and covered by upland forest and grassy vegetation. The property is currently referred to as the "South Tenant Zone" on the latest version of MSFC's functional zone map. The current land-use classification of the property land is "Undeveloped".

### 3.7 Surface Water

The subject property as well as most of MSFC is located within the Indian Creek drainage basin, which drains into the Tennessee River (MSFC, 2007). Indian Creek originates in the northwestern portion of Madison County and flows southward adjacent to the western boundary of MSFC. Indian Creek merges with Huntsville Spring Branch in the backwaters of Wheeler Reservoir southwest of MSFC and then flows southward into the Tennessee River. The Tennessee River is located approximately 3 miles (4.8 kilometers) southwest of MSFC at its closest point. Most of the drainage at MSFC flows through manmade ditches into intermittent and perennial streams that either flow west into tributaries of Indian Creek, or south and southeast into tributaries of Huntsville Spring Branch. There are no rivers in the vicinity of MSFC that are protected under the Wild and Scenic Rivers Act (MSFC, 2007).

There are a total of 11 springs at MSFC, each of which either feeds into Indian Creek or Huntsville Spring Branch (MSFC, 2007). Of these springs, six are located in the southwestern part of MSFC, three in the East Test Area, one along the western boundary of MSFC (Williams Spring), and one in the north central part of MSFC. The largest spring, Williams Spring (also known as NASA Spring), is located just north of where Martin Road crosses Indian Creek along the western boundary of the Center. This spring feeds a tributary to Indian Creek and discharges approximately 3,800 liters per minute. The Williams Spring pool, run, and surrounding wetland is designated as the Williams Spring Ecologically Sensitive Area.

There are no surface water bodies within or in the immediate vicinity of the subject property. Stormwater drainage on the property primarily flows toward the west and northwest. An upland-cut drainage ditch runs along the southern side of Fowler Road within the property. This ditch appears to be the primary drainage feature that directs stormwater from the property westward toward Indian Creek. During the field investigation conducted for this EA on August 10, 2011, the portion of this ditch that is located within the property did not contain water. This ditch and its connections are downstream of Williams Spring.

### 3.8 Vegetation

Most of the subject property area is covered by upland forest. The remaining portions of the property consist primarily of fallow field and mowed grass. The existing vegetative cover within the subject property is shown on Figure 3-1. The vegetative communities on the property were mapped and characterized during an ecological survey conducted in September 2010 by CH2M HILL Inc. This survey covered all of MSFC property accessible by foot and was conducted specifically to collect data to update MSFC's Natural Resources Management Plan (NRMP). As shown on Figure 3-1, three upland forest communities exist on the portion of the property south of Fowler Road: pine plantation, deciduous forest, and pine forest. Pine plantation is the dominant upland forest community on the property. Deciduous forest and pine forest, which occur in the western part of the property, each represent a relatively small percentage of the total upland forest cover. As shown on Figure 3-1, an area of fallow field abuts the southern side of Fowler Road.

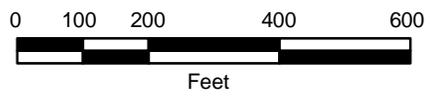
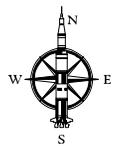


**Legend**

- ..... ROW & Lease Line
- MSFC Boundary

**Land Cover Type**

- DF - Deciduous Forest
- MFM - Mixed Forest, Mesic
- MF - Mixed Forest
- PF - Pine Forest
- PP - Pine Plantation
- Fallow
- Mowed



23-FEB-2011  
 Drawn By:  
 D. Scott Stevens

**FIGURE 3-1**  
 Vegetation on Marshall  
 Exchange Lease Property

All other undeveloped, non-forested parts on the property are areas of regularly mowed grass. General descriptions of the pine plantation, deciduous forest, pine forest, and fallow field communities that exist on MSFC, based on data collected during the September 2010 ecological survey, are provided below. These communities are described in greater detail in the 2011MSFC NRMP (MSFC, 2011).

Pine plantations are areas where pines have been planted for harvest. Loblolly pine is the only pine species that is planted at MSFC for harvest. Planted areas consist of densely planted rows of even-aged trees. The abundance and diversity of other plant species within pine plantations are usually low due to the low light levels under the canopy. Species that typically occur as the understory of pine plantations include sweetgum (*Liquidambar styraciflua*), black cherry (*Prunus serotina*), blackjack oak (*Quercus marilandica*), common persimmon (*Diospyros virginiana*), and red maple (*Acer rubrum*). Several vine species are also common, including poison ivy (*Toxicodendron radicans*), muscadine (*Vitis rotundifolia*), and greenbriar (*Smilax spp.*). Parcels of planted pine at MSFC are managed by RSA foresters. Pine stands are considered for harvest every 7 to 10 years, depending on growth (RSA, 2010). They are periodically thinned, grown to rotation age, harvested, and replanted. Although loblolly pine is the only pine species that is planted at MSFC for harvest, RSA expects that the pine that has been planted on the subject property is likely a non-native species that may have been planted experimentally to determine that species' feasibility as a commercial tree.

Deciduous forests at MSFC are relatively diverse in species composition, with many species co-dominating the canopy and subcanopy layers. Common canopy and sub-canopy species in deciduous forests at MSFC include tulip poplar (*Liriodendron tulipifera*), white ash (*Fraxinus americana*), eastern cottonwood (*Populus deltoides*), black walnut (*Juglans nigra*), American basswood (*Tilia americana*), eastern white oak (*Quercus alba*), basket oak (*Quercus michauxii*), willow oak (*Quercus phellos*), northern red oak (*Quercus rubra*), southern hackberry (*Celtis laevigata*), red bud (*Cercis canadensis*), and flowering dogwood (*Cornus florida*). Common shrub species include red buckeye (*Aesculus pavia*), Carolina buckthorn (*Rhamnus caroliniana*), and possumhaw holly (*Ilex decidua*).

Pine forests at MSFC are former oak-hickory-eastern red cedar forests that have converted to pine-dominated communities. Pine forests at MSFC have relatively sparse canopies that typically lack oaks and hickories; however, the sub-canopies and shrub layers of pine forests typically contain a high density of oaks. Most of the pine forests at MSFC have canopies that are dominated by loblolly pine. Common sub-canopy species in pine forests include sweetgum, water oak (*Quercus nigra*), southern red oak (*Quercus falcata*), eastern red cedar (*Juniperus virginiana*), northern red oak, black cherry, common persimmon, and red bud. Common shrub species include sassafras (*Sassafras albidum*), winged sumac (*Rhus copallina*), and Carolina buckthorn.

Fallow fields are undeveloped areas that have been cleared but are not maintained on a regular basis. These areas have been allowed to re-vegetate naturally and they consist primarily of grasses, forbs, vines, and some shrubs. Of the upland communities at MSFC, fallow fields contain the greatest amount of invasive exotic plant species. Some fallow fields are completely covered by exotic species. Native plant species that occur in fallow fields at MSFC include goldenrods (*Solidago spp.*), white crown-beard (*Verbesina virginica*), ragweed (*Ambrosia artemisiifolia*), giant ragweed (*Ambrosia trifida*), Spanish needles (*Bidens alba*), bitterweed (*Helenium amarum*), and bluestems (*Andropogon spp.*).

## 3.9 Wildlife

The subject property provides a moderate amount of wildlife habitat. The property is mostly undeveloped and contains three types of upland forest communities (pine plantation, deciduous forest, and pine forest), fallow field, and mowed grass (See Section 3.8). The property is bordered on the north, east, and south by roads, and on the west by sparsely developed land. Based on the amount and type of habitat that exists within and in the vicinity of the property, the property is expected to be potentially utilized by a variety of wildlife species that typically occur in upland habitats at MSFC, which may include white-tailed deer (*Odocoileus virginianus*), gray squirrel (*Sciurus carolinensis*), cottontail rabbit (*Sylvilagus floridanus*), raccoon (*Procyon lotor*), opossum (*Didelphis virginiana*), eastern box turtle (*Terrapene carolina*), skinks, black racer snake (*Coluber constrictor*), garter snake (*Thamnophis sirtalis*), northern cardinal (*Cardinalis cardinalis*), rock pigeon (*Columba livia*), black vulture (*Coragyps atratus*), American crow (*Corvus brachyrhynchos*), blue jay (*Cyanocitta cristata*), woodpeckers, northern mockingbird (*Mimus polyglottos*), Carolina chickadee (*Parus carolinensis*), and eastern bluebird (*Sialia sialis*).

The wildlife habitat quality of the subject property was evaluated during an ecological survey conducted in September 2010 by CH2M HILL Inc. This survey covered all of MSFC property accessible by foot and was conducted specifically to collect data to update MSFC's NRMP. During this survey, upland and wetland natural communities at MSFC were qualitatively rated as providing either good, moderate, or poor quality wildlife habitat based on specific community criteria associated with habitat quality. The community criteria evaluated included vegetation strata (e.g., stand age and density); vegetation diversity and abundance; food sources (e.g., most producing species); water sources; parcel size and connectivity to other habitats; habitat buffers; snags and downed wood; ground disturbance; hydrological alterations; invasive exotic species; seasonal disturbances (e.g., mowing); and fire regime. The evaluation of wildlife habitat quality during the September 2010 ecological survey is discussed in greater detail in the 2011 MSFC NRMP (MSFC, 2011).

Based on the findings of the September 2010 ecological survey, the entire subject property area provides poor quality wildlife habitat. The pine plantation, pine forest, and fallow field habitats on the property rated low on many of the criteria used to evaluate wildlife habitat quality. Other aspects of the property, including its location, fragmentation, and connectivity to other habitats also diminish the quality of wildlife habitat that is provided by the property. The wildlife habitat quality of the property is discussed further in Section 4.9.1.

## 3.10 Listed and Sensitive Species

Assessments of listed/sensitive species occurrence at MSFC are based primarily on a September 2010 ecological survey conducted at MSFC by CH2M HILL Inc., Tuscumbia darter surveys conducted at MSFC, and surveys conducted at RSA. The September 2010 ecological survey covered all of MSFC property accessible by foot, including the subject property. This survey focused primarily on listed/sensitive species that have been documented to occur at RSA in habitats that also exist at MSFC. The findings of the September 2010 ecological survey are discussed in the 2011 MSFC NRMP (MSFC, 2011).

The listed/sensitive species that have been documented to occur at RSA are discussed in the RSA Endangered Species Management Plan (RSA, 2006) and the RSA INRMP (RSA, 2010), and are presented in Table 3-2.

**TABLE 3-2**

Listed and Sensitive Species Documented to Occur at Redstone Arsenal  
EA for the Marshall Exchange Retail Development Property Lease at MSFC

| Scientific Name                           | Common Name                | Federal Status | State Status | Global and State Rank |
|---|----------------------------|----------------|--------------|-----------------------|
| <b>PLANTS</b>                             |                            |                |              |                       |
| <i>Apios priceana</i>                     | Prices' potato bean        | LT             |              | G2S2                  |
| <i>Eriogonum longifolium var. harperi</i> | Harper's umbrella plant    | SC             |              | G4T2S1                |
| <i>Hottonia inflata</i>                   | Featherfoil                |                |              | G4S2                  |
| <i>Leavenworthia uniflora</i>             | Michaux's glade cress      |                |              | G4S2                  |
| <i>Monotropa hypopithys</i>               | Pinesap                    |                |              | G5S2                  |
| <i>Ophioglossum engelmannii</i>           | limestone adder's tongue   |                |              | G5S2S3                |
| <i>Panax quinquefolius</i>                | American ginseng           |                | R            | G3G4S4                |
| <i>Sida elliotii</i>                      | Elliott's fan-petal        |                |              | G4G5S2                |
| <i>Silphium brachiatum</i>                | Cumberland rosinweed       | SC             |              | G2G3S2                |
| <i>Silphium confertifolium</i>            | Southern rosinweed         | SC             |              | G2S3                  |
| <i>Trillium pusillum var. alabamicum</i>  | dwarf trillium             | SC             |              | G3T2S2                |
| <b>INVERTEBRATES</b>                      |                            |                |              |                       |
| <i>Orconectes australis australis</i>     | Cave crayfish              |                |              | G5S3                  |
| <i>Palaemonias alabamae</i>               | Alabama cave shrimp        | LE             | SP           | G2G3S1                |
| <i>Pleurocera pyrenella</i>               | skirted hornsnail          | SC             |              | G2S2                  |
| <b>VERTEBRATES</b>                        |                            |                |              |                       |
| <i>Etheostoma tuscumbia</i>               | Tuscumbia darter           | SC             | SP           | G2S2                  |
| <i>Typhlichthys subterraneus</i>          | southern cavefish          |                | SP           | G3G4S3                |
| <i>Alligator mississippiensis</i>         | American alligator         | LT (S/A)       |              | G5                    |
| <i>Aneides aeneus</i>                     | green salamander           | SC             | SP           | G3G4S3                |
| <i>Vireo solitarius</i>                   | blue-headed vireo          |                |              | G5S2BS4N              |
| <i>Falco peregrinus anatum</i>            | American peregrine falcon  | FE             | SP           | G4SHBS3N              |
| <i>Haliaeetus leucocephalus</i>           | Bald eagle                 | FT             | SP           | G5S3B                 |
| <i>Myotis grisescens</i>                  | gray bat                   | LE             | SP           | G3S2                  |
| <i>Myotis sodalis</i> <sup>1</sup>        | Indiana bat                | LE             | SP           | G2S2N                 |
| <i>Myotis septentrionalis</i>             | Northern long-eared myotis |                |              | G4S2                  |

**Notes:**

<sup>1</sup> potential occurrence

**TABLE 3-2**  
Listed and Sensitive Species Documented to Occur at Redstone Arsenal  
EA for the Marshall Exchange Retail Development Property Lease at MSFC

| Scientific Name   | Common Name | Federal Status | State Status | Global and State Rank |
|---|-------------|----------------|--------------|-----------------------|
| <b>Sources</b>  |             |                |              |                       |
| Redstone Arsenal Endangered Species Management Plan, 2006   |             |                |              |                       |
| Redstone Arsenal Integrated Natural Resources Management Plan, 2010   |             |                |              |                       |
| Alabama Natural Heritage Program (ALNHP) Website, Rare Species Tracking List, <a href="http://www.alnhp.org">http://www.alnhp.org</a> , Updated November 2010   |             |                |              |                       |
| <b>Federal Status</b>   |             |                |              |                       |
| LE Listed Endangered - species in danger of extinction throughout all or a significant portion of their range   |             |                |              |                       |
| LT Listed Threatened - species likely to become an endangered species within the foreseeable future throughout all or a significant portion of their range.   |             |                |              |                       |
| S/A Similarity of Appearance  |             |                |              |                       |
| SC Species of Concern   |             |                |              |                       |
| FE Former LE  |             |                |              |                       |
| FT Former LT  |             |                |              |                       |
| <b>State Status</b>   |             |                |              |                       |
| R Regulated by permit   |             |                |              |                       |
| SP State Protected – species by protected by Alabama Nongame Species Regulation   |             |                |              |                       |
| <b>Global and State Rank</b>  |             |                |              |                       |
| G Global Rank - refers to a species' range-wide or global status  |             |                |              |                       |
| S State Rank – refers to a species' status in the state   |             |                |              |                       |
| Species with a rank of 1 are most critically imperiled; those with a rank of 5 are most secure. Complete Global and State Rank definitions can be found on ALNHP website, <a href="http://www.alnhp.org">http://www.alnhp.org</a> . |             |                |              |                       |

As indicated in Table 3-2, a total of 24 listed/sensitive species have been documented to occur at RSA. Of these species, five are federally listed (Threatened or Endangered) and eight are State Protected. The five federally listed species are the Prices' potato bean (*Apios priceana*), American alligator (*Alligator mississippiensis*), Alabama cave shrimp (*Palaemonias alabamae*), gray bat (*Myotis grisescens*), and Indiana bat (*Myotis sodalis*). The American alligator is federally listed as Threatened solely due to its resemblance to the federally Endangered American crocodile (*Crocodylus acutus*), which has suffered population declines and is in need of regulatory protection. The American crocodile is not known to occur in Alabama.

No federally listed species have been observed at MSFC during past surveys (MSFC, 2011). The only sensitive species that has been observed at the Center is the Tuscumbia darter (*Etheostoma tuscumbia*), which is a federal Species of Concern and a State Protected species. The only known location of this species at MSFC is in Williams Spring and its run. The Tuscumbia darter is also known to occur in Jaya Spring located on RSA. The Williams Spring pool, run, and surrounding wetland is designated as the Williams Spring Ecologically Sensitive Area (ESA). The Williams Spring ESA is located approximately 1,240

feet northwest of the property at its nearest point. The Williams Springs ESA is the only ESA on MSFC. Including the Williams Spring ESA, there are a total of eight ESAs on RSA.

Based on the types of natural communities that exist at MSFC and its location within RSA, several of the listed/sensitive species documented to occur at RSA have the potential to also occur at MSFC (MSFC, 2011). Of the listed/sensitive plant species documented to occur at RSA, only featherfoil (*Hottonia inflata*), pinesap (*Monotropa hypopithys*), American ginseng (*Panax quinquefolius*), and dwarf trillium (*Trillium pusillum* var. *alabamicum*) are considered to have a reasonably high probability of occurrence at MSFC. The remaining listed/sensitive plant species occur in habitats that do not exist or are very limited at MSFC; therefore, they are considered to have a lower probability of occurrence at the Center. No listed/sensitive plant species are expected to occur on the subject property based on the types of habitat that exist on the property.

The following listed/sensitive animal species are considered to have a reasonably high probability of occurrence at MSFC: skirted hornsnail (*Pleurocera pyrenella*), American alligator (*Alligator mississippiensis*), green salamander (*Aneides aeneus*), blue-headed vireo (*Vireo solitarius*), American peregrine falcon (*Falco peregrinus anatum*), bald eagle (*Haliaeetus leucocephalus*), gray bat (*Myotis grisescens*), Indiana bat (*Myotis sodalis*), and northern long-eared myotis (*Myotis septentrionalis*). The remaining listed/sensitive animal species, which are the cave crayfish (*Orconectes australis australis*), Alabama cave shrimp (*Palaemonias alabamiae*) and southern cavefish (*Typhlichthys subterraneus*), occur only in cave habitats, which do not exist at MSFC; therefore, they are considered to have no potential to occur at the Center. No listed/sensitive animal species are expected to occur on the subject property based on the types of habitat that exist on the property.

### 3.11 Cultural Resources

Cultural resources are prehistoric and historic sites, structures, districts, artifacts, or any other physical source of human activity considered to be culturally important. Cultural resources include historic resources (historic buildings and structures) and archaeological resources (prehistoric, historic, and traditional). Federal agencies are required to protect and preserve cultural resources in cooperation with state and local governments under NEPA and the National Historic Preservation Act of 1966, as amended (16 U.S.C. 470, Public Law 95-515).

The area now designated as MSFC initially was purchased in 1941 by the Army as part of a 32,255-acre acquisition for the Chemical Warfare Service in response to the munitions requirements of World War II. Before the purchase, the land was largely farmed for cotton, corn, hay, and small grains, and also used as pasture.

The MSFC Integrated Cultural Resources Management Plan (ICRMP) provides guidance on the management of cultural resources at MSFC in compliance with state and federal regulations (MSFC, 2009). The MSFC ICRMP establishes procedures for the identification, evaluation, preservation, and mitigation of cultural resources that are consistent with the mission of MSFC and the sound principles of cultural resource stewardship.

The two most recent archaeological surveys of MSFC were conducted in 2000 and 2005 (MSFC, 2009). Combined, these surveys covered the entire MSFC property and identified a total of 22 sites at the Center. Of the 22 sites identified, eight have been determined to be

ineligible for listing in the National Register of Historic Places (NRHP) and 14 have been determined to be eligible or potentially eligible for NRHP listing. Based on the findings of these surveys, there are no archaeological sites within the subject property. Two NRHP eligible sites are located in the immediate vicinity of the subject property: Site IMA359 and Site IMA1167.

Site IMA359 contains a Paleoindian component, an early to mid nineteenth century house site, and a historic cemetery. The subject property is located approximately 106 feet north of Site IMA359 at its nearest point. Centaur Street is located between the property and this site.

Site IMA1167 is a Middle Archaic through Middle Woodland habitation site. The eastern boundary of Site IMA1167 is located adjacent to the western boundary of the subject property. The subject property is located approximately 13 feet east of Site IMA1167 at its nearest point; however, most of the western boundary of the property is located much farther from the site.

There are no historic buildings or structures on the subject property (MSFC, 2009).

### **3.12 Socioeconomics**

The Huntsville Metropolitan Area (HMA) includes all of Madison and Limestone Counties. The Cities of Huntsville and Madison, both located in Madison County, are the two largest municipalities in the HMA. In 2000, the population of the HMA was 342,376 (U.S. Census Bureau, 2000). The population of the HMA was estimated to have grown to 386,632 in 2007, an increase of 12.9 percent since 2000 (U.S. Census Bureau, 2010). In 2000, the average household income in the HMA was \$55,343, per capita income was \$22,073, and the median age was 35.7 (U.S. Census Bureau, 2000). The total labor force of the HMA in 2006 was estimated to be 193,654 (U.S. Census Bureau, 2006).

During the past 50 years, the economy of the HMA has grown from agriculture and space-related industries to a diversified mix of manufacturing, testing, development, research, and support services. Cummings Research Park, located west of downtown Huntsville, is the second largest research park in the United States, encompassing 3,800 acres and employing 24,000 people. RSA is the largest employer in the HMA, followed by MSFC and the Huntsville Hospital System (Chamber of Commerce of Huntsville/Madison County, 2010).

As of April 2008, MSFC had more than 7,000 employees (NASA, 2011). MSFC had a 2008 FY budget of \$2.6 billion and generated more than \$1 billion in economic impact for Alabama in FY 2008 (NASA, 2011).

### **3.13 Public and Occupational Health and Safety**

MSFC is operated in compliance with all applicable federal laws, codes, and regulations and with all applicable laws, ordinances, codes, and regulations of the State of Alabama and Madison County with regard to construction, health, safety, food service, water supply, sanitation, and licenses and permits to do business.

All contractors at MSFC are responsible for following all applicable Occupational Safety and Health Administration (OSHA) regulations and for conducting their work in a manner that does not pose any risk to workers or Center personnel. Industrial hygiene responsibilities of

contractors as applicable include reviewing potentially hazardous workplaces; monitoring exposure to workplace chemicals (e.g., asbestos, lead, hazardous material), physical (e.g., noise propagation), and biological (e.g., infectious waste) agents; recommending and evaluating controls (e.g., ventilation, respirators) to ensure personnel are properly protected or unexposed; and ensuring a medical surveillance program is in place to perform occupational health physicals for those workers subject to any accidental chemical exposures or engaged in hazardous waste work.

The Medical Center at MSFC is located in Building 4249. This facility offers out-patient services only and provides emergency, therapeutic, preventive, and special medical and health services to MSFC employees and contractor personnel. Occupational medicine and environmental health services are provided at the Center under contract. Ambulance service is available any time by calling 911. The Medical Center maintains a staff of 21, including five industrial hygienists.

MSFC has an established physical security program for site facilities and operations. The Protective Services Office at MSFC is located in Building 4494. Protective security measures at MSFC include the use of physical barriers, electro-mechanical intrusion detection systems, protective lighting, warning notification, identification and badge recognition, and automated access control capability. Contracted security officers patrol MSFC continuously and are in charge of locking and unlocking most MSFC buildings after hours. MSFC is an area of exclusive federal jurisdiction; therefore, state, county, and city police have no jurisdiction within MSFC.

Twenty-four-hour firefighting services, including hazardous materials response/mitigation and medical services, are provided to MSFC by four fire stations owned and operated by the Army, under an agreement that provides the Army with reimbursement. In the event of a fire at MSFC or RSA, all stations are alerted and respond. In addition to the firefighting services provided by the Army, MSFC has a mutual aid agreement with the City of Huntsville Fire Department for firefighting and hazardous materials assistance, as well as a working agreement with other local municipalities. All significant MSFC buildings are connected to a central fire alarm and reporting system. Each building has a fire alarm system that includes automatic smoke or heat detectors and manual pull stations.

### 3.14 Utilities

RSA obtains electrical power from the Tennessee Valley Authority (TVA). The primary supply is obtained from the 161 kilovolt (kV), 3-phase transmission systems of the TVA. MSFC is billed by RSA for all electrical power consumed. MSFC also has approximately 1,800-kV total capacity through several emergency generators for critical or special electrical circuits. RSA's main steam plant is the City of Huntsville Solid Waste Disposal Authority Steam Plant operated by Covanta Energy Corporation. MSFC is supplied with steam from RSA's steam supply. Steam is provided by boiler plants and modular boilers located within MSFC buildings. The boiler plants are located in the Test Area and are used exclusively for heat and processes associated with test operations. RSA receives its natural gas supply from the City of Huntsville. Natural gas is routed through MSFC in a 12-inch pipeline.

The main source of potable and industrial water for RSA and MSFC is the Wheeler Reservoir of the Tennessee River. No water supply wells exist at MSFC. Potable and industrial water are stored using elevated steel tanks and steel and concrete standpipes. This equipment is capable

of storing 1.9 million gallons (7.18 million liters) of potable water and 7.5 mg of industrial water. Domestic wastewater at MSFC is treated by Domestic Treatment and Collection System 3 which is operated by PDR Properties, Inc. and consists of 6-inch to 18-inch-diameter gravity sewers. There are four force main pumping stations serving RSA and ten lift stations serving MSFC. Effluent is discharged to the Tennessee River under the provisions of the current National Pollutant Discharge Elimination System (NPDES) permit held by PDR Properties, Inc. The majority of the industrial wastewater at MSFC is sent to the Industrial Wastewater Treatment Facility, which has a treatment capacity of 50,000 gallons (189,271 liters) per day.

Aboveground electrical lines run north/south through the western and central parts of the subject property and an aboveground steam line runs east/west through the southern part of the property. Underground utilities on the property include sanitary sewer, storm sewer, potable water, telecommunications, and natural gas.

### **3.15 Solid Waste**

Refuse and nonhazardous waste generated at MSFC are collected by the MSFC Custodial and Refuse Collection Services contractor and disposed of under the provisions of RSA's Support Agreement. "Acceptable" solid waste is incinerated at a refuse fired steam plant located on the eastern boundary of RSA. "Unacceptable" nonhazardous waste (construction waste, rubble, vegetation, and asbestos) excluded from the incinerator is disposed of at RSA's Construction Debris Landfill located south of Building 5678. This landfill is classified as a Construction/Demolition Landfill and is permitted to receive 300 average tons (272.2 metric tons) per day.

### **3.16 Traffic Flow**

The road system within MSFC consists of primary, secondary, and tertiary roads. All primary roads are surfaced with asphaltic concrete. Many of the secondary roads have paving of bituminous plant mix or asphalt surface treatment. The tertiary roads generally are surfaced with gravel, and most of them are located in the Test Area. Maintenance of Martin, Marshall, Neal, Morris, Fowler, Rideout, and Dodd roads is provided by RSA as part of a support agreement with MSFC. RSA also is responsible for maintenance of the gates and bridges. MSFC is responsible for maintenance of all other roads and paved areas within its boundaries. Currently, all traffic to and from MSFC and RSA is routed through six gates. The Main Gate is Gate 9 on Rideout Road on the northern side of RSA.

The subject property is bordered to the north by Martin Road, to the east by Gemini/Fowler Road, and to the south by Centaur Street (see Figures 2-3 and 2-4). A portion of Fowler Road runs through the northeastern part of the property, south of Building 4614.

### **3.17 Hazardous Materials and Waste**

#### **3.17.1 Storage and Handling**

A variety of hazardous materials are used at MSFC. Hazardous substances have been declared hazardous through federal listings including: Extremely Hazardous Substances (EHSs), listed in 40 CFR 355; those listed as hazardous if released, under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) in 40 CFR 302.4; and by

definition of hazardous chemicals by OSHA, in 29 CFR 1910.1200. In addition to these substances defined as hazardous, pesticides and sources of radiation are regulated.

Sections 311 and 312 of the Emergency Planning and Community Right-to-Know Act require any user to submit a report, known as a Tier II, annually for any substance that is present at MSFC in the following quantities:

- Greater than or equal to 10,000 pounds at any one time for a hazardous chemical; and
- Greater than or equal to 500 pounds or the Threshold Planning Quantity, whichever is less, at any time, for EHSs.

At present, no hazardous materials are stored or handled within the subject property.

### **3.17.2 Waste Management**

MSFC is classified according to federal and state regulations as a large quantity hazardous waste generator. MSFC generates more than 1,000 kilograms of hazardous waste each month. Federal regulations on hazardous waste are contained in 40 CFR Parts 260 to 279, and are a result of Subtitle C of the Resource Conservation and Recovery Act (RCRA), which requires a program to track hazardous waste from generation to storage to transportation to disposal.

NASA maintains a comprehensive inventory of all RCRA-defined hazardous wastes and controlled wastes not regulated by RCRA. The collection and management of hazardous waste data are the responsibility of the Environmental Support Contractor (ESC). MSFC has established hazardous and controlled waste accumulation site inspection guidelines that serve to monitor the accumulation activities of each generating activity throughout MSFC. Full drums of wastes are stored temporarily in the Hazardous Waste Storage Facility (HWSF). Within a 60- to 70-day time period, the ESC arranges for shipment of the containers to an appropriate Treatment, Storage, and Disposal Facility, so that MSFC is not subject to regulation under RCRA as a hazardous waste storage facility. All similar waste is combined within a consolidation area in the HWSF. Hazardous wastes are disposed offsite at several hazardous waste disposal facilities approved by USEPA. Wastes are transported from MSFC by licensed hazardous waste transporters. Special wastes generated at MSFC include asbestos, industrial waste, petroleum-contaminated soil and water from spill cleanup, and medical waste.

At present, hazardous waste management is not conducted or needed within the subject property.

### **3.17.3 Contaminated Areas**

In 1994, MSFC was placed on the National Priorities List, which requires compliance with CERCLA. In response, MSFC conducted a surface media Remedial Investigation (RI) for the entire property in 1999 to assess the nature and extent of contamination, to evaluate public health risks, and to screen potential remedial actions. Contaminated areas were divided into operable units (OUs). OUs were then divided among media: surface soil, subsurface soil, surface water, sediment, and groundwater.

A substantial portion of MSFC is underlain by groundwater that is contaminated by chlorinated solvents because of the prevalent use of these compounds in the past. Most of the contamination is located in the rubble zone of the residuum layer. The primary contaminants in the rubble zone plumes are the chlorinated volatile organic compounds (CVOCs): tetrachloroethene (PCE), trichloroethene (TCE), dichloroethene, vinyl chloride, carbon

tetrachloride (CTC), chloroform, and 1,1,2,2-tetrachloroethane. The following five major contamination plumes have been identified at MSFC (NASA, 2001a):

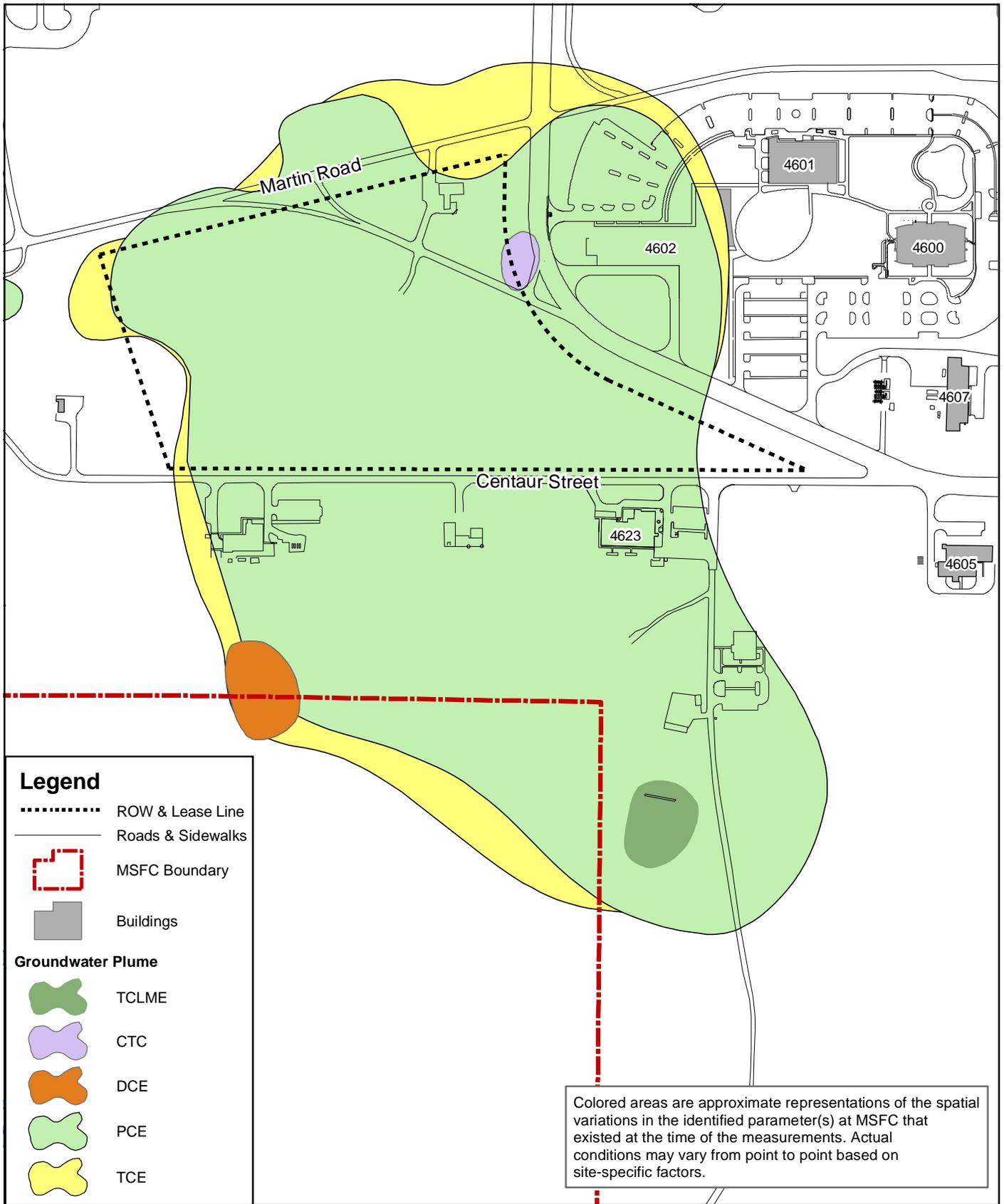
- Northwest Plume
- Northeast Plume
- Central Plume
- Southwest Plume
- Southeast Plume

The subject property is underlain by an unnamed chlorinated solvent plume (Figure 3-2). The CVOCs within the portion of this plume that is directly beneath the property are PCE, TCE, and CTC. The groundwater plume under the subject property originated from sources (Source Areas) north of the property in the 4700 Area of MSFC. The plume under the property is not a Source Area and it has relatively low concentrations of CVOCs.

There is a CERCLA site (MSFC-052) located in the northern part of the subject property (Figure 3-3). MSFC-052 is an industrial wastewater sewer pipeline that is currently being investigated as part of OU-2 (Industrial Sewer System). Groundwater beneath the industrial sewer is addressed under OU-3. The entire OU-2 industrial sewer system includes approximately 35,000 ft (10,668 meters) of buried pipe; the portion of the sewer designated as MSFC-052 is about 18,000 ft (5,486.4 meters) long. The Army installed the sewer in the 1940s to accommodate the munitions manufacturing processes during World War II. In 1960, NASA began manufacturing rocket components and the industrial sewer accommodated these processes as well. The sediments within the industrial sewer pipeline and the soils around the pipeline are contaminated primarily by arsenic. MSFC is currently conducting a Feasibility Study for OU-2 that includes a risk assessment and remediation plan.

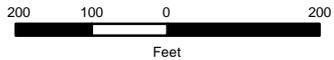
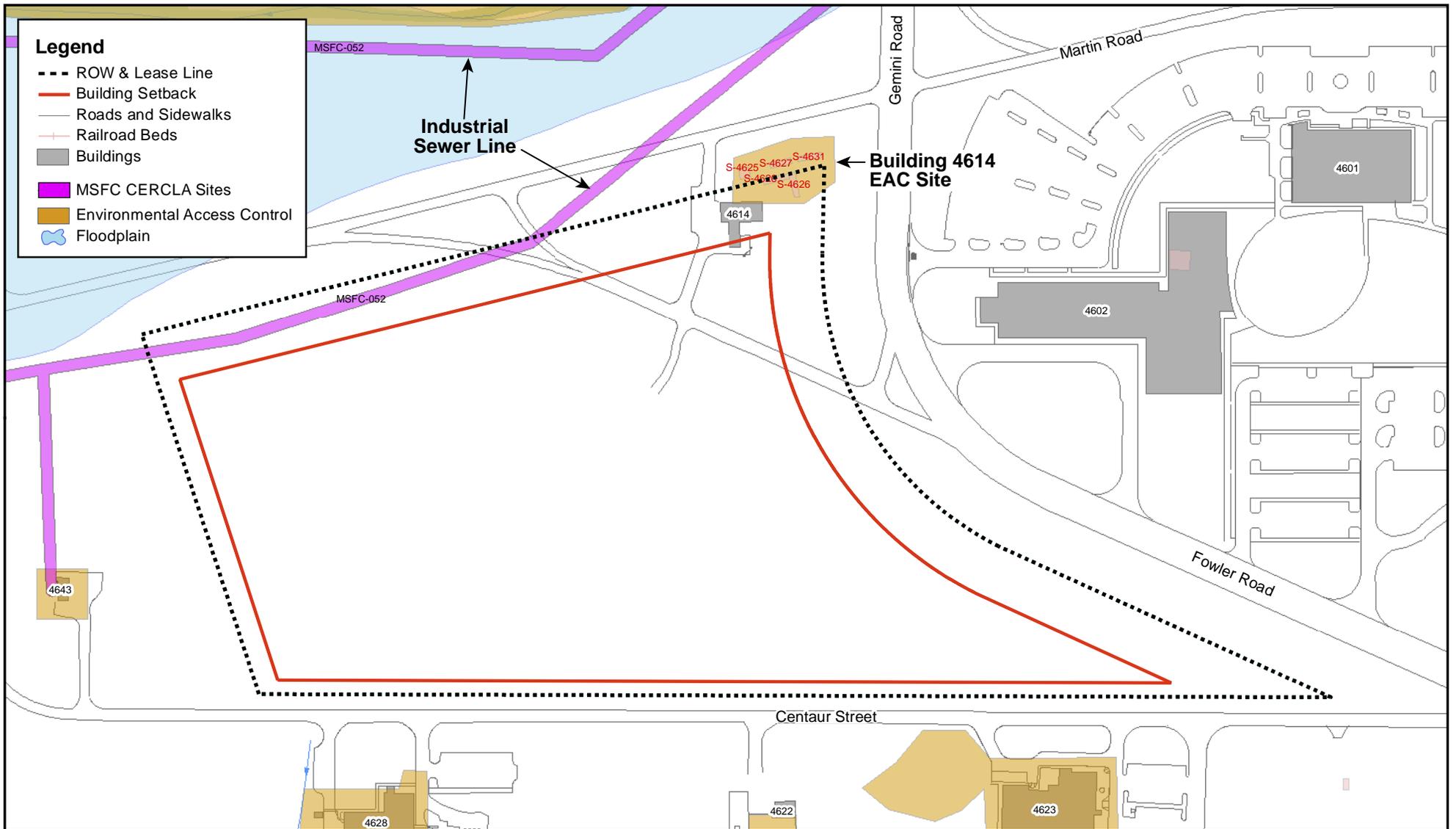
There is an Environmental Access Control (EAC) site located in the northeastern portion of the subject property (see Figure 3-3). This EAC site is currently being investigated as part of the OU-13 for potential contamination associated with potential releases from Building 4614 (Atmospheric Research Building), which is located in the northeastern part of the property. Based on the investigation and risk assessments conducted, no further investigation or remediation is recommended by MSFC for this EAC site. MSFC has submitted the draft final OU-13 RI report to ADEM and USEPA, and is waiting for comments from these agencies. Until regulatory agency concurrence is obtained, this EAC site is restricted from being disturbed.

At this time, it is not known if Building 4614 contains any lead-based paint (LBP), asbestos-containing materials (ACMs), or polychlorinated biphenyls (PCBs). There are no other known sources of these materials on the subject property. No underground storage tanks (USTs) or aboveground storage tanks (ASTs) exist within the subject property.



25-FEB-2010  
 Drawn By:  
 D. Scott Stevens

**FIGURE 3-2**  
 Chlorinated Solvent Plume Beneath  
 Marshall Exchange Lease Property



25-AUG-2011  
 Drawn By:  
 D. Scott Stevens

**FIGURE 3-3**  
 Industrial Sewer Line on  
 Marshall Exchange Lease Property

### 3.17.4 Ordnance

A considerable amount of ordnance was developed at RSA during World War II. As a result, RSA contains areas of ordnance and explosives contamination and potential contamination. The area that is now leased from RSA by MSFC has been surveyed for ordnance activity and disposal areas. Ordnance is defined collectively as Munitions and Explosives of Concern (MEC) and includes unexploded ordnance, ordnance that has exploded, and ordnance that does not have explosive potential. MEC is managed at RSA by RSA's Military Munitions Response Program (MMRP). The following five categories for MEC have been designated at RSA:

- Probability 1 - Frequent
- Probability 2 - Will occur several times during proposed site activities
- Probability 3 - Occasional
- Probability 4 - Seldom
- Probability 5 - Unlikely

The subject property is located within an area that is designated as Probability 5 - Unlikely for MEC (MSFC, 2007).

### 3.17.5 Quantity Distances

The Quantity Distance (QD) is the distance that should separate a location where propellants are stored or used from an inhabited building. The subject property is not located within any established QD at MSFC. The nearest QDs to the subject property are associated with Building 4623 (Materials Combustion Research Facility) and Building 4628 (Hydrogen Test Facility), which are both located south of the property on the southern side of Centaur Street (see Figures 2-3 and 2-4). Both of these buildings have active QDs that extend to the south away from the property.

## 3.18 Environmental Justice and Protection of Children

On February 11, 1994, the President issued EO 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*. This EO requires federal agencies to address disproportionate environmental and human health impacts from federal actions on minority populations and low-income populations. The President directed all federal agencies to analyze the environmental effects on minority and low-income communities, including human health, social, and economic effects. MSFC implements an Environmental Justice Plan (updated in 2003) in accordance with the requirements of EO 12898 and NASA's agency-wide Environmental Justice Strategy.

Guidelines for the protection of children are specified in EO 13045, *Protection of Children from Environmental Health Risks and Safety Risk* (Federal Register: 23 April 1997, Volume 62, Number 78). This EO requires that federal agencies make it a high priority to identify and assess environmental health and safety risks that may disproportionately affect children, and ensure that policies, programs, and standards address disproportionate risks to children that result from environmental health or safety risks.

## SECTION 4

# Environmental Consequences

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This section provides a detailed analysis of the potential environmental consequences associated with the implementation of the Proposed Action and the No-Action Alternative. The magnitude of the impact of an action is considered regardless of whether the impact is adverse or beneficial. The following terms are used to describe the magnitude of impacts:

- No Impact: The action would not cause a detectable change.
- Negligible: The impact would be at the lowest level of detection; the impact would not be significant.
- Minor: The impact would be slight but detectable; the impact would not be significant.
- Moderate: The impact would be readily apparent; the impact would not be significant.
- Major: The impact would be clearly adverse or positive; the impact has the potential to be significant. The significance of adverse and positive impacts is subject to interpretation and should be determined based on the final proposal. In cases of adverse impacts, the impact may be reduced to less than significant by mitigation, design features, and/or other measures that may be taken.

## 4.1 Air Quality

### 4.1.1 Proposed Action

Construction activities under the Proposed Action would result in short-term, minor impacts to air quality. Fugitive dust (particulate matter) and construction vehicle exhaust emissions would be generated during construction and would vary daily, depending on the level and type of work conducted. Fugitive dust would be generated by construction vehicle and equipment travel on dirt surfaces and by wind action on stockpiled materials. The primary risks from blowing dust particles relate to human health and human nuisance values. Fugitive dust from stockpiled materials would consist primarily of nontoxic particulate matter; however, fugitive dust can contribute to respiratory health problems and create an inhospitable working environment. Deposition on surfaces can be a nuisance to those living or working downwind. Fugitive dust would be controlled at the site using BMPs such as the periodic watering of stockpiled material. Workers would be responsible for following all applicable OSHA regulations and guidelines pertaining to prevention of airborne releases of associated dust and to worker protection from associated dust.

Pollutants that would be emitted from the internal combustion engine exhausts of construction vehicles and equipment include carbon monoxide, nitrogen oxide, particulate matter, and volatile organic compounds. These types of exhaust emissions would be temporary, and at their expected generation levels, would not significantly impact air quality.

At present, it is assumed that the private developer will be responsible for all ADEM air permitting and coordination required for sources of air emissions that are operated on the subject property. MSFC is currently not expected to be responsible for coordinating with ADEM or for permitting sources of air emissions that are proposed to be operated on the subject property either individually or through modification of MSFC's Title V Air Permit. Fugitive dust and exhaust emissions from construction activities would not collectively represent a new source of air emissions that would require permitting or coordination with ADEM. However, based on the types of retail services that are currently being considered for the subject property, the Proposed Action has the potential to involve the operation of sources of air emissions that require ADEM air permitting and/or coordination. Sources of air emissions that may be operated on the property that have the potential to require ADEM air permitting and/or coordination include, but are not limited to, dry cleaning operations, certain types of generators, and gas station ASTs and USTs. The operation of air emission sources that are currently expected to be associated with the Proposed Action are expected to have a minor impact on air quality. The actual sources of air emissions that would be operated on the property, their required ADEM permitting/coordination requirements, and their potential impacts on air quality will be required to be identified in separate NEPA documentation when information on the actual development planning and design is available.

Although no carbon dioxide (CO<sub>2</sub>) ambient air quality standards exist, the CEQ recently released draft guidelines on what may classify a project's greenhouse gas emissions as meaningful. According to the CEQ guidelines, a quantitative and qualitative assessment may be meaningful if the project's direct emissions are greater than 25,000 metric tons of CO<sub>2</sub>-equivalent (CEQ, 2010). The CO<sub>2</sub> emissions that would be generated during construction of the retail services on the subject property would be much lower than 25,000 metric tons of CO<sub>2</sub>-equivalent. Therefore, the Proposed Action would have a negligible contribution to greenhouse gas emissions.

For these reasons, the Proposed Action is preliminarily expected to have a minor impact on air quality; the impact is preliminarily expected to not be significant. When information on the actual development planning and design is available, assessment of the Proposed Action's potential impact on air quality may differ from this preliminary assessment.

#### **4.1.2 No-Action Alternative**

Under the No-Action Alternative, the subject property would not be leased or developed. Therefore, the No-Action Alternative would have no impact on air quality.

### **4.2 Noise**

#### **4.2.1 Proposed Action**

Construction activities under the Proposed Action would temporarily increase ambient noise levels in and around the subject property. The increased noise levels would be intermittent and limited to normal working hours and the overall construction period. Construction workers would use hearing protection and would follow OSHA standards and procedures.

As discussed in Section 3.2, typical construction work generates noise levels in the range of 78 to 89 dBA approximately 50 ft (15.2 meters) from the construction area (USEPA, 1971). Noise levels at 50 feet (15.2 meters) from a source are estimated to decrease by approximately 3 dBA over a hard, unobstructed surface (such as asphalt), and by approximately 4.5 dBA over a soft surface (such as vegetation). Based on these estimates of noise dissipation, noise generated during construction activities under the Proposed Action would not be audible in the nearest residential area, which is located approximately 2.5 miles (4 kilometers) southeast of the subject property. Negligible noise levels are expected to be generated from the operation of retail services on the subject property. Potential noise impacts on wildlife are discussed in Section 4.9.1

For these reasons, the Proposed Action is preliminarily expected to have a minor noise impact; the impact is preliminarily expected to not be significant. When information on the actual development planning and design is available, assessment of the Proposed Action's potential noise impact may differ from this preliminary assessment.

## **4.2.2 No-Action Alternative**

Under the No-Action Alternative, the subject property would not be leased or developed. Therefore, the No-Action Alternative would have no noise impact.

## **4.3 Topography**

### **4.3.1 Proposed Action**

At present, it is unknown to what extent the existing topography of the subject property would be altered by the private developer because no planning/design of the retail development has been initiated to date. The developer may contour the property via excavation and/or use of fill, or may develop the property without significantly altering the existing topography. Given that the difference between the highest and lowest elevations on the property is approximately 30 feet, and that this elevation change occurs over a relatively long distance across the site, any land contouring that is conducted by the developer would have a relatively minor overall impact on topography. Operation of the retail services on the subject property is not expected to involve any activity that would affect topography.

For these reasons, the Proposed Action is preliminarily expected to have a minor impact on topography; the impact is preliminarily expected to not be significant. When information on the actual development planning and design is available, assessment of the Proposed Action's potential impact on topography may differ from this preliminary assessment.

### **4.3.2 No-Action Alternative**

Under the No-Action Alternative, the subject property would not be leased or developed. Therefore, the No-Action Alternative would have no impact on topography.

## 4.4 Soils

### 4.4.1 Proposed Action

Construction activities under the Proposed Action would directly impact soils. Most of the surface soils on the subject property are covered by vegetation; a small percentage is paved over by Building 4614 and Fowler Road. Surface soils on the property would be disturbed during site clearing/grading, building construction, and other site development activities. The Proposed Action would result in a net increase in pavement surface area within the property. Based on the preliminary planning/design guidelines that have been prepared to date by MSFC for the retail development, it is currently expected that the maximum total coverage of buildings on the property would be restricted to 40 percent of the property area and the maximum total coverage of buildings plus other pavement would be restricted to 80 percent of the property area. Based on the amount of surface area that is expected to be disturbed, development of the subject property would have a moderate impact on soils. Operation of the retail services on the subject property is not expected to involve any activity that would affect soils.

The private developer would be required implement appropriate BMPs and erosion/sedimentation controls during the construction period to minimize potential indirect impacts to surrounding soils. The developer would be required obtain an ADEM NPDES stormwater construction permit and implement an associated Construction Best Management Practices Plan (CBMPP). The BMPs and erosion/sedimentation controls that would be implemented for the project would be discussed in the CBMPP.

For these reasons, the Proposed Action is preliminarily expected to have a moderate impact on soils; the impact is preliminarily expected to not be significant. When information on the actual development planning and design is available, assessment of the Proposed Action's potential impact on soils may differ from this preliminary assessment.

### 4.4.2 No-Action Alternative

Under the No-Action Alternative, the subject property would not be leased or developed. Therefore, the No-Action Alternative would have no impact on soils.

## 4.5 Geology and Hydrogeology

### 4.5.1 Proposed Action

At present, it is unknown to what extent the geology and hydrogeology of the subject property would be impacted by the private developer because no planning/design of the retail development has been initiated to date. The construction methods used to anchor building foundations as well as other construction activities have the potential to impact the subsurface geological formations and groundwater beneath the subject property. Construction methods that have been used to anchor building foundations at MSFC include, but are not limited to, the use of slab-on-grade, spread footing, steel pilings, and caissons. Slab-on-grade and spread-footing foundations require relatively shallow excavations that extend only a short distance into the residuum layer. For spread-footing foundations, concrete is poured into a wire-meshed spread-foot anchor within the excavated area to support the foundation. For steel-piling foundations, the steel pilings are typically extended

through the residuum layer down to the upper surface of the underlying bedrock or a few feet into the bedrock. The use of caissons involves boring through the residuum and into a few feet of the underlying bedrock to test for the presence of fractures or cavities. If solid lithology is encountered, a rebar anchor is secured through the borehole to support the foundation. The use of any of these four foundation anchoring methods at MSFC would typically have a relatively minor impact on subsurface geological formations. Other typical construction activities conducted at MSFC such as site clearing, grading, utility relocation/installation, stormwater drainage/retention system installation, landscaping, irrigation system installation, and road/parking area construction would also typically have a relatively minor impact on subsurface geological formations. Based on this rationale, construction activities under the Proposed Action are expected to have a minor impact on subsurface geological formations. Operation of the retail services on the subject property is not expected to involve any activity that would affect subsurface geological formations.

Building foundation anchoring methods do differ with respect to their potential effect on groundwater. Groundwater is typically not encountered during slab-on-grade or spread footing construction except in areas where the groundwater table is shallow, i.e., where it is near or above the slab-on-grade or spread-footing excavation depth. The past usage of steel pilings to anchor building foundations at MSFC has not caused groundwater to discharge to the surface. However, this method has the potential to cause groundwater to discharge to the surface because it involves the installation of steel pilings through the groundwater-bearing residuum zone. The use of caissons to anchor building foundations does require the dewatering of groundwater that collects in the caissons. The dewatering of caissons during a typical building construction project at MSFC would not remove a significant quantity of groundwater from the residuum zone. The amount of groundwater, if any, that would be removed by slab-on-grade, spread footing, or steel piling anchoring during a typical construction project at MSFC would also not be significant. Other construction activities that involve excavation have the potential to remove groundwater depending on the excavation depths and groundwater depths. Most typical construction activities that may require excavation such as site grading and utility installation would not remove a significant amount of groundwater provided that the excavations depth is shallower than the groundwater depth.

As discussed in Section 3.5, no geophysical surveys have been conducted on the subject property to date. Data collected from existing groundwater monitoring wells in 2010 indicate that the annual average groundwater elevations in 2010 were approximately 19 ft (5.8 meters) bls along the western boundary of the property, 17 ft (5.2 meters) bls just outside the northern boundary of property, and 10 ft (3 meters) bls just outside the northwestern boundary of the property. Based on this data and the site topography (see Section 3.3), annual average groundwater depths are preliminary assumed to potentially be greater than 15 ft (4.6 meters) throughout a significant portion of the eastern half of the property. Groundwater depths are preliminary expected to be shallowest in the northwestern part of the property. Based on these preliminary assumptions, it is expected that typical construction activities conducted in the higher portions of the property would involve the removal of little or no groundwater. Construction activities conducted in the lower portions of the property, particularly in the northwestern part of the site, have a higher probability of removing groundwater. Based on this rationale, construction activities under the Proposed Action are expected to have a minor impact on groundwater. This

assessment pertains only to the quantity of groundwater that is expected to be removed during construction activities. Although a significant amount of groundwater is not expected to be removed during construction activities under the Proposed Action, any amount of groundwater that is removed or otherwise handled during construction at MSFC is required to be appropriately managed in coordination with the MSFC Environmental Engineering and Occupational Health (EEOH) Office, ADEM, and USEPA, and in accordance with the guidelines contained within the *Final Land Use Controls Remedial Design Project for Operable Unit 3: Groundwater* (NASA, 2009), due to the potential presence of contaminants in the groundwater. The potential impacts that the Proposed Action would have on groundwater contamination are assessed in Section 4.17.1. Operation of the retail services on the subject property is not expected to involve any activity that would affect groundwater quantity.

For these reasons, the Proposed Action is preliminarily expected to have a minor impact on geology and hydrogeology; the impact is preliminarily expected to not be significant. When information on the actual development planning and design is available, assessment of the Proposed Action's potential impact on air quality may differ from this preliminary assessment.

#### **4.5.2 No-Action Alternative**

Under the No-Action Alternative, the subject property would not be leased or developed. Therefore, the No-Action Alternative would have no impact on geology or hydrogeology.

### **4.6 Land Use**

#### **4.6.1 Proposed Action**

Under the Proposed Action, the land-use classification of the property would be changed to reflect the retail services on the property for land-use mapping and planning purposes. Master planning personnel at MSFC have determined that the property is suitable to support retail services, and that its retail development would have no adverse effect on current land uses or future land-use planning at MSFC.

For these reasons, the Proposed Action is preliminarily expected to have a minor impact on land use; the impact is preliminarily expected to not be significant. When information on the actual development planning and design is available, assessment of the Proposed Action's potential impact on land use may differ from this preliminary assessment.

#### **4.6.2 No-Action Alternative**

Under the No-Action Alternative, the subject property would not be leased or developed. Therefore, the No-Action Alternative would have no impact on land use.

### **4.7 Surface Water**

#### **4.7.1 Proposed Action**

There are no surface water bodies within the subject property; therefore, construction activities under the Proposed Action would have no direct impact on surface waters. The

private developer would be required to implement appropriate BMPs and erosion/sedimentation controls during the construction period to minimize potential indirect impacts to surface waters outside the property. The developer would be required to obtain an ADEM NPDES stormwater construction permit and implement an associated CBMPP. The BMPs and erosion/sedimentation controls that would be implemented for the project would be discussed in the CBMPP. Provided that the developer meets all the above conditions, construction activities under the Proposed Action are expected to have a negligible, or no indirect impact on surface waters outside the property.

Development on the subject property would be required to be designed in compliance with Section 438 of the Energy Independence and Security Act (EISA) of 2007, which requires federal agencies to reduce stormwater runoff from federal development projects to protect water resources. EISA Section 438 requirements apply to projects that construct facilities with a footprint greater than 5,000 gross square feet, or expand the footprint of existing facilities by more than 5,000 gross square feet, inclusive of both building area and pavements. Implementation of EISA Section 438 can be achieved through the use of Low Impact Development (LID) techniques. Guidance on complying with EISA Section 438 through the use of LID techniques is provided in USEPA's December 2009 *Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act* (USEPA, 2009).

At present, it is unknown what type of stormwater drainage system would be constructed on the subject property by the private developer because no planning/design of the retail development has been initiated to date. The stormwater drainage system for the retail development would be required to accommodate the stormwater runoff volume generated by the added impervious area and meet all NASA, ADEM, and EISA Section 438 design requirements pertaining to stormwater retention, attenuation, and treatment. Oil/water separators and all other stormwater pollution prevention equipment/features must also be constructed and operated for any gas station, car wash, or other facility for which they are required. Provided that the developer meets all the above conditions, operation of the retail services on the property are expected to have a negligible, or no indirect impact on surface waters outside the property.

For these reasons, the Proposed Action is preliminarily expected to have a negligible impact on surface waters; the impact is preliminarily expected to not be significant. When information on the actual development planning and design is available, assessment of the Proposed Action's potential impact on surface water quality may differ from this preliminary assessment.

#### **4.7.2 No-Action Alternative**

Under the No-Action Alternative, the subject property would not be leased or developed. Therefore, the No-Action Alternative would have no impact on surface water.

## 4.8 Vegetation

### 4.8.1 Proposed Action

Retail development of the subject property under the Proposed Action would directly impact vegetation. At this time, it is not known how much of the existing vegetation at the site would be displaced by the private developer because no planning/ design of the retail development has been initiated to date. Based on the preliminary planning/ design guidelines that have been prepared to date by MSFC for the retail development, it is currently expected that the maximum total coverage of buildings on the property would be restricted to 40 percent of the property area and the maximum total coverage of buildings plus other pavement would be restricted to 80 percent of the property area. Under these guidelines, the developer would have the option of displacing up to 80 percent of the existing vegetation on the property with buildings and pavement. It is currently assumed that the developer would have the option of removing vegetation in the remaining 20 percent of the property as well although the remaining area would be required to be pervious, such as grass or landscaping. Based on these assumptions, it is expected that all the existing vegetation on the property could be removed under a maximum impact scenario.

As discussed in Section 3.8, the subject property consists of three types of upland forest communities, fallow field, and mowed grass. Based on the coverage of each vegetative community within the property (excluding mowed grass), the maximum amount of each vegetative community that would be removed under the Proposed Action is expected to be approximately 13.9 acres of pine plantation, 1.5 acres of deciduous forest, 1.3 acres of pine forest, and 1.2 acres of fallow field. Under this maximum impact scenario, the total amount of vegetation that would be removed would be 17.9 acres, and the vegetative community that would be impacted the most would be pine plantation (78 percent of total). Based on the total amount and type of vegetation that would be removed under a maximum impact scenario, the Proposed Action would have an overall moderate impact on vegetation. Given that the vast majority of the total vegetative cover that exists on property is pine plantation, most of the vegetation that would be removed under any reasonable development scenario is expected to be pine plantation. Pine plantations are considered to be relatively low-quality vegetative communities because they are man-made and undergo regular disturbance. Moreover, RSA expects that the pine that has been planted on the subject property is likely a non-native species that may have been planted experimentally to determine that species' feasibility as a commercial tree. The removal of 13.9 acres of pine plantation and relatively small amounts of the other vegetation types that exist on the property under a maximum impact scenario would not be a significant impact on vegetation. Operation of the retail services on the subject property is not expected to involve any activity that would affect vegetation.

Tree clearing on the subject property must be conducted in coordination with the RSA forestry program manager to determine any merchantability of forest products. The landscaping plan for the subject property must meet the minimum 3:1 native to non-native planting ratio per U.S. Army Garrison Policy 200-6 implemented at RSA, and it must not include any species that is on the RSA "Do Not Plant" list.

For these reasons, the Proposed Action is preliminarily expected to have a moderate impact on vegetation; the impact is preliminarily expected to not be significant. When information on the actual development planning and design is available, assessment of the Proposed Action's potential impact on vegetation may differ from this preliminary assessment.

## 4.8.2 No-Action Alternative

Under the No-Action Alternative, the subject property would not be leased or developed. Therefore, the No-Action Alternative would have no impact on vegetation.

## 4.9 Wildlife

### 4.9.1 Proposed Action

As discussed in Section 3.9, the subject property provides a moderate amount of poor quality wildlife habitat. Wildlife habitat on the property consists primarily of three types of upland forest communities (pine plantation, deciduous forest, and pine forest) and fallow field. Based on the amount and type of habitat that exists within and in the vicinity of the property, the property is expected to be potentially utilized by a variety of wildlife species that typically occur in upland habitats at MSFC. Based on the findings of the September 2010 ecological survey, the entire subject property area provides poor quality wildlife habitat. The pine plantation, pine forest, and fallow field habitats on the property rated low on many of the criteria used to evaluate wildlife habitat quality during the survey. Other aspects of the property, including its location, fragmentation, and connectivity to other habitats also diminish the quality of wildlife habitat that is provided by the property. Pine plantations in general provide poor quality wildlife habitat because they are disturbed on a regular basis by planting, thinning, and harvesting, which impacts their soil, vegetation, and hydrology. Pine plantations typically have dense monotypic canopies and lack diverse understories. Moreover, RSA expects that the pine that has been planted on the subject property is likely a non-native species that may have been planted experimentally to determine that species' feasibility as a commercial tree. Fallow fields in general also provide poor quality wildlife habitat because they are disturbed communities that contain significant amounts of invasive exotic plant species. The wildlife habitat provided by pine forests at MSFC is of variable quality. Pine forests at MSFC that provide poor quality wildlife habitat, such as the one that is located on the subject property, have been impacted by fire-suppression, fragmentation, and invasive exotic species. Most deciduous forests at MSFC are minimally disturbed; however, the deciduous forest on the subject property has been fragmented and impacted by past earthwork.

The maximum amount of each vegetative community that would be removed under the Proposed Action is expected to be approximately 13.9 acres of pine plantation, 1.5 acres of deciduous forest, 1.3 acres of pine forest, and 1.2 acres of fallow field (see Section 3.8.1). Under this maximum impact scenario, the total amount of wildlife habitat that would be removed would be 17.9 acres, and the habitat that would be impacted the most would be pine plantation (78 percent of total). Based on the total amount and quality of wildlife habitat that would be removed under a maximum impact scenario, the Proposed Action would have an overall moderate impact on wildlife habitat. Given that the vast majority of the total vegetative cover that exists on property is pine plantation, most of the habitat that would be removed under any reasonable development scenario is expected to be pine

plantation. The removal of 13.9 acres of pine plantation and relatively small amounts of the other habitats that exist on the property under a maximum impact scenario would not be a significant impact on wildlife habitat.

Under the Proposed Action, the potential for incidental animal mortality occurring during construction exists but is considered to be relatively low and limited to slow-moving species. Any losses would have a negligible effect on MSFC and regional wildlife population levels. Noise generated during construction activities may temporarily disturb wildlife species that occur in the vicinity of the subject property. Any disturbance experienced by wildlife species would be limited to the construction period and is expected to be relatively minor. Wildlife species that utilize the subject property are adapted to human activity as well as to noise levels generated by test activities at MSFC, which can exceed those that would be generated during construction activities. Operation of the retail services on the subject property is not expected to involve any activity that would affect wildlife.

For these reasons, the Proposed Action is preliminarily expected to have a moderate impact on wildlife; the impact is preliminarily expected to not be significant. When information on the actual development planning and design is available, assessment of the Proposed Action's potential impact on wildlife may differ from this preliminary assessment.

#### **4.9.2 No-Action Alternative**

Under the No-Action Alternative, the subject property would not be leased or developed. Therefore, the No-Action Alternative would have no impact on wildlife.

### **4.10 Listed and Sensitive Species**

#### **4.10.1 Proposed Action**

As discussed in Section 3.10, no federally listed species have been observed at MSFC during past surveys (MSFC, 2011). The only sensitive species that has been observed at the Center is the Tuscumbia darter, which is a federal Species of Concern and a State Protected species. The only known location of this species at MSFC is in Williams Spring and its run. The Williams Spring pool, run, and surrounding wetland is designated as the Williams Spring ESA. The Tuscumbia darter is also known to occur in Jaya Spring located on RSA.

Based on the types of natural communities that exist at MSFC and its location within RSA, several of the listed/sensitive plant and species documented to occur at RSA have the potential to also occur at MSFC (MSFC, 2011). Based on the types of habitat that exist within the subject property, no listed/sensitive species that have been documented on RSA are expected to occur on the subject property. The subject property does not contain the types of habitat that are known to support the listed/sensitive plant species that occur on RSA, nor does it provide suitable nesting or foraging habitat for any listed/sensitive animal species that occur on RSA. Therefore, the proposed development of the property under the Proposed Action is not expected to directly impact listed/sensitive species or their habitat.

Noise generated during construction activities is not expected to disturb listed/sensitive species due to the distances of known listed/sensitive species locations from the subject property. The proposed removal of habitat on the subject property is expected to have no

indirect impact on gray bat migration or foraging. The Proposed Action is also not expected to indirectly impact the groundwater, surface water, or wetlands/springs that occur in the Williams Spring ESA or any other ESA. The subject property is located downstream of the Williams Spring ESA; therefore, there is no potential for stormwater runoff from the subject property to reach the Williams Spring ESA and impact the Tuscumbia darter. As discussed in Section 4.7.1, construction activities under the Proposed Action are expected to have a negligible, or no indirect impact on surface waters outside the property. The private developer would be required to implement appropriate BMPs and erosion/sedimentation controls during the construction period to minimize potential indirect impacts to surface waters outside the property. The stormwater drainage system for the retail development would be required to meet all NASA, ADEM, and EISA Section 438 design requirements pertaining to stormwater retention, attenuation, and treatment. Oil/water separators and all other stormwater pollution prevention equipment/features must be constructed and operated for any gas station, car wash, or other facility for which they are required. Provided that the developer meets all the above conditions, construction activities and operation of the retail services under the Proposed Action are expected to have no indirect impact on listed/sensitive species or their habitat.

For these reasons, the Proposed Action is preliminarily expected to have no impact on listed/sensitive species. When information on the actual development planning and design is available, assessment of the Proposed Action's potential impact on listed/sensitive species may differ from this preliminary assessment.

#### **4.10.2 No-Action Alternative**

Under the No-Action Alternative, the subject property would not be leased or developed. Therefore, the No-Action Alternative would have no impact on listed/sensitive species.

### **4.11 Cultural Resources**

#### **4.11.1 Proposed Action**

As discussed in Section 3.11, there are no archaeological sites within the boundaries of the subject property based on the findings of past archaeological surveys. There are also no historic buildings or structures on the property. Two NRHP eligible sites are located in the immediate vicinity of the subject property: Site IMA359 and Site IMA1167. The subject property is located approximately 106 feet north of Site IMA359 at its nearest point. Centaur Street is located between the property and this site. The eastern boundary of Site IMA1167 is located adjacent to the western boundary of the subject property. The property is located approximately 13 feet east of Site IMA1167 at its nearest point; however, most of the western boundary of the property is located much farther from the site. The surveyed boundaries of these two archaeological sites include a buffer distance for site protection purposes; therefore, the distance between the property boundary and the actual site boundaries are greater than those stated above.

Under the Proposed Action, development of the property is not expected to impact the two archaeological sites that are located near the property. The private developer would be restricted from conducting any earthwork outside the boundary of the subject property. The developer would be required to clearly mark the property boundary in the field to prevent

any inadvertent earthwork from occurring outside the property. Given the close proximity of Site 1MA1167 to the property, it is also expected that the developer would be required to implement additional measures to protect the site such as posting signage and informing workers of the presence of the site.

The private developer would be required to implement Standard Operating Procedure (SOP) #4 of the MSFC ICRMP in the event that cultural materials are discovered during construction activities. SOP #4, *Responding to Inadvertent Discovery of Archaeological Deposits*, provide policy and procedures for the protection, evaluation, and coordination of cultural materials in the event they are inadvertently discovered at MSFC.

The Proposed Action was coordinated with the Alabama State Historic Preservation Office (SHPO) through letter correspondence (see Appendix C). In a reply letter dated January 6, 2012 (see Appendix C), SHPO stated the following regarding the Proposed Action: "Upon review of the information forwarded by your office, we agree with the EA's findings that based on earlier archaeological studies, sites 1Ma359 and 1Ma1167 will not be affected by the project activities. Therefore, no further archaeological investigations are warranted. However, while there are no structures on the project site, there are several adjacent structures and the EA does not address these structures. Please advise us if any of these structures are listed on the MSFC CRMP as National Register listed or eligible properties so we may determine if there will be any adverse visual effects." To address SHPO's comments, MSFC reviewed the current NRHP eligibility status of the buildings closest to the subject property, and contacted SHPO to discuss the comments received. The buildings closest to the subject property are Buildings 4602, 4622, 4623, 4628, and 4643. Based on the MSFC ICRMP, Building 4602 is new; Buildings 4622 and 4623 are ineligible for NRHP listing; and Buildings 4628 and 4643 need further research before any NRHP eligibility assessments are possible. None of these buildings would be directly or indirectly impacted under the Proposed Action. Based on the above information, SHPO issued a second letter dated January 31, 2011 (see Appendix C), which stated the following regarding the Proposed Action: "Thank you for responding to our questions regarding the structures adjacent to the proposed development site. Our review of the information forwarded by your office indicates there will be no affect to any structures listed on or eligible for the National Register of Historic Places (NRHP). Therefore, we can now concur with this project."

For these reasons, the Proposed Action is preliminarily expected to have no impact on cultural resources. When information on the actual development planning and design is available, assessment of the Proposed Action's potential impact on cultural resources may differ from this preliminary assessment.

#### **4.11.2 No-Action Alternative**

Under the No-Action Alternative, the subject property would not be leased or developed. Therefore, the No-Action Alternative would have no impact on cultural resources.

## 4.12 Socioeconomics

### 4.12.1 Proposed Action

The Proposed Action would involve the temporary hiring of contractor construction personnel and the permanent hiring of personnel who would operate/manage the retail services on the property. It can be reasonably assumed that non-local construction personnel would not permanently relocate to the area given that the construction work would be temporary. It can also be reasonably assumed that relatively few non-local permanent personnel would relocate to the local area to operate/manage the retail services given that most this labor force would likely be hired out of the local area. Based on this rationale, the Proposed Action is expected to involve few, if any, permanent personnel relocations into the local area. The Proposed Action would increase the number of permanent employees at MSFC; however, the overall increase in permanent employees at the Center would be relatively minor based on the amount of retail services expected to be operated. In summary, the Proposed Action would result in a minor increase in the number of permanent personnel working at MSFC, and potentially in a minor increase in the number of persons living in the local area.

Construction and retail services work under the Proposed Action would have a minor positive impact on the local economy. Direct expenditures for construction-related materials would benefit local suppliers and secondary spending by workers would benefit businesses near MSFC such as gas stations and restaurants. The Proposed Action would have a negligible impact on the total labor force and employment in the region as a result of the small number of jobs that would be created. The impact of construction work on the local economy and employment would be temporary.

For these reasons, the Proposed Action is preliminarily expected to have a minor positive impact on socioeconomics; the impact is preliminarily expected to not be significant. When information on the actual development planning and design is available, assessment of the Proposed Action's potential impact on socioeconomics may differ from this preliminary assessment.

### 4.12.2 No-Action Alternative

Under the No-Action Alternative, the subject property would not be leased or developed. Therefore, the No-Action Alternative would have no impact on socioeconomics.

## 4.13 Public and Occupational Health and Safety

### 4.13.1 Proposed Action

Under the Proposed Action, there is the potential for worker accidents to occur during construction activities as a result of routine workplace exposure to heavy equipment and debris. As discussed in Section 3.17, the groundwater beneath the subject property is contaminated and there is the potential for workplace exposure to this contaminated groundwater during construction work. To minimize the potential for accidents and exposure to contaminated groundwater, workers would be required to wear and use appropriate protective equipment and follow all applicable OSHA standards and procedures. Job Safety Assessments would be required to be prepared, and workers would

be required to review and sign these documents before working on the job site. Construction contractors and managers of the retail services would be responsible for ensuring that all their employees (and subcontractors) comply with all applicable OSHA regulations and for conducting their work in a manner that does not pose any risk to themselves or to MSFC personnel. Provided that all appropriate worker protection measures are taken and all applicable OSHA regulations and guidelines are followed, the potential for safety and occupational health impacts under the Proposed Action is expected to be low. Site safety measures that may be implemented on the subject property would be determined by the private developer during project design.

As discussed in Section 4.12.1, the Proposed Action would result in a minor increase in the number of permanent personnel working at MSFC. Therefore, the demand for medical, police, and fire-fighting services at MSFC would not significantly change under the Proposed Action.

For these reasons, the Proposed Action is preliminarily expected to have a minor impact on public and occupational health and safety; the impact is preliminarily expected to not be significant. When information on the actual development planning and design is available, assessment of the Proposed Action's potential impact on public and occupational health and safety may differ from this preliminary assessment.

#### **4.13.2 No-Action Alternative**

Under the No-Action Alternative, the subject property would not be leased or developed. Therefore, the No-Action Alternative would have no impact on public and occupational health and safety.

### **4.14 Utilities**

#### **4.14.1 Proposed Action**

Under the Proposed Action, the retail services that would be constructed on the subject property would be connected to onsite and nearby utility lines/systems. The Proposed Action may involve installation of new utility lines and modification/relocation of existing utility lines as needed for the retail development. The type and extent of the utility work would be determined by the private developer during the design phase of the project. The private developer would coordinate the design and construction of the utilities for the development with RSA and MSFC. The Army is expected to upgrade/replace the aboveground electrical lines and remove the aboveground steam line on the property in the near future. The developer and tenants of the proposed retail development would pay for all utilities used.

The Proposed Action would increase energy consumption, potable water consumption, and domestic wastewater generation at MSFC; however the overall increase in utility demand/usage at the Center would be relatively minor based on the amount of retail services expected to be operated on the property.

For these reasons, the Proposed Action is preliminarily expected to have a minor impact on utilities; the impact is preliminarily expected to not be significant. When information on the

actual development planning and design is available, assessment of the Proposed Action's potential impact on utilities may differ from this preliminary assessment.

#### **4.14.2 No-Action Alternative**

Under the No-Action Alternative, the subject property would not be leased or developed. Therefore, the No-Action Alternative would have no impact on utilities.

### **4.15 Solid Waste**

#### **4.15.1 Proposed Action**

Development of the subject property under the Proposed Action would generate nonhazardous, construction-related solid waste such as construction debris, rubble, and stripped vegetation. Construction solid waste would be disposed of at RSA's Construction Debris Landfill located south of Building 5678. Based on the amount of retail services expected to be operated on the property, the increase in refuse solid waste generation at MSFC would be relatively minor under the Proposed Action.

For these reasons, the Proposed Action is preliminarily expected to have a minor impact on solid waste; the impact is preliminarily expected to not be significant. When information on the actual development planning and design is available, assessment of the Proposed Action's potential impact on solid waste may differ from this preliminary assessment.

#### **4.15.2 No-Action Alternative**

Under the No-Action Alternative, the subject property would not be leased or developed. Therefore, the No-Action Alternative would have no impact on solid waste.

### **4.16 Traffic Flow**

#### **4.16.1 Proposed Action**

The Proposed Action is expected to involve the construction of one access road that connects the subject property to Martin Road, and potentially the construction of additional access roads that connect the property to one or more of the other existing adjacent roads. Martin Road is proposed to be widened to four lanes by the City of Huntsville by the end of 2012. The design for the widening of Martin Road is underway and the private developer would be responsible for coordinating with the City of Huntsville on the property's access connection to the redesigned Martin Road. At this time, one new traffic light is proposed at the intersection of Gemini Road and Martin Road to facilitate access to the property; additional traffic lights may also be added. At this time, the portion of Fowler Road that runs through the northeastern part of the property is expected to be removed by the developer. The private developer would be required to provide parking and loading spaces per the planning/design guidelines to be prepared by MSFC for the retail development.

At this time, the construction of access roads, potential construction of a traffic light(s), and removal of the portion of Fowler Road that runs through the property are not expected to have a significant impact on traffic flow around the property. The private developer would be required to plan and design the development in coordination with RSA, MSFC, and the

City of Huntsville to minimize the potential for traffic flow impacts. Provided that the developer meets these requirements, development of the property is expected to have a minor impact on traffic flow.

As discussed in Section 4.12.1, the Proposed Action would result in a minor increase in the number of permanent personnel working at MSFC, and potentially in a minor increase in the number of persons living in the local area. Therefore, there would be a minor increase in traffic levels at MSFC and potentially a minor increase in traffic levels in the local area under the Proposed Action. Construction activities under the Proposed Action would temporarily increase traffic at MSFC and in the local area. The projected increase in traffic is expected to be minor and traffic levels would return to current levels after the construction work is completed.

For these reasons, the Proposed Action is preliminarily expected to have a minor impact on traffic flow; the impact is preliminarily expected to not be significant. When information on the actual development planning and design is available, assessment of the Proposed Action's potential impact on traffic flow may differ from this preliminary assessment.

#### **4.16.2 No-Action Alternative**

Under the No-Action Alternative, the subject property would not be leased or developed. Therefore, the No-Action Alternative would have no impact on traffic flow.

### **4.17 Hazardous Materials and Wastes**

#### **4.17.1 Proposed Action**

As discussed in Section 3.17 and shown on Figure 3-2, the subject property is underlain by a chlorinated solvent plume. The groundwater plume under the subject property originated from sources (Source Areas) north of the property in the 4700 Area of MSFC. The plume under the property is not a Source Area and it has relatively low concentrations of CVOCs. Under MSFC's CERCLA Cleanup Program, the current remediation strategy for contaminated groundwater at the Center is to remediate Source Areas and to allow groundwater plumes outside Source Areas to attenuate naturally, with monitoring by MSFC (monitored natural attenuation). Therefore, no remediation of the groundwater plume under the subject property is expected to be required or conducted prior to development of the property. Development of the subject property is expected to have no effect on remediation of any Source Area. Prior to developing the property, the private developer would have to fulfill all the requirements of MSFC's CERCLA Site Access Control program, which includes completion and approval of a CERCLA Site Access Form/Checklist, among other requirements. At this time, it is expected that the private developer would be required to install vapor barriers in all buildings that are constructed on the property to prevent intrusion of CVOCs into the buildings.

Under the Proposed Action, the construction methods used to anchor building foundations as well as other construction activities that involve excavation have the potential to involve dewatering or other handling of groundwater (see Section 4.5.1). Given that the property is underlain by a chlorinated solvent plume, it is assumed that any groundwater that would be encountered during construction activities would be contaminated. In the event that

groundwater discharges to the surface or requires handling during construction, e.g., if dewatering is performed, the developer would be required to appropriately manage the groundwater in coordination with the MSFC EEOH Office, ADEM, and USEPA, and in accordance with the guidelines contained within the *Final Land Use Controls Remedial Design Project for Operable Unit 3: Groundwater* (NASA, 2009). The groundwater would be required to be containerized and then tested to determine if it contains CVOCs or any other contaminants. If the groundwater is determined to be contaminated, it would be required to be properly disposed of at a licensed offsite disposal facility. If the groundwater is not contaminated, it may be released onsite. Provided that the developer meets all the above requirements, construction activities under the Proposed Action are not expected to result in the release of contaminated groundwater to the environment and the potential human health risk associated with the handling of contaminated groundwater during construction activities under the Proposed Action are expected to be low. As discussed in Section 4.5.1, a significant amount of groundwater is not expected to be removed during construction activities under the Proposed Action. Therefore, the probability that construction activities would cause the chlorinated solvent plume beneath the property to migrate laterally is considered to be low.

As discussed in Section 3.17 and shown on Figure 3-3, there is a CERCLA site (MSFC-052) located in the northern part of the subject property. MSFC-052 is an industrial wastewater sewer pipeline that is currently being investigated as part of OU-2 (Industrial Sewer System). The sediments within the pipeline and the soils around portions of the pipeline are contaminated, primarily by arsenic. MSFC is currently conducting a Feasibility Study for OU-2 that includes a risk assessment and remediation plan. The preliminary remediation plan for MSFC-052 proposes grouting the entire pipeline, removing subsurface soil around portions of the pipeline, and cutting the pipeline manholes to below grade and filling them with grout. Remediation of the portion of MSFC-052 that is located on the subject property is expected to be implemented by MSFC as a time-critical action so it can be implemented before retail development of the property is initiated under the Proposed Action. MSFC would request approval from ADEM and USEPA for the time-critical action. Remediation activities on the property would need to be completed before the remediation area could be developed.

As discussed in Section 3.17 and shown on Figure 3-3, there is an EAC site located in the northeastern part of the subject property. This EAC site is currently being investigated as part of the OU-13 for potential contamination associated with potential releases from Building 4614 (Atmospheric Research Building), which is located in the northeastern part of the property. Based on the investigation and risk assessments conducted, no further investigation or remediation is recommended by MSFC for this EAC site. MSFC has submitted the draft final OU-13 RI report to ADEM and USEPA, and is waiting for comments from these agencies. Until regulatory agency concurrence is obtained, this part of the property could not be developed under the Proposed Action.

At this time, it is not known if Building 4614 contains any LBP, ACMs, or PCBs. There are no other known sources of these materials on the subject property. Building 4614 is planned to be demolished by MSFC prior to the development of the property. The demolition of this building is not part of the Proposed Action; therefore, any necessary management of LBP, ACMs, or PCBs during demolition of the building would not be the responsibility of the private developer under the Proposed Action.

Operation of some of the retail services on the property under the Proposed Action may involve handling and storage of hazardous materials; generation and storage of hazardous wastes; and use of USTs and/or ASTs. Examples of potential hazardous materials/wastes that may be associated with retail operations on the property include fuels (gas station), oils (car wash), solvents (dry cleaner), and metals (photo shop). Improper management of such materials/wastes may directly or indirectly impact soils, surface water, groundwater, and/or biological resources. To prevent such impacts, the developer would be required to manage all hazardous materials/wastes and USTs/ASTs in accordance with all applicable local, state, and federal laws and regulations, as well as with all applicable MSFC management plans and pollution prevention measures. More detailed discussion of the management of hazardous materials/wastes during retail operations on the subject property, including associated measures to prevent environmental impacts, would be required to be provided in separate NEPA documentation when information on the actual development planning and design is available.

The subject property is located within an area that is designated as Probability 5 - Unlikely for MEC. Based on the location of the subject property, a MEC sweep is not expected to be necessary prior to construction activities. The subject property is not located within any established QD at MSFC.

The Proposed Action was coordinated with the USEPA through letter correspondence (see Appendix C). In a reply email dated February 6, 2012 (see Appendix C), USEPA stated the following: "The EPA concurs with the Proposed Action Alternative to lease a 25.68-acre parcel, located on Marshall Space Flight Center (MSFC) by the Marshall Exchange to a private developer. This concurrence is contingent upon the results of future reviews and comments on NEPA documents. EPA's primary concern is with the contamination outlined in Figure 3-2, (Chlorinated Solvent Plume Beneath Marshall Exchange Lease Property). We look forward to reviewing and commenting on the methods in which Marshall Space Flight Center (MSFC) will mitigate /clean-up the site, prior to the proposed action". On February 13, 2010, MSFC corresponded with USEPA via phone and email to discuss their comments and MSFC's policies regarding groundwater plumes. As part of this correspondence, MSFC conveyed to USEPA that the groundwater plume under the subject property is not a Source Area; therefore, remediation of the plume is not expected to be required or conducted prior to property development per MSFC's current CERCLA Program remediation strategy, which involves active remediation of Source Areas and monitored natural attenuation of groundwater plumes outside Source Areas. MSFC also provided USEPA other relevant information on the issue and indicated that the relevant information would be added to the final EA. In a reply email dated February 14, 2012 (see Appendix C), USEPA stated the following: "EPA NEPA Program acknowledges and concurs with responses to comments (RTC) on the Marshall Exchange Retail Development Property Lease Project. The Response to Comments were satisfactorily addressed and should be annotated within the Final EA document".

For these reasons, the Proposed Action is preliminarily expected to have a minor impact on hazardous materials and wastes; the impact is preliminarily expected to not be significant. When information on the actual development planning and design is available, assessment of the Proposed Action's potential impact on hazardous materials and wastes may differ from this preliminary assessment.

### **4.17.2 No-Action Alternative**

Under the No-Action Alternative, the subject property would not be leased or developed. Therefore, the No-Action Alternative would have no impact on hazardous materials and wastes.

## **4.18 Environmental Justice and Protection of Children**

### **4.18.1 Proposed Action**

The Proposed Action is expected to have only minor impacts on the resources most relevant for assessing impacts on human populations, which are air quality, noise, groundwater quality, surface water quality, and hazardous materials/wastes. The minor impacts that the Proposed Action is expected to have on these resources is not expected to adversely affect human populations. Therefore, the Proposed Action is not expected to have disproportionately high or adverse human health or environmental effects on minority or low-income populations. During construction, the subject property would be secured against unauthorized entry; therefore, the Proposed Action is not expected to result in environmental health or safety risks to children.

For these reasons, the Proposed Action is preliminarily expected to have no impact on environmental justice or protection of children. When information on the actual development planning and design is available, assessment of the Proposed Action's potential impact on environmental justice and protection of children may differ from this preliminary assessment.

### **4.18.2 No-Action Alternative**

Under the No-Action Alternative, the subject property would not be leased or developed. Therefore, the No-Action Alternative would have no impact on environmental justice or protection of children.

## **4.19 Cumulative Impacts**

### **4.19.1 Proposed Action**

A "cumulative impact" is defined in 40 CFR 1508.7 as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions." Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

The Proposed Action would occur entirely within the boundaries of MSFC and would have little potential to interact with any private sector actions in the surrounding area. Based on planning schedules, one or more of the Center development projects identified in the 2003 MSFC 20-Year Facilities Master Plan may be implemented during the same time that the Proposed Action is implemented (NASA, 2003). The majority of the foreseeable development projects at MSFC would involve construction/demolition for facilities, utilities, and other infrastructure in existing developed areas and, therefore, would have environmental impacts largely limited to temporary increases in noise, air emissions, and

traffic. The planned development projects that have the potential to be implemented during the same time that the Proposed Action is implemented would not occur in the immediate vicinity of the subject property; therefore, there is little potential for adverse cumulative impacts on noise or air emissions to occur if the Proposed Action coincides with one or more of the planned projects. There is the potential for heavy traffic to occur if two or more construction/demolition projects are implemented at the same time; however, the cumulative impact would be temporary and could be minimized by making most or all MSFC access gates and routes available during the work period. Because the sites where the planned projects would occur are already mostly developed, adverse cumulative impacts to soils, vegetation, or habitat would not occur. The combined effect of the Proposed Action and foreseeable development projects at MSFC, regardless of their timing, would have positive cumulative impacts on the local economy resulting from short-term, temporary increases in employment and expenditures.

For these reasons, the Proposed Action is preliminarily expected to have minor cumulative impacts; the impacts are preliminarily expected to not be significant. When information on the actual development planning and design is available, assessment of the Proposed Action's potential cumulative impacts may differ from this preliminary assessment.

#### **4.19.2 No-Action Alternative**

Under the No-Action Alternative, the subject property would not be leased or developed. Therefore, the No-Action Alternative would have no cumulative impacts.

# Summary of Environmental Consequences and Conclusions

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## 5.1 Summary of Environmental Consequences

The potential environmental consequences of the Proposed Action and No-Action Alternative are summarized in Table 5-1. The potential environmental consequences presented in Table 5-1 for the Proposed Action are preliminary and based on the amount of information that is currently available for the proposed retail development. No information on the actual planning/design of the proposed development is yet available. Separate NEPA analysis and documentation will be required to provide a comprehensive and accurate assessment of the potential environmental impacts of the Proposed Action when information on the actual development planning and design is available. When information on the actual development planning and design is available, assessment of the Proposed Action's potential impacts may differ from those presented in Table 5-1.

**TABLE 5-1**

Summary of Environmental Consequences

*EA for the Marshall Exchange Retail Development Property Lease at MSFC*

| <b>Resource</b>                           | <b>Proposed Action</b> | <b>No-Action Alternative</b> |
|---|------------------------|------------------------------|
| Air Quality                               | MINOR IMPACT           | NO IMPACT                    |
| Noise                                     | MINOR IMPACT           | NO IMPACT                    |
| Topography                                | MINOR IMPACT           | NO IMPACT                    |
| Soils                                     | MODERATE IMPACT        | NO IMPACT                    |
| Geology and Hydrogeology                  | MINOR IMPACT           | NO IMPACT                    |
| Land Use                                  | MINOR IMPACT           | NO IMPACT                    |
| Surface Water                             | NEGLIGIBLE IMPACT      | NO IMPACT                    |
| Vegetation                                | MODERATE IMPACT        | NO IMPACT                    |
| Wildlife                                  | MODERATE IMPACT        | NO IMPACT                    |
| Listed and Sensitive Species              | NO IMPACT              | NO IMPACT                    |
| Cultural Resources                        | NO IMPACT              | NO IMPACT                    |
| Socioeconomics                            | MINOR IMPACT           | NO IMPACT                    |
| Public and Occupational Health and Safety | MINOR IMPACT           | NO IMPACT                    |
| Utilities                                 | MINOR IMPACT           | NO IMPACT                    |
| Solid Waste                               | MINOR IMPACT           | NO IMPACT                    |
| Traffic Flow                              | MINOR IMPACT           | NO IMPACT                    |
| Hazardous Materials and Wastes            | MINOR IMPACT           | NO IMPACT                    |
| Environmental Justice and                 | NO IMPACT              | NO IMPACT                    |

**TABLE 5-1**

Summary of Environmental Consequences

*EA for the Marshall Exchange Retail Development Property Lease at MSFC*

| <b>Resource</b>        | <b>Proposed Action</b> | <b>No-Action Alternative</b> |
|------------------------|------------------------|------------------------------|
| Protection of Children |                        |                              |
| Cumulative Impacts     | MINOR IMPACT           | NO IMPACT                    |

No Impact: The action would not cause a detectable change.

Negligible: The impact would be at the lowest level of detection; the impact would not be significant.

Minor: The impact would be slight but detectable; the impact would not be significant.

Moderate: The impact would be readily apparent; the impact would not be significant.

Major: The impact would be clearly adverse or positive; the impact has the potential to be significant. The significance of adverse and positive impacts is subject to interpretation and should be determined based on the final proposal. In cases of adverse impacts, the impact may be reduced to less than significant by mitigation, design features, and/or other measures that may be taken.

## 5.2 Conclusions

Based on the findings of this EA, the leasing and retail development of the subject property under the Proposed Action is preliminarily expected to not have a significant impact on the quality of the human or natural environment. No mitigation measures are preliminarily expected to be necessary for the Proposed Action. This EA supports a Finding of No Significant Impact for the Proposed Action. Accordingly, preparation of an Environmental Impact Statement is not required.

## SECTION 6

# References

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USEPA. 1971. *Noise from Construction Equipment and Operations, Building Equipment and Home Appliances*. Prepared by Bolt, Beranek, and Newman.

SECTION 7

# List of Preparers

---

| <b>Name</b>      | <b>Organization</b> | <b>Primary Responsibility</b>  |
|------------------|---------------------|--------------------------------|
| Ashley Boudreaux | NASA                | NASA Assistant Project Manager |
| Tunch Orsoy      | CH2M HILL           | CH2M HILL Project Manager      |
| Michael Reynolds | NASA                | NASA Project Manager           |

APPENDIX A

# **MSFC Director Authorization of Property Lease**



November 8, 2011

Reply to Attn of: DA01

MEMORANDUM FOR RECORD

TO: Distribution

FROM: DA01/Robert M. Lightfoot

SUBJECT: Approval to Use NASA Marshall Space Flight Center Controlled Land for a NASA Exchange-MSFC Retail Development Project

Introduction and Purpose

The NASA Exchange-MSFC, more commonly known as the Marshall Exchange, plans to provide private retail developers an opportunity to lease federal land controlled by NASA's Marshall Space Flight Center (MSFC), Redstone Arsenal, Alabama, in order to (1) provide food service and other quality of work life conveniences to support the NASA MSFC and surrounding Redstone Arsenal workforce; and (2) to generate non-appropriated funding for the Marshall Exchange to promote morale, welfare, and recreational activities and events for the wellbeing and overall health of Marshall employees.

Background

Constraints to federal spending have significantly reduced NASA's and Redstone's ability to construct non-mission related facilities, including cafeterias or space for concessionaire operations. For example, MSFC recently completed the construction of three buildings – two engineering office buildings and one laboratory building – to replace, modernize, and consolidate a number of old, deteriorated buildings. The three new buildings house more than 1,100 employees. However, a planned cafeteria for the new complex was cancelled due to higher than expected construction costs of the office buildings. As a result, the Marshall Exchange plans to pursue, through appropriate processes and approval authorities, a long term lease with a retail developer to construct, manage, and operate dining, fast food, gas station, and other convenience services to provide needed food services, improve the quality of work life, and reduce employee time away from work.

### Authority

NASA has the authority under 51 U.S.C. 20113(c) (National Aeronautics and Space Act) to lease NASA property to others and to provide, by contract or otherwise, for cafeterias and other necessary facilities for the welfare of employees of the Administration at its installations. The NASA Administrator has delegated authority to the Installation Center Director under NASA Policy Directive (NPD) 9050.6J – “A Center Director may authorize the use of NASA-controlled real property and existing facilities for Exchange operations, provided that such use does not interfere with official business or involve activities with the potential to release hazardous substances to the environment for which NASA (as the real property owner) is ultimately liable.” Furthermore, NASA Exchanges have the authority to use and acquire real property and facilities to achieve Exchange objectives (NPD 9050.6J Paragraph 1.c.(4)).

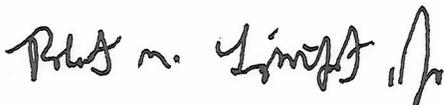
### Reviews and Concurrences

The Office of Center Operations / Facilities Engineering Office identified an area on the western boundary and near the north-south geographic center of MSFC that is suitable for such a development. The location is easily accessible, consistent and compliant with MSFC's Facilities Master Plan, and does not interfere with any other mission or official business use. The property is located on the south side of Martin Road west of Building 4602, and consists of approximately 25.68 acres within a lease area defined by the property's right-of-way boundaries (Enclosure 1). Furthermore, MSFC's Office of the Chief Counsel has reviewed the planned development and legal authorities, and concurs with the planned development.

An independent market and business case analysis was conducted for the property by the U.S. Army Corps of Engineers that indicated high potential as a successful retail development site based on ease of access, existing utilities infrastructure, and shortage of on-site food services.

### Approval

Based on these reviews, I hereby authorize the Marshall Exchange to pursue and develop a long term (approx. 35 years) lease agreement with a retail developer to develop the land area bounded by the right-of-ways shown on the attached site plan (Enclosure 1) and further identified in the attached legal description (Enclosure 2) for submission to NASA Headquarters' for final lease approval.



Robert M. Lightfoot  
Director

Enclosures

Distribution:

DD01/Gene Goldman  
DE01/Robin Henderson  
AS01/Ann McNair  
AS01/Robert Devlin  
AS10/Ed Kiessling  
AS10/Mike Reynolds  
AS20/Tim Corn  
AS21/Roslin Hicks  
AS21/Debbie Hendon  
AS21/Kent Criswell  
HS01/Tereasa Washington  
HS01/Digna Carballosa  
HS01/Edwin Jones  
LS01/Jim Frees  
LS01/Patricia Watson  
RS01/Pam Hanes  
NASA HQ/LD030/Frank Bellinger  
NASA HQ/LD030/Joe Flores  
NASA HQ/LD030/Calvin Williams  
NASA HQ/MB000/Mark Batkin



## Enclosure 2: Legal Description

Property approved for use for the Marshall Exchange Retail Development Project is located on federal property controlled by Marshall Space Flight Center (MSFC) and is also located in parts of Section 36 Township 4 South Range 2 West and Section 31 Township 4 South Range 1 West, Madison County, Alabama of the Huntsville Meridian and Baseline. Where coordinates are indicated in this Description, they are Alabama State Plane Coordinates East Zone, North American Datum (NAD) 1983. MSFC Drawing FAC-MX-CF-C1 (Enclosure 1) shows general topographic relief, known utilities, and environmental features within the described Lease Line. Right of Way(s) (ROW) in this description are for land use control only; they are not property lines. More particularly from the point of beginning, being Marshall Space Flight Center (MSFC) GPS Control Point A9-6G, a USCOE Monument with Brass Cap with Coordinates 1508671.74 feet Northing and 400521.63 feet Easting, proceed on grid bearing North 85 degrees 56 minutes 27 seconds East a distance of 333.27 feet to Point A, the True Point of Beginning for the Marshall Exchange Retail Development Lease Line with Coordinates 1508695.33 feet Northing and 400854.06 feet Easting; from the said True Point of Beginning proceed on Lease Line a grid bearing of North 18 degrees 02 minutes 17 seconds West a distance of 679.41 feet to Point B, that intersects with Martin Road South Right of Way (ROW) and Lease Line with Coordinates 1509341.35 feet Northing and 400643.68 feet; from said Point B proceed along Martin Road South ROW and Lease Line on grid bearing North 76 degrees 04 minutes 36 seconds East a distance of 1263.07 feet to Point C that intersects West ROW of Gemini Road and Lease Line with coordinates 1509644.91 feet Northing and 401868.19 Easting; from said Point C proceed along West Gemini ROW and Lease Line a grid Bearing South 01 degree 16 minutes 50 seconds West a distance of 158.01 feet to Point D that is also a Point of Curvature (PC) on West Gemini ROW and Lease Line with coordinates 1509486.94 feet Northing and 401864.65 feet Easting; from said Point D proceed along Westerly Gemini ROW and Lease Line a circular arc distance of 647.09 feet to Point E that is also the Point of tangent (PT) on the Westerly Gemini Road ROW and Lease Line; said Circular Arc has radius of 500.00 feet on Westerly side of a 613.48 feet chord on grid bearing South 30 degrees 57 minutes 31 seconds East; said Point E coordinates are 1508960.86 feet Northing and 402180.24 feet Easting; from said Point E proceed along Southern ROW of Gemini/Fowler Road and Lease Line on grid bearing South 65 degrees 32 minutes 57 seconds East a distance of 655.28 feet to Point F that intersects with Northern Centaur Street ROW and Lease Line with coordinates 1508689.64 feet Northing and 402776.75 feet Easting; from said Point F proceed along North Centaur Street ROW and Lease Line on grid bearing of North 89 degrees 49 minutes 49 seconds West a distance of 1922.70 feet to the True Point of Beginning.

The Described Lease Line of the Marshall Exchange Retail Development Site contains 25.68 acres, more or less.

APPENDIX B

# Public Involvement

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# The Huntsville Times

## ADVERTISING AFFIDAVIT

Account Number

0110846

Order Number

0000265250

Date

December 19, 2011

Ch2m Hill  
Tunch Orsoy  
4350 W Cypress Street Ste 600  
Tampa, FL 33607

| Date       | Position | Description                             | P.O. Number    | Ad Size   | Total Cost |
|------------|----------|---|----------------|-----------|------------|
| 12/18/2011 | Legal    | NOTICE OF PUBLIC COMMENT PERIOD FOR THE | MSFC Public No | 1 x 124 L | 228.84     |

NOTICE OF PUBLIC COMMENT PERIOD FOR THE DRAFT ENVIRONMENTAL ASSESSMENT AND DRAFT FINDING OF NO SIGNIFICANT IMPACT

Marshall Exchange Retail Development Property Lease at George C. Marshall Space Flight Center NATIONAL AERONAUTICS AND SPACE ADMINISTRATION GEORGE C. MARSHALL SPACE FLIGHT CENTER  
The U.S. National Aeronautics and Space Administration, George C. Marshall Space Flight Center (MSFC) announces publication of the draft Environmental Assessment (EA) and draft Finding of No Significant Impact (FONSI) for the Marshall Exchange Retail Development Property Lease at MSFC. The draft EA and draft FONSI are available for public review at the NASA External Relations Office at MSFC, and at the following branches of the Huntsville-Madison County Public Library:  
**Main Branch** - 915 Monroe St., Huntsville, AL 35801, Phone: (256) 532-5940  
**Madison Branch** - 130 Plaza Blvd., Madison, AL 35758, Phone: (256) 461-0046  
To receive copies of the draft EA and draft FONSI, contact AS10/Mr. Michael Reynolds, Environmental Engineering and Occupational Health Office, NASA Marshall Space Flight Center, AL 35812, phone: (256) 544-9606, e-mail: Michael.L.Reynolds@nasa.gov or CS30/Ms. Sharon Cobb, Manager, External Relations Office, NASA Marshall Space

Flight Center, AL 35812, phone: (256) 544-7791, e-mail: Sharon.Cobb@nasa.gov. Comments for consideration by NASA on the draft EA and draft FONSI should be provided in writing by mail or e-mail to Mr. Michael Reynolds or to Ms. Sharon Cobb. These documents will have a 30-day comment period, which will start on December 18, 2011 and end on January 16, 2012. Written substantive comments received within the review period will be addressed.

Dec. 18, 2011

### STATE OF ALABAMA MADISON COUNTY

Before me, Brandi Cook, a Notary Public in and for Said State, personally appeared Mecia kCarlson, known to me, who being by me first duly sworn, deposes and said person is a Legal Advertising Representative of the Huntsville Times, a newspaper published and printed at Huntsville, Madison County, Alabama, and that the attached legal notice was published in said newspaper on:

12/18/2011

*Mecia Carlson*

Legal Advertising Representative

Sworn to before me this the

19th day of December 2011

*Brandi Cook*

Notary Public

My Commission expires October 04, 2014

APPENDIX C

# **Regulatory Agency Correspondence**

---

Gallimore Comments.txt

From: Reynolds, Michael L. (MSFC-AS10) [michael.l.reynolds@nasa.gov]  
Sent: Wednesday, January 18, 2012 2:29 PM  
To: Orsoy, Tunch/TPA  
Subject: FW: Comments for MSFC EUL EA (UNCLASSIFIED)  
Attachments: EISA Section 438\_SW-LID guidance.pdf; LIDsSec438.pdf; ADEM.NPDES GP Info\_MSFC.pdf

-----Original Message-----

From: Reynolds, Michael L. (MSFC-AS10)  
Sent: Tuesday, January 10, 2012 1:01 PM  
To: Tunch.Orsoy@CH2M.com  
Subject: FW: Comments for MSFC EUL EA (UNCLASSIFIED)

First round of comments from RSA.

-----Original Message-----

From: Gallimore, Renee CTR US USA [mailto:renee.gallimore@us.army.mil]  
Sent: Tuesday, January 10, 2012 11:04 AM  
To: Reynolds, Michael L. (MSFC-AS10)  
Subject: Comments for MSFC EUL EA (UNCLASSIFIED)

Classification: UNCLASSIFIED  
Caveats: NONE

Hi Mike, just wanted to send you my comments. Please forward the appropriate/applicable information to your folks over there, as you see fit.

. I didn't see this mentioned anywhere in there, but the site/building designs should be in compliance with EISA Section 438 (see attachments). A lot of these requirements will coincide with LID practices, but since I didn't see this in the EA, I thought I would forward it to you, FYI. Also, I attached some general information on ADEM stormwater permitting.

. Utilities - not sure how all that is going to work out. The developers will have lots of headaches with this. Hopefully, the design folks/developers will look into this very early in the process.

Sincerely,  
Renee

Renee Gallimore  
Environmental Scientist

Gallimore Comments.txt

DPW Engineering Division  
US Army Garrison - Redstone  
4488 Martin Road  
Redstone Arsenal, AL 35898  
256-842-9713

Classification: UNCLASSIFIED  
Caveats: NONE

**REVIEW COMMENTS**

***Marshall Exchange  
Preliminary Draft EA  
Redstone Arsenal, Alabama***

**January 2012**

| <b>#</b> | <b>Page</b> | <b>Section</b> | <b>Reviewer</b> | <b>Comment</b>   | <b>Response</b>  |
|----------|-------------|----------------|-----------------|--|--|
| 1.       | Throughout  | Throughout     | Ben Hoksbergen  | Given the proximity to the two archaeological sites and the significance of Site 1Ma1167 in particular, I would recommend more thorough delineation of archaeological deposits in this area. In reviewing the survey report (Alexander and Alvey 2006), there were a lot of shovel tests that were not excavated in the vicinity. As a result, it appears that the east boundary of 1Ma1167 and the north boundary of 1Ma359 were inadequately delineated and may extend into the APE for the Marshall Exchange. | The Proposed Action was coordinated with the Alabama SHPO through letter correspondence (see Appendix C). In a reply letter dated January 6, 2012, SHPO stated the following regarding the Proposed Action: "Upon review of the information forwarded by your office, we agree with the EA's findings that based on earlier archaeological studies, sites 1Ma359 and 1Ma1167 will not be affected by the project activities. Therefore, no further archaeological investigations are warranted." Based on SHPO's comments, MSFC currently does not plan to conduct additional investigations of the two archaeological sites. MSFC welcomes further discussion with RSA regarding past and potential future investigations of the two archaeological sites. The point-of-contact at MSFC for such discussions is Ms. Ashley Boudreaux, who can be reached at (256) 544-5573. The private developer would be required to implement SOP #4 of the MSFC ICRMP in the event that cultural materials are discovered during construction activities. |
| 2.       | 2-7         | 2.2.1          | Clayton Vaughan | Alternatives eliminated include incompatible land uses because they would have to be changed to accommodate the new use. But the land use at the preferred site also will have to be changed, which negates the use of that argument for eliminating other alternatives. Recommend reconsidering this argument.  | While it is true that the land use of the subject property will have to be changed, the subject property is not designated for future mission use as are the two alternative sites. Master planning personnel at MSFC have determined that the property is suitable to support retail services, and that its retail development would have no adverse effect on current land uses or future land-use planning at MSFC. In contrast, retail development of the other two sites would adversely impact future mission functions which are planned for those areas. Moreover, the two alternative sites are not suitable with respect to factors other than land use (see Section 2.2.1).   |
| 3.       | 3-4         | 3.5            | Clayton Vaughan | It is stated that the operation of the retail services on the subject property is not expected to involve any activity that  | Further discussion of these issues has been added to Section 4.17. This discussion includes the example potential  |

| <b>#</b> | <b>Page</b> | <b>Section</b> | <b>Reviewer</b> | <b>Comment</b>  | <b>Response</b>   |
|----------|-------------|----------------|-----------------|---|---|
|          |             |                |                 | would affect groundwater quantity. However, of the proposed uses, a gas station could release gasoline; a car wash could release oils, metals, etc.; photo shops may discharge metals; dry cleaners may discharge solvents. Recommend including an explanation of how these operations would not affect groundwater.  | impacts provided in the comment and how impacts would be prevented. The section has also been revised to state that more detailed discussion of the management of hazardous materials/wastes during retail operations on the subject property, including associated measures to prevent environmental impacts, would be required to be provided in separate NEPA documentation when information on the actual development planning and design is available. |
| 4.       | 3-5 – 3-7   | 3.8            | Greg Hicks      | EA says, "Pine plantations are areas where pines have been planted for harvest. Loblolly pine is the only pine species that is planted at MSFC." The areas planted in the subject area have not been planted with loblolly pine and were likely planted only to cut down on maintenance costs. The pines planted in this area are likely a non-native Asian species which may have been planted experimentally to determine that species' feasibility as a commercial tree. Some volunteer loblolly pine have begun growing in this area and are now overtopping the non-native pine species. | The EA has been revised to indicate that the pine that has been planted on the subject property is likely a non-native species that may have been planted experimentally to determine that species' feasibility as a commercial tree.   |
| 5.       | 3-7         | 3.8            | Justin Pflueger | Shortleaf pine should be added to the list of pine species planted and managed on post.   | The EA does not speak to the species planted at RSA, only to those planted at MSFC. Per Mr. Greg Hicks/RSA Forester, loblolly pine is the only pine species planted at MSFC for harvest. MSFC acknowledges that other species may be planted at RSA.  |
| 6.       | 3-8         | 3.9            | Shannon Allen   | Should include scientific names of all animals, especially since it is done for all of the plant species in section 3.8.  | The EA has been revised accordingly.  |
| 7.       | 3-10        | 3.10           | Shannon Allen   | There is an additional Tuscumbia darter population and subsequent ESA, Jaya Springs ESA, found between Hale and Martins roads on the north and south, and Rideout road on the east. This population was inadvertently discovered in the fall of 2010 and a full population study will begin in 2012. This information should change para 2 on pg 3-10 to say that there are two locations of Tuscumbia darter and that there are 8 ESA on RSA.  | Jaya Spring is not located on MSFC; therefore, the referenced paragraph is correct as is. However, for clarity, the referenced paragraph has been revised to mention that the Tuscumbia darter is also known to occur in Jaya Spring and that there are a total of 8 ESAs on RSA, including the Williams Spring ESA which is located on MSFC.   |
| 8.       | 3-13        | 3.14           | Greg Calvert    | EA says, "RSA's main steam plant is the City of Huntsville Plant, Ogden Martin Systems." Should read "RSA's main steam plant is the City of Huntsville Solid Waste Disposal Authority (SWDA) Steam Plant, operated by Covanta Energy Corporation."  | The EA has been revised accordingly.  |
| 9.       | 4-7         | 4.8.1          | Shannon Allen   | Any landscaping must meet the 3:1 native:nonnative ratio to comply with Garrison Policy and other federal laws, act, executive orders and Army policies (can be provided at   | The following paragraph has been added to Section 4.8.1 to address this comment: "The landscaping plan for the subject property must meet the minimum 3:1 native to non-  |

| #   | Page      | Section      | Reviewer        | Comment  | Response   |
|-----|-----------|--------------|-----------------|--|--|
|     |           |              |                 | request). Call Garrison Ecologist (876-3977) for suitable plant list or suggestions.   | native planting ratio per U.S. Army Garrison Policy 200-6 implemented at RSA, and it must not include any species that is on the RSA "Do Not Plant" list."   |
| 10. | 4-7       | 4.8.1        | Greg Hicks      | The area of proposed action that is likely to involve tree clearing should be done with the coordination of the RSA forestry program manager to determine any merchantability of forest products.  | The following sentence has been added to Section 4.8.1 to address this comment: "Tree clearing on the subject property must be conducted in coordination with the RSA forestry program manager to determine any merchantability of forest products."   |
| 11. | 4-7 – 4-8 | 4.8.1, 4.9.1 | Justin Pflueger | Those are not loblolly pine trees. So the habitat evaluation was conducted with the wrong canopy dominant species. It is repeated that pine forests are poor wildlife habitats. Maybe that is written to justify the proposed actions but there are too many studies to mention that state pine forests are among the most diverse land types in the country.  | The EA has been revised to indicate that (per Greg Hicks) RSA expects that the pine that has been planted on the subject property is likely a non-native species that may have been planted experimentally to determine that species' feasibility as a commercial tree. Section 4.9.1 does not speak to the quality of State pine forests in general. Instead, it speaks to the wildlife habitat quality of the forests on the subject property. Based on the findings of the September 2010 ecological survey, the entire subject property area provides poor quality wildlife habitat. The pine plantation, pine forest, and fallow field habitats on the property rated low on many of the criteria used to evaluate wildlife habitat quality during the survey. Other aspects of the property, including its location, fragmentation, and connectivity to other habitats also diminish the quality of wildlife habitat that is provided by the property. |
| 12. | 4-10      | 4.10.1       | Shannon Allen   | There is an additional Tuscumbia darter population and subsequent ESA, Jaya Springs ESA, found between Hale and Martins roads on the north and south, and Rideout road on the east. This population was inadvertently discovered in the fall of 2010 and a full population study will begin in 2012. This information should change para 1 on pg 4-10 to say that there are two locations of Tuscumbia darter. | Section 4.10.1 has been revised to mention that the Tuscumbia darter is also known to occur in Jaya Spring located on RSA.   |
| 13. | 4-10      | 4.10.1       | Shannon Allen   | para 3, sent 2: what about gray bat foraging? More than just migration important to the species.   | Given that gray bats prefer to forage in riparian zones and only over water, this issue was not considered to be relevant with respect to the subject property. For clarity, Section 4.10.1 has been revised to indicate that the proposed action would have no impact on gray bat foraging.   |
| 14. | 4-10      | 4.10.1       | Shannon Allen   | para 3, sent 3: this statement is in direct conflict with statements made in the geology section 4.5.1 sent 2 "The construction methods used to anchor building foundations as well as other construction activities have the potential to   | The referenced paragraph in Section 4.10.1 primarily speaks to surface water flow (stormwater runoff), which is directionally driven via gravity. MSFC acknowledges that groundwater flow at the Center is not as straightforward.   |

| #   | Page    | Section | Reviewer        | Comment  | Response  |
|-----|---------|---------|-----------------|--|---|
|     |         |         |                 | <p>impact the subsurface geological formations and groundwater beneath the subject property. Construction methods that have been used to anchor building foundations at MSFC." You cannot potentially impact the groundwater in one section and then not in another. Unless there is proof that the water from the spring doesn't come from downstream, you cannot make the argument. Groundwater flow in Karst areas is often complicated and there are many examples of groundwater movement "upstream" in relation to surface water.</p>  | <p>However, Section 4.5.1 concludes that the proposed action would have little to no impact on groundwater. Certainly any minor removal of groundwater during building construction would have no potential to impact any downstream or upstream spring.</p>                  |
| 15. | 4-10    | 4.10.1  | Shannon Allen   | <p>para 3, sent 8: Assuming "that oil/water separators and all other storm water pollution prevention equipment/features would be constructed and operated for any gas station, car wash, or other facility for which they are required" is not adequate for legal requirements. Document must state that they are required or that they "will" be utilized for any construction.</p>  | <p>The EA has been revised accordingly.</p>   |
| 16. | General |         | Ramzi Makkouk   | <p>Once the contractor gets the construction permit, please have them provide the Garrison with the followings: A copy of the previously submitted document(s) to ADEM--- Notice of Intent (NOI), Topographic map for the designated site, Best Management Practices Plan and a Comprehensive Spill Prevention Control &amp; Countermeasures as part of the CBMPP. Please include a copy of the NOI Received (The construction general permit) with the package. Please forward a copy of the requested information to my attention: US Army Garrison, Environmental Management Division (IMSE-RED-PWE, Ramzi Makkouk), Building 4488 Martin Road.</p> | <p>Acknowledged.</p>  |
| 17. | General |         | Renee Gallimore | <p>The site/building designs should be in compliance with EISA Section 438 (<i>This comment was submitted by Ms. Renee Gallimore to Mr. Mike Reynolds/MSFC via email on January 10, 2012</i>).</p>   | <p>Section 4.7.1 has been revised to indicate that the site development would be required to be designed in compliance with Section 438 of the EISA. Supporting discussion on this topic has also been added to the section. The FONSI has also been revised accordingly.</p> |



STATE OF ALABAMA  
ALABAMA HISTORICAL COMMISSION  
468 SOUTH PERRY STREET  
MONTGOMERY, ALABAMA 36130-0900

FRANK W. WHITE  
EXECUTIVE DIRECTOR

TEL: 334-242-3184  
FAX: 334-240-3477

January 31, 2012

Ashley Boudreaux  
NASA  
George C. Marshall Space Flight Center  
Marshall Space Flight Center, Alabama 35812

Re: AHC 12-0494  
EA for Marshall Exchange Retail Development  
Madison County, Alabama

Dear Ms. Boudreaux:

Thank you for responding to our questions regarding the structures adjacent to the proposed development site. Our review of the information forwarded by your office indicates there will be no affect to any structures listed on or eligible for the National Register of Historic Places (NRHP). Therefore, we can now concur with this project.

We appreciate your continued efforts on this project. Should you have any questions, please contact Greg Rhinehart at (334) 230-2662. Please have the AHC tracking number referenced above available and include it with any correspondence.

Truly yours,

Elizabeth Ann Brown  
Deputy State Historic Preservation Officer

EAB/GCR/gcr



STATE OF ALABAMA  
ALABAMA HISTORICAL COMMISSION  
468 SOUTH PERRY STREET  
MONTGOMERY, ALABAMA 36130-0900

FRANK W. WHITE  
EXECUTIVE DIRECTOR

TEL: 334-242-3184  
FAX: 334-240-3477

January 6, 2012

Edward H. Kiessling  
NASA  
George C. Marshall Space Flight Center  
Marshall Space Flight Center, Alabama 35812

Re: AHC 12-0494  
EA for Marshall Exchange Retail Development  
Madison County, Alabama

Dear Mr. Kiessling:

Upon review of the information forwarded by your office, we agree with the EA's findings that based on earlier archaeological studies, sites IMa359 and IMa1167 will not be affected by the project activities. Therefore, no further archaeological investigations are warranted. However, while there are no structures on the project site, there are several adjacent structures and the EA does not address these structures. Please advise us if any of these structures are listed on the MSFC CRMP as National Register listed or eligible properties so we may determine if there will be any adverse visual effects.

We appreciate your efforts on this project. Should you have any questions, please contact Greg Rhinehart at (334) 230-2662. Please have the AHC tracking number referenced above available and include it with any correspondence.

Truly yours,

A handwritten signature in black ink, reading "Elizabeth Ann Brown", with a long horizontal flourish extending to the right.

Elizabeth Ann Brown  
Deputy State Historic Preservation Officer  
EAB/GCR/gcr

USEPA Comments.txt

From: Larry Gissentanna [Gissentanna.Larry@epamail.epa.gov]  
Sent: Tuesday, February 14, 2012 3:29 PM  
To: Orsoy, Tunch/TPA  
Cc: brian.roberson@nasa.gov; Glasgow, Jason/MGM;  
michael.l.reynolds@nasa.gov; sharon.cobb@nasa.gov  
Subject: RE: Marshall Exchange Retail Development Property Lease at George  
C. Marshall Space Flight Center Draft EA and Draft FONSI

Mr Orsoy,

EPA NEPA Program acknowledges and concurs with responses to comments (RTC) on the Marshall Exchange Retail Development Property Lease Project. The Response to Comments were satisfactory addressed and should be annotated within the Final EA document. Also, please include in your references any documents that contain the details of the information provided in your response. If you have any additional questions or comments, let me know.

Thanks,  
Larry Gissentanna  
NEPA Program  
404-562-8248

-----<Tunch.Orsoy@CH2M.com> wrote: -----  
To: Larry Gissentanna/R4/USEPA/US@EPA  
From: <Tunch.Orsoy@CH2M.com>  
Date: 02/13/2012 04:53PM  
Cc: <sharon.cobb@nasa.gov>, <michael.l.reynolds@nasa.gov>,  
<brian.roberson@nasa.gov>, <Jason.Glasgow@CH2M.com>  
Subject: RE: Marshall Exchange Retail Development Property Lease at George C. Marshall  
Space Flight Center Draft EA and Draft FONSI

Mr. Gissentanna,

Thanks very much for taking the time today to discuss your comments on the Marshall Exchange EA. MSFC appreciates your concurrence on the Proposed Action and acknowledges that your continued concurrence on implementation of the Proposed Action is contingent on your review of future NEPA documentation that will be prepared when information on the actual site design is available.

To be able to move forward in completing the current EA, MSFC wanted to specifically address your comment regarding mitigation/clean up of the groundwater plume underlying the site prior to site development. The following

USEPA Comments.txt

is a summary of our discussion of this issue, including some additional relevant information for further understanding of MSFC's policies regarding groundwater plumes.

- The MSFC CERCLA Cleanup Program is being administered under the Federal Facility Agreement which EPA is a signatory party.
- Groundwater at MSFC is currently being investigated as part of Operable Unit 3 and is monitored semi-annually.
- NASA controls access to CERCLA sites through a site access program such that the proper measures are implemented for requested or anticipated future land use based on the contamination present and the associated risks that have been calculated and described in Remedial Investigation Reports.
- The MSFC Site access program process includes a Site Access Control Form, which is signed by EPA.
- The groundwater plume under the lease area is a bedrock upwelling from sources to the north of the property in the 4700 Area of MSFC. That is, the plume under the property is not a "Source Area" and it has low concentrations of CVOCs.
- The current remediation strategy for groundwater at MSFC is to remediate the Source Areas, and to allow plumes outside the Source Areas to naturally attenuate, with monitoring by MSFC.
- As discussed in the EA, structures constructed on the lease property will be installed with vapor barriers to prevent vapor intrusion from the plume.
- The proposed development would have no effect on remediation of any Source Area.
- Any groundwater that is encountered during site development would be properly managed in accordance with all applicable regulations and policies, as discussed in the EA.

Any relevant information above not already included in the draft EA will be added to the final EA. The final EA will also include your comments and all associated documented correspondence with you regarding your comments.

MSFC would appreciate your acknowledgement that your comments have been satisfactorily addressed and that you concur with the manner in which MSFC plans to undertake the Proposed Action with regard to the groundwater plume underlying the lease property - a reply to this email will be sufficient and appreciated. MSFC looks forward to coordinating with you on future NEPA documentation that is planned to be prepared for the Proposed Action.

Sincerely,

Tunch Orsoy  
EA Project Manager  
CH2MHILL

(727) 698-8945

-----Original Message-----

From: COBB, SHARON D (MSFC-CS30) [mailto:sharon.cobb@nasa.gov]  
Sent: Monday, February 06, 2012 1:34 PM  
To: Orsoy, Tunch/TPA; Reynolds, Michael L. (MSFC-AS10)  
Subject: FW: Marshall Exchange Retail Development Property Lease at George C. Marshall Space Flight Center Draft EA and Draft FONSI

Tunch, Mike,

I received the following response to the EA. Will you provide a response to Mr. Gissentanna?

Sharon

-----Original Message-----

From: Larry Gissentanna [mailto:Gissentanna.Larry@epamail.epa.gov]  
Sent: Monday, February 06, 2012 12:04 PM  
To: COBB, SHARON D (MSFC-CS30)  
Subject: Marshall Exchange Retail Development Property Lease at George C. Marshall Space Flight Center Draft EA and Draft FONSI

Dear Ms. Sharon Cobb,

Consistent with the U.S. Environmental Protection Agency's (EPA) Clean Air Act (CAA) § 309 and National Environmental Policy Act (NEPA) § 102 (2)(C) responsibilities, EPA has reviewed the above identified draft FONSI and draft EA. EPA Region IV appreciates the opportunity to review and comment on this NEPA document.

EPA understand that this proposed action is to lease property to a private developer in order to construct an on-site retail development. This development will include food/convenience services to improve the quality of work life, and reduce employee time away from work and to generate revenue for the Marshall Exchange through the leasing and retail development of the subject property. Recent limits on federal spending have significantly reduced NASA's ability to construct non-mission related facilities, including cafeterias and facilities for concessionaire operations. The proposed development of the subject property would potentially include full service restaurants, fast food restaurants, a gas station, a car wash, a credit union/bank, County license department, and

retail stores such as dry cleaners, printing/photo shops, gift shops, and a shipping store (UPS/FedEx).

EPA further understands that the scope of this EA does not address the actual development conditions and associated potential environmental impacts on this site, and a separate NEPA analysis and documentation will be provided in a more comprehensive and accurate assessment of the potential environmental impacts of the proposed action at a later date.

Based on the information provided in this EA, EPA's primary concern is with the contamination outlined in Figure 3-2, (Chlorinated Solvent Plume Beneath Marshall Exchange Lease Property). We look forward to reviewing and commenting on the methods in which Marshall Space Flight Center (MSFC) will mitigate /clean-up the site, prior to the proposed action.

Based upon our review, it appears that most of the major issues, e.g., noise, wetlands, and water/air quality, and environmental justice have been adequately assessed in this EA. The EPA concurs with the Proposed Action Alternative to lease a 25.68-acre parcel, located on Marshall Space Flight Center (MSFC) by the Marshall Exchange to a private developer. This concurrence is contingent upon the results of future reviews and comments on NEPA documents. All future NEPA documents, tiered from this EA, should be sent to the address below.

Remember to keep the local community informed and involved throughout the project process; by having community meetings and/ or updating the community through local media (radio, local paper and TV).

Please forward an electronic copy (CD) of your Final Environmental Assessment and future NEPA documents to:

Environmental Protection Agency - Region 4 Sam Nunn Atlanta Federal Center  
Attn: NEPA Program Office, 13th Fl  
61 Forsyth Street, SW  
Atlanta, GA 30303

Thank you again for the opportunity to comment

Larry O. Gissentanna  
DoD and Federal Agency, Project Manager  
NEPA Program Office  
U.S. Environmental Protection Agency/ Region 4  
61 Forsyth Street, SW  
Atlanta, GA 30303-8960  
Office: 404-562-8248  
gissentanna.larry@epa.gov

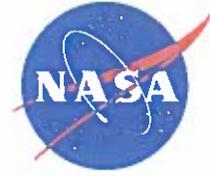
## EA Mailing List

|    |   |
|----|---|
| 1  | Mr. Terry Hazle<br>AMSAM-RA-DEM<br>Building 4488<br>Redstone, Arsenal, AL 35898   |
| 2  | Honorable Paul Finley<br>Mayor of Madison<br>100 Hughes Road<br>Madison, AL 35758   |
| 3  | Representative (District 6) Phil Williams<br>2185 Old Monrovia Road<br>Huntsville, AL 35806   |
| 4  | Alabama State Clearinghouse<br>Department of Economic and Community<br>PO Box 5690<br>Montgomery, AL 36103-5690                         |
| 5  | Senator (District 9) Clay Scofield<br>Room 731<br>State House<br>11 South Union Street<br>Montgomery, AL 36130                          |
| 6  | Representative (District 21) Jim Patterson<br>P.O. Box 286<br>Meridianville, AL, AL 35759   |
| 7  | Honorable Mary Caudle<br>Mayor of Trina<br>640 Sixth Street<br>Triana, AL 35758   |
| 8  | Congressman Mo Brooks<br>5 <sup>th</sup> Congressional District of Alabama<br>2101 Clinton Avenue, West STE 302<br>Huntsville, AL 35805 |
| 9  | Elizabeth Ann Brown, Deputy SHPO<br>Alabama Historical Commission<br>468 South Perry Street<br>Montgomery, AL 36130-0900                |
| 10 | Gwendolyn Keyes, Regional Administrator<br>Environmental Protection Agency<br>Region IV<br>61 Forsyth St., SW<br>Atlanta, GA 30303      |

|    |   |
|----|---|
| 11 | Honorable Mike Gillespie, Chairman<br>Madison County Commission<br>Madison County Courthouse<br>100 North Side Square<br>Huntsville, AL 35801 |
| 12 | Senator (District 8) Shadrack McGill<br>Room 731<br>State House<br>11 South Union Street<br>Montgomery, AL 36130                              |
| 13 | NASA/MSFC<br>Mail Code CS20<br>ATTN: Mr. Mike Wright<br>MSFC, AL 35812  |
| 14 | Wheeler National Wildlife Refuge<br>2700 Refuge Headquarters Road<br>Decatur, AL 35603  |
| 15 | NASA/MSFC<br>Mail Code CS20<br>ATTN: Mr. Dom Amatore<br>MSFC, AL 35812  |
| 16 | Lance R. LeFleur, Director<br>Alabama Department of Environmental Management<br>1400 Coliseum Blvd.<br>Montgomery, AL 36110-2059              |
| 17 | Representative (District 20) Howard Sanderford<br>908 Tannahill Dr SE<br>Huntsville, AL 35802   |
| 18 | Honorable Tommy Battle<br>Mayor of Huntsville<br>P.O. Box 308<br>308 Fountain Circle<br>Huntsville, AL 35801                                  |
| 19 | Senator Jeff Sessions<br>200 Clinton Ave. NW<br>Regions Center STE 802<br>Huntsville, AL 35801  |
| 20 | Representative (District 19) Laura Hall<br>726 Madison Street<br>Huntsville, AL 35801   |
| 21 | Senator (District 2) Bill Holtzclaw<br>P.O. Box 1801<br>Madison, AL 35758   |
| 22 | Representative (District 10) Mike Ball<br>P.O. Box 6302<br>Huntsville, AL 35824   |

|    |   |
|----|---|
| 23 | Senator (District 3) Arthur Orr<br>P.O. Box 305<br>Decatur, AL 35602            |
| 24 | Senator (District 7) Paul Sanford<br>726 Madison Street<br>Huntsville, AL 35801 |
| 25 | Senator Richard Shelby<br>1000 Glenn Hearn Blvd. #20127<br>Huntsville, AL 35842 |

National Aeronautics and Space Administration  
George C. Marshall Space Flight Center  
Marshall Space Flight Center, AL 35812



December 16, 2011

Reply to Attn of: AS10 (16-12)

Mr. Dom Amatore  
NASA/MSFC  
Mail Code CS20  
MSFC, AL 35812

Dear Dom Amatore:

The draft Environmental Assessment (EA) and draft Finding of No Significant Impact (FONSI) for the Marshall Exchange retail development property lease at George C. Marshall Space Flight Center (MSFC) have been prepared and are being made available to the public and to Federal, State, and local entities for a 30-day review and comment period. Please find enclosed a CD containing electronic copies of the documents.

The proposed action involves the leasing of a 25.68-acre parcel located on MSFC by the Marshall Exchange to a private developer. The leasing and privately-funded retail development of the property is intended to provide food and other convenience services for the workforce of MSFC and surrounding Redstone Arsenal and to generate revenue for the Marshall Exchange, which has the mission of providing morale, welfare, and recreational activities and events for the well being of MSFC employees.

To receive hardcopies or additional electronic copies of the draft EA and draft FONSI, please contact AS10/Mr. Michael Reynolds, Environmental Engineering and Occupational Health Office, NASA Marshall Space Flight Center, AL 35812, phone: 256-544-9606, e-mail: [Michael.L.Reynolds@nasa.gov](mailto:Michael.L.Reynolds@nasa.gov) or CS30/Ms. Sharon Cobb, Manager, External Relations Office, NASA Marshall Space Flight Center, AL 35812, phone: 256-544-7791, e-mail: [Sharon.Cobb@nasa.gov](mailto:Sharon.Cobb@nasa.gov). Comments on the draft EA and draft FONSI must be provided in writing by mail or e-mail to Mr. Michael Reynolds or to Ms. Sharon Cobb and must be postmarked within 30 days from the date of this letter.

Sincerely,

A handwritten signature in cursive script that reads "Edward H. Kiessling".

Edward H. Kiessling  
Manager  
Environmental Engineering and Occupational Health Office

Enclosure

National Aeronautics and Space Administration  
George C. Marshall Space Flight Center  
Marshall Space Flight Center, AL 35812



December 16, 2011

Reply to Attn of: AS10 (16-12)

The Honorable Mike Ball  
Alabama State Representative  
P.O. Box 6302 (District 10)  
Huntsville, AL 35824

Dear Mr. Ball:

The draft Environmental Assessment (EA) and draft Finding of No Significant Impact (FONSI) for the Marshall Exchange retail development property lease at George C. Marshall Space Flight Center (MSFC) have been prepared and are being made available to the public and to Federal, State, and local entities for a 30-day review and comment period. Please find enclosed a CD containing electronic copies of the documents.

The proposed action involves the leasing of a 25.68-acre parcel located on MSFC by the Marshall Exchange to a private developer. The leasing and privately-funded retail development of the property is intended to provide food and other convenience services for the workforce of MSFC and surrounding Redstone Arsenal and to generate revenue for the Marshall Exchange, which has the mission of providing morale, welfare, and recreational activities and events for the wellbeing of MSFC employees.

To receive hardcopies or additional electronic copies of the draft EA and draft FONSI, please contact AS10/Mr. Michael Reynolds, Environmental Engineering and Occupational Health Office, NASA Marshall Space Flight Center, AL 35812, phone: 256-544-9606, e-mail: [Michael.L.Reynolds@nasa.gov](mailto:Michael.L.Reynolds@nasa.gov) or CS30/Ms. Sharon Cobb, Manager, External Relations Office, NASA Marshall Space Flight Center, AL 35812, phone: 256-544-7791, e-mail: [Sharon.Cobb@nasa.gov](mailto:Sharon.Cobb@nasa.gov). Comments on the draft EA and draft FONSI must be provided in writing by mail or e-mail to Mr. Michael Reynolds or to Ms. Sharon Cobb and must be postmarked within 30 days from the date of this letter.

Sincerely,

A handwritten signature in cursive script that reads "Edward H. Kiessling".

Edward H. Kiessling  
Manager  
Environmental Engineering and Occupational Health Office

Enclosure

National Aeronautics and Space Administration  
George C. Marshall Space Flight Center  
Marshall Space Flight Center, AL 35812



December 16, 2011

Reply to Attn of: AS10 (16-12)

Honorable Tommy Battle  
Mayor of Huntsville  
P.O. Box 308  
308 Fountain Circle  
Huntsville, AL 35801

Dear Mayor Battle:

The draft Environmental Assessment (EA) and draft Finding of No Significant Impact (FONSI) for the Marshall Exchange retail development property lease at George C. Marshall Space Flight Center (MSFC) have been prepared and are being made available to the public and to Federal, State, and local entities for a 30-day review and comment period. Please find enclosed a CD containing electronic copies of the documents.

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Sincerely,

A handwritten signature in cursive script that reads "Edward H. Kiessling".

Edward H. Kiessling  
Manager  
Environmental Engineering and Occupational Health Office

Enclosure

National Aeronautics and Space Administration  
**George C. Marshall Space Flight Center**  
Marshall Space Flight Center, AL 35812



December 16, 2011

Reply to Attn of: AS10 (16-12)

Congressman Mo Brooks  
5th Congressional District of Alabama  
2101 Clinton Avenue, West STE 302  
Huntsville, AL

Dear Congressman Brooks:

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Edward H. Kiessling  
Manager  
Environmental Engineering and Occupational Health Office

Enclosure

National Aeronautics and Space Administration  
George C. Marshall Space Flight Center  
Marshall Space Flight Center, AL 35812



December 16, 2011

Reply to Attn of: ASI0 (16-12)

Honorable Mary Caudle  
Mayor of Triana  
640 Sixth Street  
Triana, AL 35758

Dear Mayor Caudle:

The draft Environmental Assessment (EA) and draft Finding of No Significant Impact (FONSI) for the Marshall Exchange retail development property lease at George C. Marshall Space Flight Center (MSFC) have been prepared and are being made available to the public and to Federal, State, and local entities for a 30-day review and comment period. Please find enclosed a CD containing electronic copies of the documents.

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Edward H. Kiessling  
Manager  
Environmental Engineering and Occupational Health Office

Enclosure

National Aeronautics and Space Administration  
George C. Marshall Space Flight Center  
Marshall Space Flight Center, AL 35812



December 16, 2011

Reply to Attn of:

AS10 (16-12)

Alabama State Clearinghouse  
Department of Economic and Community  
P.O. Box 5690  
Montgomery, AL 36103-5690

Dear Clearinghouse:

The draft Environmental Assessment (EA) and draft Finding of No Significant Impact (FONSI) for the Marshall Exchange retail development property lease at George C. Marshall Space Flight Center (MSFC) have been prepared and are being made available to the public and to Federal, State, and local entities for a 30-day review and comment period. Please find enclosed a CD containing electronic copies of the documents.

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Edward H. Kiessling  
Manager  
Environmental Engineering and Occupational Health Office

Enclosure

National Aeronautics and Space Administration  
George C. Marshall Space Flight Center  
Marshall Space Flight Center, AL 35812



December 16, 2011

Reply to Attn of:

AS10 (16-12)

Honorable Paul Finley  
Mayor of Madison  
100 Hughes Road  
Madison, AL 35758

Dear Mayor Finley:

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Edward H. Kiessling  
Manager  
Environmental Engineering and Occupational Health Office

Enclosure

National Aeronautics and Space Administration  
George C. Marshall Space Flight Center  
Marshall Space Flight Center, AL 35812



December 16, 2011

Reply to Attn of:

AS10 (16-12)

Honorable Mike Gillespie, Chairman  
Madison County Commission  
Madison County Courthouse  
100 North Side Square  
Huntsville, AL

Dear Mike Gillespie:

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Edward H. Kiessling  
Manager  
Environmental Engineering and Occupational Health Office

Enclosure

National Aeronautics and Space Administration  
George C. Marshall Space Flight Center  
Marshall Space Flight Center, AL 35812



December 16, 2011

Reply to Attn of:

AS10 (16-12)

Representative (District 19) Laura Hall  
726 Madison Street  
Huntsville, AL 35801

Dear Representative Hall:

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Edward H. Kiessling  
Manager  
Environmental Engineering and Occupational Health Office

Enclosure

National Aeronautics and Space Administration  
George C. Marshall Space Flight Center  
Marshall Space Flight Center, AL 35812



December 16, 2011

Reply to Attn of:

AS10 (16-12)

Mr. Terry Hazle  
AMSAM-RA-DEM  
Building 4488  
Redstone Arsenal, AL 35898

Dear Terry Hazle:

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Edward H. Kiessling  
Manager  
Environmental Engineering and Occupational Health Office

Enclosure

National Aeronautics and Space Administration  
George C. Marshall Space Flight Center  
Marshall Space Flight Center, AL 35812



December 16, 2011

Reply to Attn of: AS10 (16-12)

Senator (District 2) Bill Holtzclaw  
P.O. Box 1801  
Madison, AL 35758

Dear Senator Holtzclaw:

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Edward H. Kiessling  
Manager  
Environmental Engineering and Occupational Health Office

Enclosure

National Aeronautics and Space Administration  
George C. Marshall Space Flight Center  
Marshall Space Flight Center, AL 35812



December 16, 2011

Reply to Attn of:

AS10 (16-12)

Lance R. LeFleur, Director  
Alabama Department of Environmental Management  
1400 Coliseum Blvd.  
Montgomery, AL 36110-2059

Dear Lance R. LeFleur:

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Manager  
Environmental Engineering and Occupational Health Office

Enclosure

National Aeronautics and Space Administration  
George C. Marshall Space Flight Center  
Marshall Space Flight Center, AL 35812



December 16, 2011

Reply to Attn of:

AS10 (16-12)

Senator (District 8) Shadrack McGill  
Room 731  
State House  
11 South Union Street  
Montgomery, AL 36130

Dear Senator McGill:

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Environmental Engineering and Occupational Health Office

Enclosure

National Aeronautics and Space Administration  
George C. Marshall Space Flight Center  
Marshall Space Flight Center, AL 35812



December 16, 2011

Reply to Attn of:

AS10 (16-12)

Senator (District 3) Arthur Orr  
P.O. Box 305  
Decatur, AL 35602

Dear Senator Orr:

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Manager  
Environmental Engineering and Occupational Health Office

Enclosure

National Aeronautics and Space Administration  
George C. Marshall Space Flight Center  
Marshall Space Flight Center, AL 35812



December 16, 2011

Reply to Attn of: AS10 (16-12)

Representative (District 21) Jim Patterson  
P.O. Box 286  
Meridianville, AL, AL 35759

Dear Representative Patterson:

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Edward H. Kiessling  
Manager  
Environmental Engineering and Occupational Health Office

Enclosure

National Aeronautics and Space Administration  
George C. Marshall Space Flight Center  
Marshall Space Flight Center, AL 35812



December 16, 2011

Reply to Attn of:

AS10 (16-12)

Refuge Manager  
Wheeler National Wildlife Refuge  
2700 Refuge Headquarters Road  
Decatur, AL 35603

Dear Refuge Manager:

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Manager  
Environmental Engineering and Occupational Health Office

Enclosure

National Aeronautics and Space Administration  
George C. Marshall Space Flight Center  
Marshall Space Flight Center, AL 35812



December 16, 2011

Reply to Attn of:

AS10 (16-12)

Representative (District 20) Howard Sanderford  
908 Tannahill Dr SE  
Huntsville, AL 35802

Dear Representative Sanderford:

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Manager  
Environmental Engineering and Occupational Health Office

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National Aeronautics and Space Administration  
George C. Marshall Space Flight Center  
Marshall Space Flight Center, AL 35812



December 16, 2011

Reply to Attn of:

AS10 (16-12)

Senator (District 7) Paul Sanford  
726 Madison Street  
Huntsville, Alabama 35801

Dear Senator Sanford:

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Sincerely,

A handwritten signature in cursive script that reads "Edward H. Kiessling".

Edward H. Kiessling  
Manager  
Environmental Engineering and Occupational Health Office

Enclosure

National Aeronautics and Space Administration  
George C. Marshall Space Flight Center  
Marshall Space Flight Center, AL 35812



December 16, 2011

Reply to Attn of: AS10 (16-12)

Senator (District 9) Clay Scofield  
Room 731  
State House  
11 South Union Street  
Montgomery, AL 36130

Dear Senator Scofield:

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National Aeronautics and Space Administration  
George C. Marshall Space Flight Center  
Marshall Space Flight Center, AL 35812



December 16, 2011

Reply to Attn of:

AS10 (16-12)

Senator Jeff Sessions  
200 Clinton Ave. NW  
Regions Center STE 802  
Huntsville, AL 35801

Dear Senator Sessions:

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National Aeronautics and Space Administration  
George C. Marshall Space Flight Center  
Marshall Space Flight Center, AL 35812



December 16, 2011

Reply to Attn of:

AS10 (16-12)

Senator Richard Shelby  
1000 Glenn Hearn Blvd. #20127  
Huntsville, AL 35842

Dear Senator Shelby:

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Environmental Engineering and Occupational Health Office

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National Aeronautics and Space Administration  
George C. Marshall Space Flight Center  
Marshall Space Flight Center, AL 35812



December 16, 2011

Reply to Attn of:

AS10 (16-12)

Elizabeth Ann Brown, Deputy SHPO  
Alabama Historical Commission  
468 South Perry Street  
Montgomery, AL 36130-0900

Dear Elizabeth Ann Brown:

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Environmental Engineering and Occupational Health Office

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National Aeronautics and Space Administration  
George C. Marshall Space Flight Center  
Marshall Space Flight Center, AL 35812



December 16, 2011

Reply to Attn of:

AS10 (16-12)

Representative (District 6) Phil Williams  
2185 Old Monrovia Road  
Huntsville, AL 35806

Dear Representative Williams:

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Enclosure

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George C. Marshall Space Flight Center  
Marshall Space Flight Center, AL 35812



December 16, 2011

Reply to Attn of:

AS10 (16-12)

Mr. Mike Wright  
NASA/MSFC  
Mail Code CS20  
MSFC, AL 35812

Dear Mike Wright:

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National Aeronautics and Space Administration  
George C. Marshall Space Flight Center  
Marshall Space Flight Center, AL 35812



December 16, 2011

Reply to Attn of: AS10 (16-12)

Gwendolyn Keyes, Regional Administrator  
Environmental Protection Agency  
Region IV  
61 Forsyth St., SW  
Atlanta, GA 30303

Dear Gwendolyn Keyes:

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