



**NATIONAL BIO AND AGRO-DEFENSE FACILITY**  
Science and Technology Directorate/Office of National Laboratories



# **NATIONAL BIO AND AGRO-DEFENSE FACILITY**

## **FINAL ENVIRONMENTAL IMPACT STATEMENT**

### **EXECUTIVE SUMMARY**

**DECEMBER 2008**

**U.S. DEPARTMENT OF HOMELAND SECURITY**

## COVER SHEET

**LEAD AGENCY:** U.S. Department of Homeland Security (DHS)

**CONSULTING AGENCY:** U.S. Department of Agriculture

**PROPOSED ACTION:** To site, construct, and operate the National Bio and Agro-Defense Facility (NBAF) in the United States.

**POTENTIALLY AFFECTED LOCATIONS:** The NBAF site alternatives considered are; South Milledge Avenue Site in Athens, Georgia; Manhattan Campus Site in Manhattan, Kansas; Flora Industrial Park Site in Flora, Mississippi; Plum Island Site in Plum Island, New York; Umstead Research Farm Site in Butner, North Carolina; and, Texas Research Park Site in San Antonio, Texas.

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**TITLE:** National Bio and Agro- Defense Facility Final Environmental Impact Statement (NBAF FEIS)

**ABSTRACT:** This environmental impact statement presents an evaluation of the DHS proposal to site, construct and operate the NBAF. Operation of the NBAF as a biosafety level-3 (BSL-3) and BSL-4 research facility would allow basic and advanced research, diagnostic testing and validation, countermeasure development, and diagnostic training for addressing high-consequence livestock diseases to U.S. agriculture and public health. Six alternative NBAF sites are evaluated in the DEIS: Athens, Georgia; Manhattan, Kansas; Flora, Mississippi; Plum Island, New York; Butner, North Carolina; and, San Antonio, Texas. The No Action Alternative of not constructing and operating the NBAF is also analyzed. Resource areas analyzed for comparative effects include land use, infrastructure, air quality, noise, geology, water, biological and cultural resources, and socioeconomics, traffic, waste management, and health and safety. DHS specifically considered major issues raised in public comments during the DEIS scoping period, including concerns about building the NBAF in a densely populated area, impacts on resources, especially water, and site-specific issues. Since the proposal could involve construction and operation activities at any of the site alternatives, there were many common areas of potential effects among the sites. For example, NBAF operations at any of the sites could result in increased use of sanitary sewer, electrical power, potable water, and other utilities. Best management practices during construction and compliance with regulatory permit requirements would be expected to minimize effects of increases or potential increases in resource areas such as noise, traffic, air, emissions, soil disturbance, vegetation, and storm water runoff. Evaluation of each alternative also includes measures to mitigate risk from accidental or intentional releases. The Notice of Availability (NOA) for this FEIS was published in the *Federal Register* on December 12, 2008. DHS has identified the Preferred Alternative as the Manhattan Campus site alternative. The Record of Decision (ROD) will be published no sooner than 30 days after the date of the NOA. The ROD will present the DHS decision and the reasons for the decision, on whether or not to build the NBAF; where to build the NBAF (the Preferred Alternative); mitigation measures adopted to avoid or minimize environmental harm from the alternative selected, and, if they were not adopted, why not. Individual names and addresses (including e-mail addresses) received as part of comment documents on the NBAF Final EIS will be part of the public record and subject to disclosure. Any person wishing to have his/her name, address, or other identifying information withheld from public release must state this request in the comment document.

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**LIST OF ACRONYMS**

BSL	BioSafety Level
DHS	U.S. Department of Homeland Security
EIS	Environmental Impact Statement
NBAF	National Bio and Agro-Defense Facility
NEPA	<i>National Environmental Policy Act</i>
PIADC	Plum Island Animal Disease Center
USDA	U.S. Department of Agriculture

## EXECUTIVE SUMMARY

### 1.0 INTRODUCTION

The United States needs to update and expand its facilities to study the range of foreign animal diseases that are potential threats to U.S. agriculture.<sup>1</sup> The U.S. Department of Homeland Security (DHS) has proposed to augment existing capabilities through the construction and operation of the National Bio and Agro-Defense Facility (NBAF). Operation of this biosafety level 3 (BSL-3) and BSL-4 research facility would enable basic and advanced research, diagnostic testing and validation, countermeasure development (i.e., vaccines and anti-viral therapies), and diagnostic training for high-consequence livestock diseases with potentially devastating impacts to U.S. agriculture and public health.

#### What is the Proposed Action?

The U.S. Department of Homeland Security has proposed to augment the United States' existing foreign animal disease research capabilities through construction and operation of the National Bio and Agro-Defense Facility at one of six alternative sites.

The DHS Plum Island Animal Disease Center (PIADC), where much of the current research on foreign animal diseases is performed, is an essential component of the national strategy for protecting U.S. agriculture from an accident or a bioterrorist attack involving introduction of viruses such as foot and mouth disease. However, PIADC was built in the 1950s and is nearing the end of its lifecycle. The NBAF would fulfill the need for a secure U.S. facility that could support collaborative efforts among researchers from federal and state agencies and academia.

#### *Why does the United States need the NBAF?*

The global marketplace, increased imports of agricultural products, and growing numbers of international travelers to the United States have increased the number of pathways for the introduction of foreign and invasive agricultural pests and diseases. More than 40 contagious foreign animal diseases are currently recognized as threats to the U.S. agricultural economy<sup>2</sup>.

DHS's Proposed Action to site, construct, and operate the NBAF would allow researchers to study foreign animal and zoonotic diseases (transmitted from animals to humans) in the United States. U.S. researchers currently use similar facilities in Winnipeg, Canada, and Geelong, Australia. However, those facilities do not have the capacity to address outbreak scenarios in the United States in a timely manner and cannot guarantee their availability to meet U.S. research requirements. The NBAF would enable DHS and the U.S. Department of Agriculture (USDA) to fulfill their respective missions of detecting, preventing, protecting against, and responding to an accidental or intentional release of a foreign animal disease within the United States.

Agriculture is the largest industry and employer in the United States, generating more than \$1 trillion in economic activity annually, including more than \$50 billion in exports. U.S. agriculture is threatened by the entry of foreign pests and pathogens that could harm the economy, the environment, plant and animal health, and public health<sup>3</sup>. A key component of this economy is the livestock industry, which contributes over \$100 billion annually to the gross domestic product<sup>4</sup>. Diseases affecting livestock could have significant

<sup>1</sup> Homeland Security Presidential Directive 9, "Defense of United States Agriculture and Food".

<sup>2</sup> U.S. Government Accountability Office. 2003. Bioterrorism: A Threat to Agriculture and the Food Supply. GAO-04-259T. Testimony Before the Committee on Governmental Affairs, US, U.S. Senate Statement for the Record by Lawrence J. Dyckman, Director Natural Resources and Environment. Washington, DC.

<sup>3</sup> U.S. Government Accountability Office. 2005. Plum Island Animal Disease Center. DHS and USDA Are Successfully Coordinating Current Work, but Long-Term Plans Are Being Assessed. GAO-06-132. Washington, DC.

<sup>4</sup> U.S. Government Accountability Office. 2005a. Report to Congressional Requesters. Homeland Security. Much Is Being Done to Protect Agriculture From a Terrorism Attack, but Important Challenges Remain. GAO-05-214. Washington, DC.

impacts on the U.S. economy and consumer confidence in the food supply<sup>5</sup>. The introduction of animal and plant diseases at the farm level would cause severe economic disruption given that agriculture accounts for 13% of the U.S. gross domestic product and 18% of domestic employment.

***What diseases would be studied at the NBAF?***

DHS anticipates that the NBAF initially would focus BSL-3Ag research on African swine fever, classical swine fever, contagious foot and mouth disease, Japanese encephalitis, and Rift Valley fever, viruses and bovine pleuropneumonia, a bacteria. BSL-4 research would focus on Hendra and Nipah viruses.

The NBAF research mission would be based on current pathogen and disease risk assessments, subject to change as threats and risk assessments change.

***Why is this environmental impact statement being prepared?***

The *National Environmental Policy Act* (NEPA) requires federal agencies to examine the impacts of their proposed actions before decisions are made. DHS published a Notice of Intent to prepare an environmental impact statement (EIS) and hold public scoping meetings in the *Federal Register* on July 31, 2007.

The objectives of this EIS are to:

- State the underlying purpose and need for the DHS Proposed Action to site, design, construct, and operate the NBAF;
- Describe the Proposed Action and identify the six site alternatives that satisfy the purpose and need for DHS action;
- Describe the baseline environmental conditions at the six potential site locations;
- Analyze the potential indirect, direct, and cumulative effects to the existing environment from implementation of the Proposed Action at each potential site location;
- Describe and analyze the No Action Alternative (i.e., maintain current research capability at PIADC and do not build the proposed NBAF);
- Compare the effects from implementation of the Proposed Action to design, construct, and operate the NBAF with the effects of the No Action Alternative; and
- Compare the environmental effects at each site alternative;
- Identify and Recommend the Preferred Alternative.

**What are biosafety levels?**

Four biosafety levels are used to define the types of facilities, protective equipment, and administrative controls needed to conduct research on pathogens. Each level is meticulously designed to prevent lab-acquired infections and to protect the environment from potentially hazardous pathogens.

BSL-1. Special containment equipment or facility design is not required. There is minimal potential hazard to persons or the environment.

BSL-2. Facilities appropriate for handling indigenous agents of moderate risk to personnel and the environment.

BSL-3. Facilities appropriate for handling pathogens of indigenous or exotic origin with a known potential for aerosol transmission.

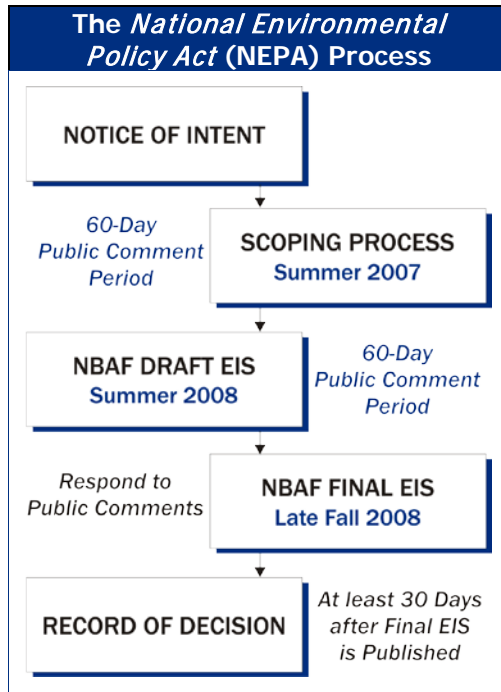
BSL-3E. Refers to the protective enhancements commensurate with the risk assessment of the pathogens and requirements for agricultural protection.

BSL-3Ag. Refers to research involving large agricultural animals and foreign and emerging pathogens that may cause serious consequences in livestock but are not harmful to humans because protective measures are available.

BSL-4. Facilities appropriate for handling exotic pathogens that pose a high risk of life-threatening disease in animals and humans through the aerosol route and for which there is no known vaccine or therapy.

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<sup>5</sup> See footnote 2.



The EIS also provides DHS with environmental information that can be used to develop mitigation actions, if necessary, to minimize or avoid adverse effects to the quality of the human environment and natural ecosystems from the implementation of the Proposed Action or continuation of the No Action Alternative.

## 2.0 DESCRIPTION OF THE PROPOSED NBAF

The proposed NBAF would consist of two laboratory facilities and four outbuildings. One of the two laboratory buildings would be the primary research building containing the BSL-2, BSL-3E, BSL-3Ag, and BSL-4 laboratories with associated support spaces. The other building would be a laboratory for small-scale vaccine and reagent production. It would be located adjacent to the primary research laboratory. Other outbuildings would include a central utility plant, an entry guard house, a central receiving facility, and parking. The approximate area needed for the NBAF is between 500,000 and 520,000 square feet. The approximate breakdown (percentage) by area is provided in Table ES-1.

**Table ES-1 — NBAF Space Requirements**

Space	Percent of Total Area
Office/Administrative	6.9
BSL-2 <sup>a</sup>	6.0
BSL-3 <sup>b</sup>	73.8
BSL-4	10.9
Production Module	2.4

<sup>a</sup> BSL-2 includes laboratory and support areas.

<sup>b</sup> BSL-3 includes laboratory, 3Ag, and training and support areas.

The NBAF would provide state-of-the-art operating procedures and biocontainment features to minimize the potential for laboratory-acquired infections and accidental releases. Primary biocontainment measures include, but are not limited to: high-efficiency particulate air filtration for air exhaust and air intake systems, biosafety cabinets, pressurized biosafety suits, and decontamination stations. Safety and biocontainment protocols would be addressed in facility-specific standard operating procedures that would be developed prior to commissioning and operation of the NBAF according to USDA guidelines. In addition, laboratory areas, animal areas, support areas, backup computer servers, and engineering systems would have 100% redundancy.

Construction of the NBAF could start in early 2010 and take approximately 4 years to complete. It would either be operated directly by the government or operated by a contractor with strict government oversight.

Once the NBAF reaches its life expectancy, DHS may choose to decommission the facility and transition the property for future use. Standard decontamination protocols would be performed according to the Biosafety in Microbiological and Biomedical Laboratories to ensure the health and safety of the workers and the public. Site-specific protocols and a decontamination and decommissioning plan would be developed. The plan would address decontamination methodologies; disposition of used equipment; re-use, disposal, or salvaging of site materials; and post-decontamination monitoring, among other factors.

### 3.0 DEVELOPMENT OF REASONABLE ALTERNATIVES

Congress appropriated money for site selection and other pre-construction activities for the NBAF but, because it did not designate a specific site upon which to build and construct the facility, DHS implemented a site selection process. DHS issued a Public Notice soliciting Expressions of Interest for potential NBAF sites in the *Federal Business Opportunities* on January 17, 2006, and in the *Federal Register* on January 19, 2006. Based on the 29 submissions received by the March 31, 2006 deadline, DHS conducted an initial evaluation using four evaluation criteria developed by an interagency working group:

- Proximity to Research Capabilities
- Proximity to Workforce
- Acquisition/Construction/Operations
- Community Acceptance

The evaluation criteria were intended to ensure that the NBAF would be located in an environmentally suitable site that meets the purpose and need of the project. It would also need to meet the interdependent needs of DHS and USDA to adequately protect the nation against biological threats to animal agriculture. In the first round evaluation, three committees comprised of federal employees evaluated submissions by site proponents, assessing strengths, weaknesses, and deficiencies against the evaluation criteria and associated sub-criteria. Based on the committees' conclusions, a federal steering committee recommended sites to the DHS selection authority, who then selected 18 sites with qualifications to be considered further. Eleven sites were eliminated from further consideration due to weaknesses and/or deficiencies, including:

- Lack of proximity to existing BSL-3 or BSL-4 research programs that could be linked to the NBAF mission requirements.
- Difficulty in demonstrating ability to attract world-class researchers and scientists or skilled technical workforce with necessary experience.
- Insufficient infrastructure, utilities, or other siting difficulties.
- Insufficient community support.

In December 2006, DHS requested more information from the 18 sites still under consideration and communicated preferences that would be considered by the evaluation committee in the second round of the site selection process. DHS preferences included location within a research community with programs in areas related to the NBAF mission; proximity to skilled technical staff and related training programs; title to at least a 30-acre site deeded at no cost or minimal cost to the government; potential for all NBAF construction to occur at the site; willingness to support to the NEPA process; contributions such as deeded land, new utilities, roads, and chilled and steamed water; demonstration of local and national stakeholder support or lack of opposition; and environmental suitability.

Upon receipt of the requested information, DHS and USDA evaluation committee representatives visited the sites to verify the information provided, to see any observable physical conditions and constraints, and to view the sites' utilities and infrastructure.

Based on analysis of the additional information and observations on the site visits, the evaluation team recommended that five sites, deemed to meet the evaluation criteria and DHS preferences, advance as reasonable alternatives to be studied in the EIS.

Although it was not part of the competitive site selection process, Plum Island was also determined to be a reasonable alternative site for study in the EIS, making a total of six sites for consideration. The reasons for including Plum Island as an alternative were:



- The Plum Island Site, currently owned by DHS, meets the NEPA definition of a reasonable alternative;
- PIADC, which is located at Plum Island, currently performs research similar to that proposed for the NBAF and has a workforce that assesses potential threats from foreign animal and zoonotic diseases;
- PIADC fulfills some of the goals and mission identified for the NBAF; and
- The Plum Island Site meets some of the NBAF site evaluation criteria and could be internally evaluated throughout the EIS process given that DHS already owns Plum Island.

The six site alternatives were identified in the *Federal Register* on July 31, 2007, as those that would be analyzed in the NBAF EIS (in addition to the No Action Alternative). The sites are shown in Figure ES-1.

#### 4.0 ALTERNATIVES EVALUATED IN THE NBAF EIS

Under the No Action Alternative, the NBAF would not be constructed. The work currently being conducted at PIADC, which performs much of the research on foreign animal and zoonotic diseases in the U.S., would continue. However, PIADC has facility limitations, such as its lack of any BSL-4 space, and aging facilities and infrastructure. Improvements and facility replacements would be required for PIADC to maintain its ability to perform current mission requirements.

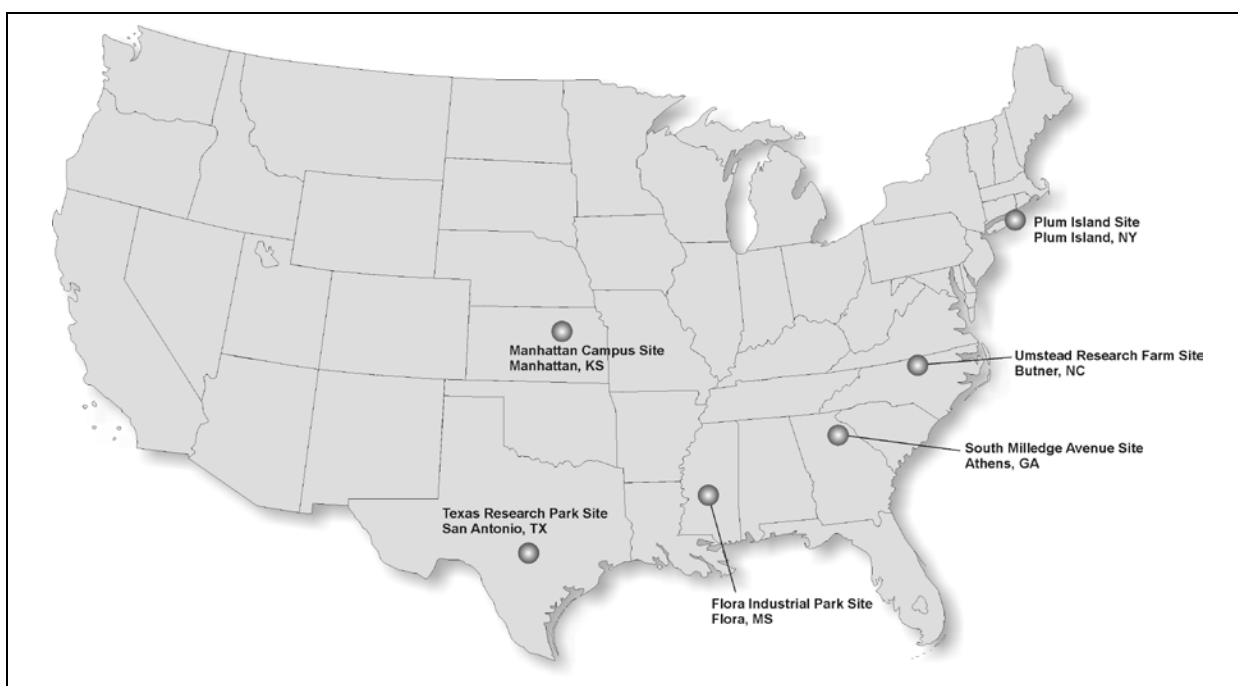


Figure ES-1 — Six Site Alternatives

**South Milledge Avenue Site** is located west of the South Milledge Avenue/Whitehall Road intersection in Clarke County, Georgia. The site is an approximate 67-acre tract of land consisting of open pastureland and wooded land and is owned by the University of Georgia.

**Manhattan Campus Site** is on the campus of Kansas State University immediately adjacent to the Biosecurity Research Institute. The site consists of approximately 48.4 acres southeast of the intersection of Kimball Avenue and Denison Avenue.

**Flora Industrial Park Site** is located in Madison County, Mississippi, and is owned by the Madison County Economic Development Authority. The site is 150 acres on the east side of U.S. Highway 49, north and east of the intersection with North 1st Street.

**Plum Island Site** is a U.S. government-owned 840-acre island located about 12 miles southwest of New London, Connecticut, and 1.5 miles from the northeast tip of Long Island, New York. The Plum Island Site is approximately 24 acres directly east of the existing PIADC, which is on the western shore of the island.

**Umstead Research Farm Site** is located north of the terminus of Dillon Drive along the northern property boundary of the C.A. Dillon Youth Development Center in Butner, North Carolina. The site is an approximate 249-acre tract of undeveloped, cleared, and wooded land.

**Texas Research Park Site** is located in San Antonio, Texas, and extends over the Bexar County line into a portion of Medina County. The 100.1-acre site is located west of Lambda Drive, south of the proposed extension of Omicron Drive, and is currently vacant, undeveloped ranch land.

### **Alternatives Considered But Eliminated From Detailed Study**

Early in the NEPA process, DHS considered other potential alternatives, including suggestions by the public during the scoping process. The following alternatives were considered but determined not to be reasonable alternatives for evaluation in the NBAF EIS:

- **Upgrade PIADC.** The proposed NBAF would require BSL-4 capability. PIADC does not have BSL-4 laboratory space, and the existing infrastructure is inadequate to support a BSL-4 laboratory. Refurbishing the existing facilities and obsolete infrastructure to allow PIADC to meet the new mission would be more costly than building the NBAF on Plum Island. In addition, for the existing facility to be refurbished, current research activities might have to be suspended for extensive periods.
- **Use Existing Laboratory Facilities.** No existing U.S. facility could meet the mission needs determined by DHS and USDA. Although a number of BSL-3 and BSL-4 facilities are located in the U.S., they do not have the capacity to conduct the research required. Similar facilities in Winnipeg, Canada, and Geelong, Australia, do not have the capacity to address the outbreak scenarios in the United States in a timely manner and cannot guarantee their availability to meet U.S. research requirements.
- **Other Locations.** Other potential locations were considered during the NBAF site selection process but were eliminated based on evaluation by the DHS evaluation committee. It was suggested during the scoping process that the NBAF be constructed in a remote location such as an island distant from populated areas or in a location that would be inhospitable (e.g., desert or arctic habitat) to escaped animal hosts or vectors. However, the evaluation criteria called for proximity to research programs that could be linked to the NBAF mission and proximity to a technical workforce. In addition, the Plum Island Site represents an isolated location while meeting the evaluation requirements. It was also suggested that the NBAF could be constructed beneath a mountain; however, the cost and feasibility of such a construction project would be prohibitive.

### **The Preferred Alternative**

The Council on Environmental Quality (CEQ) regulations require an agency to identify its Preferred Alternative in the final environmental impact statement (40 CFR 1502.14). The Preferred Alternative is the alternative that the agency believes would fulfill its statutory mission, giving consideration to environmental, economic, technical, security and other factors. The Preferred Alternative is the Manhattan Campus Site in Kansas.

During the first round site down-select in 2006, DHS conducted an initial evaluation of the 29 responses to the Expressions of Interest (EOI), using the four evaluation criteria set forth in the public notice soliciting EOIs. The four evaluation criteria were:

- Proximity to Research Capabilities
- Proximity to Workforce
- Acquisition/Construction/Operations Requirements
- Community Acceptance

An interagency working group developed the evaluation criteria to ensure that the NBAF would meet the interdependent needs of DHS and USDA to adequately protect the nation against biological threats to animal agriculture. Based on this initial evaluation, 18 sites were identified for analysis in the second round of the selection process in August 2006.

DHS set forth the review process for analyzing the remaining 18 sites against the evaluation criteria, associated sub-criteria, and preferences. The preferences were elaborations of the DHS view of the importance of the four evaluation criteria and sub-criteria. Following this review, six sites were selected as the action alternatives for analysis in the EIS, including Plum Island, New York (see Section 2.3.1). The *July 2007 Competitive Site Selection Memorandum* and the *Plum Island Memorandum for the Record* documented the findings of this process and established the evaluation criteria baseline.

DHS developed and implemented a decision process to identify a Preferred Alternative in the Final EIS. A steering committee, comprised of Federal employees from DHS and USDA, led the evaluation process and made recommendations to the DHS Decision Authority. The process involved a qualitative analysis of the strengths and weaknesses of each action alternative and then an overall data comparison to develop a relative ranking of each action alternative. The steering committee considered the No Action Alternative and weighed it against the proposed action of constructing and operating the NBAF at the highest ranked site alternative to identify the Preferred Alternative.

The steering committee updated the original findings from the second round down-select of each action alternative using new and emerging data collected since July 2007. This data was contained in the following support documents:

- Threat and Risk Assessment (designated as For Official Use Only)
- Site Cost Analysis\*
- Site Characterization Study\*
- Plum Island Facility Closure and Transition Cost Study\*

\* These support documents were posted on DHS's NBAF Web site (<http://www.dhs.gov/nbaf>) in August 2008.

Additionally, DHS requested that each consortium submit an offer, by March 31, 2008, for offsets to the site infrastructure costs. The decision to offer land, funds, or other assets was solely at the discretion of the consortium. The amount of the contribution and how the contribution was funded (bonds, taxes, etc) was determined by the consortium and/or the state and local government officials and was not a decision of the Federal government.

The steering committee then considered the environmental impacts presented in the EIS, including the public comments made at the public meetings and during the 60-day public comment period, along with the Threat and Risk Assessment. Finally, overall site ratings were completed to identify the recommended action alternative.

Based on the numerous strengths that were evident when evaluating against the evaluation criteria, the steering committee found that the Manhattan Campus Site best met the purpose and need to site, construct and

operate the NBAF. These strengths include its location near Kansas State University (KSU), which provides site proximity to existing research capabilities that can be linked to NBAF mission requirements. Additionally, the Site provides proximity to a workforce relevant to the NBAF mission, as it is adjacent to the KSU College of Veterinary Medicine, KSU College of Agriculture, and the Biosecurity Research Institute. The EIS demonstrated that for the Manhattan Campus Site, almost all environmental impacts fell in the “no impacts to minor impacts” category. The steering committee concurred with the EIS that the risk of release of a pathogen was independent of where the NBAF was located. The findings for the Manhattan Campus Site in the Threat and Risk Assessment were found to be comparable to the other Site Alternatives. The Manhattan Campus Site also demonstrated a very strong community acceptance from local, state, and Federal officials and stakeholders. Finally, taking into consideration the “in-kind” contributions offered by the consortia, the Manhattan Campus Site was among the least expensive to construct and had among the lowest planned operation costs of all the Site Alternatives. Following a comparison of this site to the no action alternative, the steering committee unanimously agreed that the Manhattan Campus Site is the preferred alternative.

The environmentally preferable alternative is the alternative that causes the least impact to the environment; it is also the alternative that best protects, preserves, and enhances historic, cultural and natural resources, but is not necessarily the same as the agency’s Preferred Alternative. DHS identified the No Action Alternative as the environmentally preferable alternative due to it having the smallest environmental impact. Under this No Action Alternative, continued operations of the PIADC would have little or no incremental environmental impacts, except for minor and temporary effects from construction of ongoing infrastructure upgrades. Nevertheless, the No Action Alternative does not satisfy DHS’s purpose and need for action and associated mission drivers.

The Record of Decision will address the following:

- The criteria involved in deciding whether to build the NBAF, and if so, where;
- Considerations of national policy, costs, site characterizations, security, and other programmatic requirements;
- Comparison of site alternatives based on the evaluation criteria, environmental impact study and threat and risk assessment; and
- Whether all practicable means to avoid or minimize environmental impacts from the alternative selected have been adopted and, if not, why, as well as any required mitigation, monitoring, and enforcement programs that would be necessary to offset environmental impacts.

## 5.0 ENVIRONMENTAL EFFECTS

One of the factors DHS considered during the site selection process was whether the NBAF could be constructed and operated without causing harm to the environment. This consideration is reflected in the results of the evaluation conducted in the NBAF EIS. Overall, the adverse effects for the site alternatives are minimal, as described:

- **Land Use.** For all site alternatives, land use would be consistent with local land use and zoning regulations except for the South Milledge Avenue Site, which is designated as rural land in the local comprehensive plan. Conversion of approximately 30 acres of open land to the NBAF would occur. No other land use effects are expected.
- **Visual Effects.** For all site alternatives, visual effects would occur during construction activities but would be temporary. Long-term visual effects due to operation of the NBAF would occur, including those from nighttime lighting, particularly at the South Milledge Avenue Site and the Manhattan Campus Site where the NBAF would be visible to nearby residential or recreational receptors. The NBAF would be similar in size to a 400-bed hospital or 1,600-student high school and would be a noticeable landscape feature. Landscaping and appropriate architectural design features would reduce the visual effects.
- **Infrastructure.**
  - Potable water—Potable water use would vary to some degree for each site, but operation would result in use of approximately 36 million (Plum Island Site) to 52 million (Texas Research Park Site) gallons per year. All sites have available capacity to meet this demand. The South Milledge Avenue and Umstead Research Farm sites would need new water lines, and the Plum Island Site would need new groundwater wells and two (2) new water towers.
  - Electricity—Operations at all sites would require 12.8 megawatts of electric power. Capacity is available at all sites to meet this need. Connection to existing or new substations would be needed at all sites.
  - Fuel oil and gas—Operation at all sites except the Plum Island Site would use natural gas as the primary fuel for operating the NBAF. The amount of natural gas needed would vary somewhat for each site, but capacity is available for all sites. New connecting lines would be needed at the South Milledge Avenue Site, the Flora Industrial Park Site, and the Umstead Research Farm Site. Fuel oil would be used in lieu of natural gas at Plum Island Site.
  - Sanitary sewer—Operation at all sites would generate between 25 million and 30 million gallons of wastewater per year. Capacity would be available from existing or planned wastewater treatment facilities. Wastewater discharged by the NBAF would meet all local wastewater permit requirements. New sewer lines would be needed at the Flora Industrial Park Site, the Umstead Research Farm Site, and the Texas Research Park Site.
  - Steam and chilled water—Steam and chilled water would be provided by onsite boilers and chillers for all sites.
- **Air Quality.** Air quality effects would occur with construction and operation of the NBAF for all sites. Air emissions from construction activities would include construction traffic and equipment. Operation of the NBAF would result in air emissions from boilers, emergency generators, and traffic from employees and deliveries. Additional effects to air quality would occur if incineration is used to treat and dispose of pathological waste. Preliminary assessments indicate that operation of the NBAF could affect regional air quality, although additional modeling may be needed once the NBAF design and location have been determined.
- **Noise.** Noise effects would be similar for all sites, although residential or recreational receptors near the South Milledge Avenue Site and the Manhattan Campus Site may be more likely to be affected. Temporary increases in noise levels would occur due to construction activities and construction-

related traffic. Operation of the NBAF would result in minor increases in noise levels from employee traffic and heating and cooling facilities. However, operation of the emergency generators would result in sporadic noise increases during testing.

- **Geology and Soils.** Effects to geology and soils would be similar for all sites. The NBAF would be designed to withstand and minimize the effects of earthquakes. Temporary effects to soils would occur due to excavation and site clearing, but erosion control measures would minimize any adverse effects from construction and operation. Prime and unique farmlands would potentially be affected, at all sites.
- **Water.** Potential effects to water resources could occur with construction activities and would be similar for all sites. However, the South Milledge Avenue Site, the Flora Industrial Park Site, and the Umstead Research Farm Site are closer to surface waters so the potential for effects are greater at these sites. Runoff from the construction site has the potential to enter surface or groundwater sources, but stormwater management during construction would minimize the potential for this to occur. Similar effects could occur with operation of the NBAF. Strict compliance with stormwater pollution prevention plans and spill management protocols would minimize the potential and mitigate the potential effects of a spill. Operation of the NBAF would result in use of between 36 million (Plum Island Site) and 52 million (Texas Research Park Site) gallons per year of water from surface water or groundwater sources. Operation at all sites would generate between 25 million and 30 million gallons of treated wastewater per year that would be discharged from the site. All discharged wastewater would meet local discharge requirements. No effects to floodplains would occur.
- **Biological Resources.** Effects to vegetation, wetlands, wildlife, aquatic life, and threatened or endangered species would be similar for all sites with a few exceptions. Site clearing would remove approximately 30 acres of vegetation, although all of the sites have been previously disturbed to some degree. Wetlands would be affected at the South Milledge Avenue Site from road and utility crossings (less than 0.5 acres), and approximately 0.2 acres of forested uplands would be lost. Threatened or endangered species, aquatic resources, and wildlife would not be directly affected by construction or normal operations at any site. Noise and light from the NBAF could affect wildlife, particularly migratory birds. An accidental release of pathogens from the NBAF would adversely affect susceptible wildlife populations and would be similar for all sites. The research conducted at the NBAF has the potential to prevent or contain outbreaks of the foreign animal diseases that could affect wildlife populations throughout the United States.
- **Cultural Resources.** No effects to cultural resources are likely to occur with construction or operation of the NBAF at any site. Consultation with state and federally-recognized Native American Indian tribes has been initiated. No responses received to date indicate that any of the site alternatives would affect any tribal lands or interests.
- **Socioeconomics.** Construction activities at all sites would result in between 1,300 and 1,614 temporary jobs generating between \$138.2 million and \$183.9 million in labor income and between \$12.5 million and \$24.7 million in state and local taxes. Population, housing, and quality of life would not be affected by construction. Operation of the NBAF would result in 250 to 350 direct jobs and an estimated income of between \$26.8 million and \$30.4 million annually. Population growth due to the NBAF would be a small portion of the estimated growth in the regions surrounding all sites. The effect of the NBAF on the housing market and quality of life (i.e., schools, law enforcement, fire protection, medical facilities, recreation, and health and safety) would be negligible. Law enforcement and fire protection personnel could be trained by DHS to respond to incidents at the NBAF. The risk of an accidental release of a pathogen is extremely low, but the economic effect could be substantial for all sites. A site-specific emergency response plan would be developed to address any local incident including those that could occur at the NBAF. The plan would be coordinated with the local emergency response agencies and include training for first responders. Response measures to minimize risks and quickly contain any accidental release would also greatly reduce the potential economic loss. The climate conditions during winter months would not be

hospitable for mosquito species (the vector for Rift Valley fever virus [RVFV]) to breed at the Manhattan Campus Site and the Plum Island Site. The warmer conditions at the other four sites increase the risk of RVFV becoming established. In any case, the risk of release remains very small.

No long-term, disproportionately high and adverse human health, or environmental effects would occur to low income or minority populations at any of the sites, although there is a potential for disproportionately adverse effects from increased traffic, surface water, or visual on the high minority populations that reside near the various sites. Visual effects and traffic increases due to construction would be minimized with proper site management protocols. Potential traffic effects would be minimized by limiting road closures and rerouting traffic. Economic benefits would potentially occur to populations within the area due to construction-related jobs.

- **Traffic and Transportation.** Local traffic at all sites would be temporarily affected by general construction traffic. Operation of the NBAF would result in only minor increases in daily traffic on roads near the sites except for roads near the Umstead Research Farm Site (Range Road and Old Route 75), which are not heavily used by local traffic and would experience an increase of average daily traffic volumes of approximately 140%. South Milledge Avenue currently experiences poor traffic flow and would be affected by the additional traffic due construction and operation of the NBAF. Modifications recommended by the Georgia Department of Transportation would help minimize the effects. Planned improvements to Potranco Road would improve traffic flow in the vicinity of the Texas Research Park Site. Minor road improvements would also be needed for roads near the Manhattan Campus Site and the Flora Industrial Park Site. Transportation of research materials would not significantly increase the risk of a traffic-related incident.
- **Existing Hazardous, Toxic, and Radiological Waste.** Recent investigations at the Umstead Research Farm Site indicate that the potential for unexploded materials from past military training is low. The Plum Island Site was previously used to dispose of military materials but has been remediated (cleaned up) and should not be a safety concern for workers. Training for construction workers for either of these sites may be required prior to initiation of construction activities to ensure worker safety. None of the other sites would require remediation or additional considerations for the protection of workers, the public, or the environment.
- **Waste Management.** Waste generation and management would be similar for all sites, although the amount of wastewater would vary somewhat for each site. Construction would generate construction debris, sanitary solid waste, and wastewater. Operation of the NBAF would result in generation of wastewater, waste solids, and medical, hazardous, and industrial solid wastes. Operation of the NBAF would generate between 25 million and 30 million gallons of wastewater per year. Wastewater discharged by the NBAF would meet all local wastewater permit requirements.
- **Health and Safety.** The effects of the NBAF on health and safety due to construction and normal operations would be similar for all sites. Standard safety protocols would minimize the likelihood of accidents and personal injury at the NBAF, and normal operations pose no threat to the surrounding communities. An evaluation was conducted to determine the potential for an accidental or intentional (criminal or terrorist) release of a pathogen from the NBAF and the potential for the pathogen to spread from each site alternative. Site-specific protocols would be developed, in coordination with local emergency response agencies that would consider the diversity and density of human, livestock, and wildlife populations residing within the local area. DHS would have site-specific standard operating procedures and response plans in place prior to the initiation of research activities at the proposed the NBAF. The evaluation considered the accident scenarios with and without measures to prevent and contain a release. The results indicate that for all sites the risk was none to low for all accident scenarios except an over-pressure fire, where an explosion would occur due to the buildup of a large amount of gas or flammable chemical in an enclosed area. The risk for an over-pressure fire accident was moderate for all sites. For all sites except the Plum Island Site, the overall risk rank was moderate due to the potential easy spread of a disease through livestock or wildlife. The risk rank for the Plum Island Site was low or none due to the low likelihood of any disease getting off of the island.

**Comparison of the Environmental Effects**

Table ES-2 provides a description of the effect categories used for comparison in Table ES-3. The effects categories are subjective, and the rationale is provided in the previous descriptions.

**Table ES-2 — Environmental Effects Categories**

Effect Category		Definition
Beneficial Effects	Significant	An action that would greatly improve current conditions
	Moderate	An action that would moderately improve current conditions
	Minor	An action that would slightly improve current conditions
Negligible or No Effect		An action that would neither improve nor degrade current conditions
Adverse Effects	Minor	An action that would slightly degrade current conditions
	Moderate	An action that would moderately degrade current conditions
	Significant	An action that would greatly degrade current conditions

No significant adverse effects to environmental or human resources would be expected at any of the site alternatives with normal operation of the NBAF. Moderate effects that would occur would be to the following resources:

- Potable Water—use of 36 million to 52 million gallons of potable water per year at all site alternatives.
- Wastewater treatment capacity—generation of 25 million to 30 million gallons of wastewater per year at all site alternatives.
- Water Resources—use of 36 million to 52 million gallons of potable water per year could affect surface or groundwater resources at all site alternatives.
- Visual Quality—visual prominence of the NBAF at all of the alternative site locations except the Plum Island Site and the Texas Research Park Site
- Land Use—designation of Rural land use for the South Milledge Avenue Site in the Clarke County Comprehensive Plan would not be consistent with proposed use.
- Air Quality—Potential for air emissions to affect local air quality at all site alternatives.
- Traffic—Potential adverse traffic flow effects at the South Milledge Avenue Site and the Texas Research Park Site.

Significant beneficial effects to biological resources (wildlife), economics, and health and safety could occur with the development of new vaccines, diagnostic procedures, or rapid responses to potential FAD outbreaks.



Table ES-3 — Comparison of Environmental Effects

Resource	No Action	South Milledge Avenue Site	Manhattan Campus Site	Flora Industrial Park Site	Plum Island Site	Umstead Research Farm Site	Texas Research Park Site
Land Use	None	Moderate	Minor	Minor	Minor	Minor	Minor
Visual	None	Moderate	Moderate	Moderate	Minor	Moderate	Minor
Infrastructure	Minor	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Air Quality	Minor	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Noise	Minor	Minor	Minor	Minor	Minor	Minor	Minor
Geology and Soils	Minor	Minor	Minor	Minor	Minor	Minor	Minor
Water	Minor	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Biology	Negligible	Minor	Negligible	Negligible	Negligible	Minor	Negligible
Cultural	None	None	None	None	None	None	None
Socioeconomics	None	Minor	Minor	Minor	Minor	Minor	Minor
Traffic and Transportation	None	Moderate	Minor	Minor	Negligible	Minor	Moderate
Hazardous Waste	None	Negligible	Negligible	Negligible	Minor	Minor	Negligible
Waste Management	Minor	Minor	Minor	Minor	Minor	Minor	Minor
Health and Safety	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
Cumulative Effects	None	Minor	Minor	Moderate	Negligible	Minor	Moderate
Potential Beneficial Effects for Normal Operations							
Biology	None	Significant	Significant	Significant	Significant	Significant	Significant
Socioeconomics	None	Significant	Significant	Significant	Significant	Significant	Significant
Health and Safety	None	Significant	Significant	Significant	Significant	Significant	Significant

## 6.0 RISKS AND MITIGATION MEASURES

Measures to mitigate potential environmental, socioeconomic, and health adverse effects are presented in the NBAF EIS. All practicable means to avoid or minimize potential adverse effect from the selected alternative would be incorporated into the design of the NBAF. Potential health and safety impacts during the construction and operation phases of the proposed NBAF are addressed in a hazard assessment that was conducted specific to the NBAF. The hazard assessment included an analysis of the potential risks to the public, livestock, and wildlife from biological material shipments; laboratory accidents; escape of an infected animal; mechanical failures; human errors; contact with contaminated or transiently colonized or infected workers, and natural phenomena events such as hurricanes or tornados; and terrorist acts.

The risks of release of any identified pathogen proposed for study within the NBAF were evaluated specifically and were shown to present a hazard to workers and a potential for release from the facility. These risks were shown to be mitigated by implementation of operation protocols and rigid adherence to the guidelines presented in the Centers for Disease Control and Prevention and National Institutes of Health's Biosafety in Microbiological and Biomedical Laboratories and other standards for safe operational practices, and implementation of security measures as described in the NBAF EIS. The risks associated with the operation of the NBAF as determined from the detailed hazard and accident analysis were shown to present a serious potential for adverse consequences in the event of a release of any of the three representative viruses (foot and mouth disease virus, Rift Valley fever virus, and Nipah virus).

The risk and consequence of a release of foot and mouth disease virus was of concern due to its highly infectious nature and potential economic impact. The hazard analysis included in the Health and Safety section of the EIS, and supplemented in Appendix E, concluded that the likelihood of a release of foot and mouth disease virus was extremely low, given appropriate attention to the design, construction and operation of an NBAF with the array of safety controls described including a robust facility that is capable of withstanding the various analyzed accident conditions. The risk of accidental release was independent of where the facility was located. The analysis of the consequences of a release of foot and mouth disease virus, however, indicated that should a large release occur there is considerable opportunity for the virus to cause infections and become established in the environment beyond the facility boundary. The site-specific consequences were shown to be essentially the same between the sites located on the mainland and was slightly lower for the Plum Island facility due in part to there being less opportunity for the viruses to become established and spread.

While specific economic impact assessments tailored to each potential hazard were completed as part of the EIS process, several independent studies evaluated the economic consequences of a release of foot and mouth disease and are reviewed in Appendix D. The risk of an accidental release of a pathogen is extremely low, but DHS acknowledges that the possible effects would be significant for all sites. The primary economic effect of an accidental release would be the banning of U.S. livestock products regardless of the location of the accidental release. The economic effect which could reach as high as \$4.2 billion until the United States was declared foreign animal disease-free and foreign trade could resume.

## 7.0 NBAF EIS ORGANIZATION AND CONTENT

The NBAF EIS includes the Executive Summary and Chapters 1 through 8 as described below.

**Chapter 1: Purpose and Need**—provides information regarding the purpose of and need for the Proposed Action, outlines the NBAF mission, and provides background on animal disease research and DHS's responsibilities. It also describes the NEPA process, alternatives, decisions to be made, and summarizes the results of the public scoping process.

**Chapter 2: Alternatives**—describes the Proposed Action to site, build, and operate the NBAF; the No Action Alternative; and alternatives considered but eliminated from detailed analysis. It also presents the conceptual

design of the NBAF, a comparison of effects from implementation of the Proposed Action at each site alternative, and the No Action Alternative. It also provides a description of the process used to identify the Preferred Alternative.

**Chapter 3: Affected Environment and Consequences** describes the potentially affected environment under the No Action Alternative and each of the six site alternatives and the approach taken in defining those environments. The potential environmental impacts form the scientific basis for comparison of the site alternatives. The discussion includes the identification of cumulative impacts, unavoidable adverse impacts, irreversible or ir retrievable resource commitments, and the relationship between short-term use and long-term productivity that could occur if the Proposed Action is implemented.

**Chapter 4: Index**—identifies the key terms used in the EIS and where they are used.

**Chapter 5: References**—provides the list of references that are cited in the EIS.

**Chapter 6: List of Preparers**—provides a list of preparers and document reviewers, their academic qualifications, and areas of responsibility.

**Chapter 7: Distribution List**—identifies those individuals and organizations who will receive the NBAF EIS.

**Chapter 8: Glossary**—defines technical terms.

## Appendices

- Appendix A: *Federal Register* Notices
- Appendix B: Understanding Infectious Microorganisms: A Review of Biocontainment Laboratory Safety
- Appendix C: Socioeconomics Tables
- Appendix D: Potential Economic Consequences of Pathogen Releases from the Proposed NBAF
- Appendix E: Accidents Methodology
- Appendix F: NEPA Disclosure Statement
- Appendix G: Agency Coordination
- Appendix H: Comment Response Document

In compliance with Section 508 of the Rehabilitation Act, a 508 compliant version of the NBAF Final EIS is available on the DHS website at <http://www.dhs.gov/nbaf>.

## 8.0 PUBLIC PARTICIPATION

DHS initiated a 60-day public scoping period for the NBAF EIS that began with publication of the Notice of Intent on July 31, 2007, and ended on September 28, 2007. DHS also mailed postcards to approximately 2,650 initial stakeholders including relevant federal agencies, state NEPA points of contact, non-governmental organizations, and associations, as well as mailing lists developed by associated federal agencies and interested organizations. In addition, DHS developed a Web page at <http://www.dhs.gov/nbaf> where public meetings were announced and interested stakeholders could submit comments, ask questions, or request to be added to the mailing list.

### What is Scoping?

This scoping process provides opportunities for the public to give their comments directly to the federal agency on the scope of the EIS. This aids the federal agency in determining the alternatives, issues, and potential environmental impacts to be analyzed in the EIS.

DHS conducted eight public scoping meetings in the vicinity of the six site alternatives, along with one regional meeting in Washington, DC. More than 1,350 people attended the meetings. Nearly 300 people

provided oral comments at the public meetings, and more than 880 comment documents were received during the comment period.

The public comments were analyzed and helped identify and understand local concerns and issues. One area of concern shared by many of the potential site community members was the placement of the proposed NBAF in highly populated areas or in areas that housed institutionalized populations. Another concern related to health risks should an accidental or intentional (criminal or terrorist) release occur and its effects on the population, the ability of affected communities to evacuate the area, and environmental effects. Concerns were also raised on the construction and operation of the NBAF in terms of resources required, particularly water.

Details on the scoping process and issues identified are documented in the *NBAF EIS Scoping Report*, which is available online at <http://www.dhs.gov/nbaf> (click on Public Involvement) and in NBAF reading rooms in public libraries at each site alternative (see <http://www.dhs.gov/nbaf> and click on Public Reading Rooms).

On June 27, 2008, DHS published the Draft NBAF EIS, which commenced the 60-day public comment period that ended on August 25, 2008 (73 FR 36540). During this period, 13 public comment meetings were held in the following locations: Washington, DC (one meeting); Butner, NC (two meetings); Manhattan, KS (two meetings); Flora, MS (two meetings); San Antonio, TX (two meetings); Old Saybrook, CT (one meeting); Greenport, NY (one meeting); and Athens, GA (two meetings). All comments received during the public comment period were considered during the preparation of the NBAF Final EIS. Volume II contains a copy of the comment documents DHS received, as well as transcripts of the oral comments made at the public meetings and by telephone.

DHS received over 1,600 comment documents and phone calls during the 60-day comment period on the NBAF Draft EIS, in addition to 17 different campaign letters and petitions, which yielded over 6,800 signatures. DHS also hosted 13 public meetings, which were attended by more than 1,770 individuals, 452 of whom provided oral comments. Analysis of the oral and written comment documents yielded more than 5,000 delineated comments. The majority of the comments on the NBAF Draft EIS related to the following concerns:

- The ability of DHS and the federal government in general to safely operate a biosafety facility such as the NBAF
- The potential for a pathogenic release to occur through accidents, natural phenomena, and terrorist actions
- The May 2008 GAO report, which concluded that DHS had not conducted or commissioned a study to determine whether foot and mouth disease (FMD) research could be conducted safely on the U.S. mainland
- Natural phenomena such as tornadoes, earthquakes, and hurricanes which could cause catastrophic damage to the NBAF and result in the release of a pathogen
- The possibility that an infected mosquito vector could escape, allowing a pathogen such as Rift Valley fever virus to become permanently established in the United States
- The economic effects of a release or a perceived release on the local, state, and national livestock industry
- The effects of a release on local deer populations and effects on the hunting industry
- Transportation of infectious agents and the release of pathogens due to a transportation-related accident
- The potential for the NBAF being a prime terrorist target and DHS's inability to adequately protect the facility and surrounding community from such an attack

- The release of a pathogen due to human error
- Disgruntled employees having the ability to cause an intentional accident or steal pathogens
- Appropriate funding to safely construct and operate the NBAF would not be available
- Use of the NBAF to manufacture bioweapons
- The need for and effects of mosquito control and spraying of insecticides
- The site selection process and the evaluation criteria used to select the Preferred Alternative
- Waste management regarding carcass disposal effects on local sewage treatment infrastructure from alkaline hydrolysis, and the effects to air quality from incineration
- Pollution of ground or surface water resources due to spills and leaks
- Particularly in Georgia and North Carolina, the amount of water that would be used by the NBAF in light of the current regional drought
- In Georgia, the proximity of the South Milledge Avenue Site to the State Botanical Gardens, the Audubon-designated Important Bird Area, and the Oconee River
- In North Carolina, institutionalized populations not adequately considered in the EIS analysis
- In New York, limited routes from the area should an accident requiring evacuation occur
- In Kansas, the number of cattle in the region and the disastrous effects of a release

## **9.0 CHANGES TO THE NBAF EIS**

The NBAF Final EIS has been revised in response to public comments, availability of new data, and to correct errors and omissions. The resulting changes made in the NBAF EIS are indicated by a vertical sidebar in the margin. The most significant changes include:

- The summary tables in the Executive Summary and Chapter 2 have been modified. All site alternatives show a moderate effect to air quality and water resources, and the South Milledge Avenue Site Alternative now shows a moderate effect to land use.
- The Manhattan Campus Site Alternative now shows a radial design scheme.
- The Flora Industrial Park Site Alternative figures have been revised to show the correct project boundary.
- Construction of the NBAF at the South Milledge Avenue Site was not consistent with the Clarke County Comprehensive Plan. Sections 3.2.3 and 3.2.3.3.1 were revised to acknowledge the conflict and include the Comprehensive Plan land use designation.
- Potential mitigation measures to address nighttime lighting effects on wildlife and surrounding residents that could be incorporated into the final design of the NBAF were added to the resource Sections 3.2, 3.8, and 3.15 under Operation Consequences for each of the site alternatives.
- DHS cited a report prepared by the Lawrence Livermore National Laboratory (LLNL) estimating the potential economic loss due to an outbreak of FMD for each of the site alternatives evaluated in the NBAF Draft EIS. The LLNL analysis was an independent study and had no direct relationship to the analysis and scenarios developed as part of the Draft EIS. As such, revisions were made to Section 3.10.09 and Appendix D, which includes a summary of case studies, including the LLNL report, on the economic effects of an accidental release of FMD virus and Rift Valley fever virus. Additionally, language was added acknowledging the limitations of the results based on necessary assumptions.

- New information regarding the economic effects of hunting on the communities that could potentially be affected by construction and operation of the NBAF was incorporated in Section 3.8.9. The information was used to evaluate the economic effects of an accidental release of a pathogen such as the FMD virus on hunting.