# NATIONAL BIO AND AGRO DEFENSE FACILITY (NBAF)

## Site Cost Analysis

Department of Homeland Security

DHS Project No.: LGL07C00004

July 25, 2008

N D P

NBAF Design Partnership

The *Joint Venture* of

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ccrd partners

## Log of Amendments to the NBAF Site Cost Analysis dated July 25, 2008

| Item No. | Description / Revision | Location (Section/Page) |
|---|---|---|
| 1 | The total project estimate amounts have been updated to coordinate with the final estimated costs as indicated under section 2 of the report. | Section 4, page 3, category 9 |
| 2 | The word expandability has been removed from the title of the first category under site fit. | Section 4, page 3, category 1 |

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# Section 1: Introduction

## 1.1. Report Summary

## 1. INTRODUCTION

The Department of Homeland Security (DHS) has the responsibility and national stewardship mandate for detecting, preventing, protecting against, and responding to terrorist attacks within the United States. These DHS responsibilities, as applied to the defense of animal agriculture, are shared with the Department of Agriculture (USDA). The interdependence of the DHS and USDA missions requires development of a coordinated strategy to adequately protect the Nation against biological threats to animal agriculture. Consultations between DHS and USDA on a coordinated biodefense strategy as called for in Homeland Security Presidential Directive 9 (HSPD-9), "Defense of United States Agriculture and Food," have revealed an infrastructure gap that must be filled by an integrated research, development, test, and evaluation (RDT&E) infrastructure for combating bio- and agro-terrorism threats. The Directorate of Science and Technology (S&T) is responsible for filling the gap in the Nation's biocontainment infrastructure as defined by the related homeland security efforts of DHS and USDA. The proposed NBAF would enable DHS to fulfill its mission of detecting, preventing, protecting against, and responding to bioterrorist attacks within the United States.

The Plum Island Animal Disease Center (PIADC) has historically conducted much of the research that would be conducted at the NBAF. The Homeland Security Act of 2002 recognized that protection of U.S. agriculture is a critical element of Homeland Security and transferred ownership of PIADC from USDA to DHS in 2003. Recognizing the growing need for veterinary countermeasures to protect this Nation's agricultural sector and recognizing the limitations posed by the current PIADC facility to meet this requirement, HSPD-9, directs that the "Secretaries of Agriculture and Homeland Security would develop a plan to provide safe, secure, and state-of-the-art agriculture biocontainment laboratories that research and develop diagnostic capabilities for foreign animal and zoonotic diseases." Furthermore, HSPD-9 requires that DHS, USDA, and others would "accelerate and expand development of current and new countermeasures against the intentional introduction or natural occurrence of catastrophic animal, plant, and zoonotic diseases." The Secretary of Homeland Security is responsible for coordinating these activities.

Based on bio- and agro-defense mission requirements as well as facility limitations at Plum Island, such as its limited Biosafety Level 3 (BSL-3) space and lack of any Biosafety Level 4 (BSL-4) space, the need was identified to enhance the U.S. Government's current research capabilities in the animal agricultural field to meet the requirements of HSPD-9. DHS therefore began exploring potential sites, in addition to its Plum Island site, for a proposed new national research and development (R&D) BSL-3 and BSL-4 asset, the proposed NBAF. The publication in the Federal Register on July 31, 2007 of the Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS) began the National Environmental Policy Act (NEPA) process for the proposed NBAF.

**Site Selection & EIS Summary:**

The Site Selection Authority for the NBAF site selection determined that six (6) sites, including Plum Island, would advance as reasonable alternatives in the Notice of Intent (NOI), published in the Federal Register on July 31, 2007 for the NBAF Environmental Impact Statement (EIS) Process. The six (6) sites are listed in alphabetical order by state as follows:

| Alternative Sites | |
|---|---|
| Athens, Georgia | South Milledge Avenue Site |
| Manhattan, Kansas | Manhattan Campus Site |
| Flora, Mississippi | Flora Industrial Park Site |
| Plum Island, New York | Plum Island Site |
| Butner, North Carolina | Umstead Research Farm Site |
| San Antonio, Texas | Texas Research Park Site |

The publishing of the NOI on July 31, 2007 began the National Environmental Policy Act (NEPA) process. The NEPA of 1969 requires the preparation of an Environmental Impact Statement (EIS) for major federal actions that may significantly affect the quality of the environment. Once the final EIS is published, a minimum 30-day waiting period is required by NEPA before a ROD can be issued in the *Federal Register*. The ROD notifies the public of decisions on the proposed action and the reasons for them. The ROD also notifies the public of the decision on the proposed action of whether to build the NBAF and, if so, where to build and operate it. The ROD documents the reasons for the decision and addresses the following items:

1. The decision whether or not to build the NBAF.
2. If the decision is made to build the NBAF, where it would be built.
3. Discussion of the alternative sites considered, specifying the alternative sites which are environmentally preferable.
4. Discussion of factors involved in the decision of if and where NBAF would be built, including any considerations of national policy, site specific costs, site characterizations, security, and other programmatic considerations.
5. Discussion as to whether all practicable means to avoid or minimize environmental harm from the alternative selected have been adopted and, if not, why they weren't; any required mitigation, monitoring and enforcement programs that would be necessary to offset any unavoidable environmental impacts.

The engineering analysis, which contains a site characterization study and a site cost analysis, will provide this additional decision data that DHS may use to help evaluate and select the final site for the NBAF, which will be issued as a Record of Decision, ROD, in the *Federal Register*.

In addition to siting and construction considerations, DHS is further considering a range of alternative operational governance models including GOGO's, GOCO's, and Federally Funded Research and Development Center approaches, as summarized below:

- **GOGO:** provides for full government ownership and control of capital plant and equipment and public financing of operations.
- **FFRDC's:** originated during World War II as a way to meet specialized military research needs that some argued could not be met by existing military labs. Since

then, they have played a significant role in maintaining the defense technology base of the Nation. The contractor owns the laboratory site, buildings, and equipment and also provides the employees and managers.

- **GOCO's:** the DOE national laboratories, such as Sandia National Laboratory, Los Alamos, Lawerence Livermore are defense-related GOCO's. The government owns the laboratory site, the buildings, and the equipment, while the contractor (a commercial company, university, or nonprofit) provides the employees and managers.

It has been determined however that the type of operating models will not have a significant effect on the costs associated with the six sites being evaluated therefore the type of operating model will not be included in the site characterization or site cost analysis reports.

### 1.1. Site Characterization Study and Site Cost Analysis Summary:

Both reports represent the findings, evaluations and estimated costs based on a site specific analysis of each of the six sites using the following criteria:

- Preliminary Subsurface Investigation
- Phase I Site Assessment
- Wetlands Delineation
- Seismic Analysis
- Foundation Analysis Based on Geotechnical Report
- Preliminary Site Concept Diagrams of NBAF Program to Test Fit Sites
- Evaluation of Anticipated Site Work
- Analysis of Utilities
- Analysis of Roadway Infrastructure
- Evaluation of any Special Permitting Requirements
- Evaluation of Labor Market
- Evaluation of Required Security and Set-Backs

Over a four week period members of the NBAF Design Partnership, NDP, accompanied members of the EIS and DHS teams to each site and met with the consortium representatives and walked the sites to begin documenting the items noted above. Each consortium also submitted various documents which were used to help fulfill the needs of completing the analysis of these sites. The site visit to Plum Island added the additional requirement of analyzing three potential sites on the Island. DHS selected a site for further analysis based on engineering feasibility, mission effectiveness and minimal known environmental impacts. The specific goals as set forth by DHS for both studies are as follows:

**Goals:**

Site Characterization Study - The Department of Homeland Security's (DHS) goal with the site characterization study is to provide detailed descriptions and analysis to the NBAF steering committee to facilitate selection of a site with the least physical and geographical encumbrances so that the site may be developed without extremely complicated, costly, invasive, or lengthy mitigation techniques. This Report will indicate any factors relative to site selection and indicate any additional costs unique for each site. These cost factors are those which may require additional site work and/or specialized engineering in order to construct and or operate the NBAF program.

Site Costs Analysis - The goal of the report is to determine the factors and effects of the alternative sites and to quantify these factors and express them in dollar amounts. DHS' goal

is to minimize the construction, infrastructure and operating costs of the NBAF to be consistent with public health and safety, security, and environmental protection. When applicable, the report was written in accordance with procedures described as "Cost Effectiveness Analysis" in OMB Circular A-94. The Site Cost Analysis will present the final evaluation of each alternative, including all estimated costs. The goal is to minimize the cost while meeting the mission of the NBAF.

This report will not present any recommendations but rather provide findings with anticipated implications.

**Organization of Site Cost Analysis:**

This report is organized to present the findings and costs that have been estimated and quantified based on the criteria as noted above. The first section, "Introduction", provides the general basis of understanding for the purpose, need and process used to develop this report. The second section, "Site Specific Cost Estimates", provides the actual estimated construction costs associated with each site and provides a comparison analysis. The third section, "Operations & Maintenance Costs", evaluates the anticipated utility costs, salaries and maintenance of NBAF. The fourth section, "Cost Benefit Analysis", provides a matrix of benefits and challenges for all six sites and also includes the proposed site concept diagrams. And the fifth section, "Summary", provides the closing remarks based on the findings of this analysis and a summary total of estimated site specific costs.

## 1.2. BASIS of DESIGN

**Program Basis of Design:**

The National Bio and Agro Defense Facility (NBAF) is envisioned to provide the nation with the first integrated agricultural and zoonotic disease, research, diagnostics, training and evaluation (RDT&E) facility with the capability to address threats from high-consequence zoonotic disease agents and foreign animal disease (FAD) agents. The facility would also provide the additional infrastructure required for threat and vulnerability assessments and for testing and evaluating promising FAD and zoonotic disease countermeasures. NBAF would support the complementary missions of the Department of Homeland Security (DHS) and the United States Department of Agriculture (USDA).

The NBAF project provides an opportunity for a new state-of-the art facility to replace the current Plum Island Animal Disease Center (PIADC) which currently supports:

- DHS Science & Technology (S&T) FAD Targeted Advanced Development (TAD) countermeasure program
- USDA, Animal and Plant Health Inspection Service (APHIS) Foreign Animal Disease Diagnostic Laboratory (FADDL) program
- USDA, Agricultural Research Service (ARS) Foreign Animal Diseases Research Unit (FADRU) program.

The conceptual design and feasibility study, completed in August 2007, reviewed two major areas:

- Existing Mission – The PIADC facility is now greater than 50 years old and due to obsolete design, systems, a deteriorating infrastructure, and expanded DHS and USDA programs it is becoming increasingly more difficult and expensive to maintain in support of the scientific research, development, and diagnostic programs. This feasibility study will explore keeping the scope of the NBAF the same as the current

PIADC mission while building the facilities required to meet the needs of the first half of the 21st century.

- Expanded Mission – Expand the scope to include additional agricultural biocontainment laboratories at BSL- 3 agriculture (BSL-3Ag), BSL-3E and BSL-4 for foreign animal and zoonotic diseases as called for in Homeland Security Presidential Directive (HSPD)-9.

**Program Components:**

The NBAF project scope consists of two laboratory facilities and four outbuildings within the site itself. One of the two laboratory buildings would be the primary research building containing the BSL-2, BSL-3E, BSL-3Ag, & BSL-4 laboratories with their associated support spaces as identified in the space summary list located in section 4 of this report. The other laboratory building would be a cGMP laboratory located adjacent to the primary research laboratory. In addition to the two laboratory facilities, there would also be other outbuildings which support the overall operation of NBAF:

- Entry Guard House – Controls site access
- Central Receiving Facility – Controls all deliveries to the site for transfer to the laboratory facilities and provides central storage for the feed and bedding
- Grounds Equipment Storage – Stores all grounds equipment and miscellaneous repair equipment
- Parking – General surface parking for staff and visitors
- Central Utility Plant (CUP) - Located within NBAF's primary security zone.

**Architectural Basis of Design:**

NBAF is a national asset which would become the international 'icon' for biocontainment around the world. All design decisions will be measured against the goals and vision as set forth in the Conceptual Design and Feasibility Study (dated August 2007, NDP). The one overarching design goal would be to provide a facility which supports and enables the science while providing a safe, secure and enjoyable work environment.

One of the primary design goals is to provide an adequate level of redundant safety and containment which would be integrated into every component of the building. All lab areas, animal areas, support areas and engineering systems would have 100% back-up and redundancy. Each site would be evaluated against the following design goals:

[redacted]

This level of

safety, redundancy and security helps to provide instant and automatic safeguards to the staff and community it serves to support the overarching design goal of providing a safe and enjoyable work environment. Each site will be evaluated to insure that these safeguards can be met.

# Section 2: Site Specific Cost Estimates

## 2.1. Project Cost Summary

The following is a description with assumptions of how the NBAF project budget has been estimated in this report. With a project budget originally approved at **$451,000,000**, this report analyzed and evaluated all related project costs and provides a comparison against the originally approved project budget at each of the six sites being evaluated. The four major categories that comprise the project budget are construction costs, escalation, contingency and fees. The loose scientific equipment costs fall outside the NBAF project budget as these costs would be funded by the agency or program that will use this equipment.

1. Construction Costs - The construction costs include all building related costs, site development costs and fixed equipment costs, both scientific and technology.
2. Escalation – Escalation was estimated using the data as published and recorded by Engineering News Record, ENR, which has indexed 20 cities over the past 20 years. The escalation percentages used were the average taken from 2003 through 2008 for the cities of Atlanta, Dallas, Kansas City and New York. The specific NBAF sites were not listed in this index therefore the closest reasonable cities were selected.

   Table 2.1.1 graphs construction escalation over the past 10 years to indicate the general fluctuations in the market and demonstrates where NBAF falls within this escalation curve. The graph shows that current construction escalation is increasing on a steeper curve than the average escalation of 3.5% - 4% due to current market conditions, shortage of materials worldwide and escalating fuel prices.

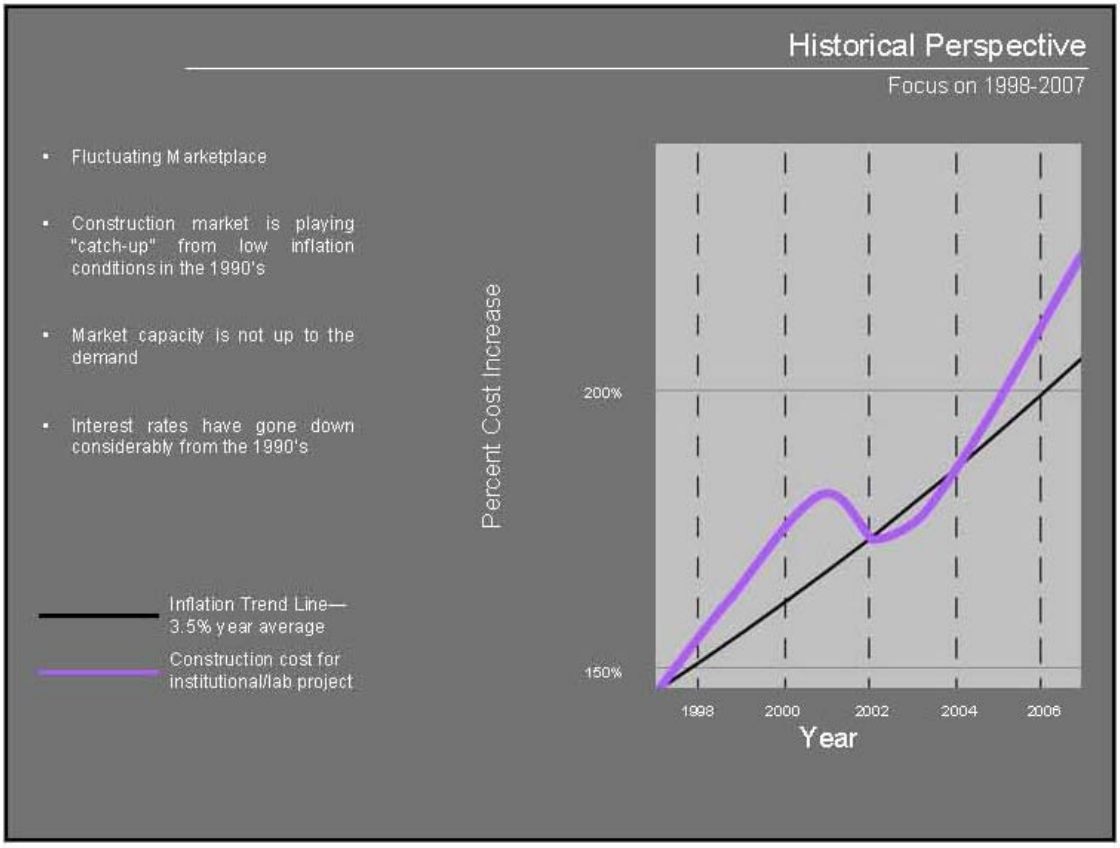


Table 2.1.1 – Market Escalation Trends 1998 - 2007

**3.** Owners Management Contingencies – Project contingencies are required to protect the project budget from various known and unknown risks. Most of these contingencies would ultimately be absorbed into the project budget as the project progresses. Below is a list and description of the contingencies as carried on NBAF.

- Owners EIS Contingency – This contingency is carried to offset any unexpected costs associated with further development of the EIS document itself. These costs would represent the need to provide additional information and or reports that were not originally anticipated but found to be necessary to further support the findings of the EIS. This report carries a 5% EIS contingency applied against the original EIS fee.
- Owners Construction Contingency – This contingency is carried to offset any unexpected costs which occur during construction due to latent conditions, ie. unforeseen site conditions, regulatory changes or interpretations in the field and imperfections in the documentation. This report carries a 10% construction contingency applied against the total estimated construction costs including CM fees and inflation has been applied.
- Owners Design Contingency – This contingency is carried to offset any unexpected costs associated with further development of the design during the life of the project. This contingency would be used to compensate the designers for a change in the scope of services or for refinement in these services. This report carries a 10% Design Contingency applied against the original design phase fee.
- Owners Construction Administration Services Contingency – This contingency is carried to offset any unexpected costs associated with extending or augmenting the Construction Administration services for the project. This may result from extension of contract schedule beyond the original agreement or the necessity to augment the amount of Construction Administration support whether on-site or in the office to support the project. This report carries a 5% Construction Administration Services Contingency applied against the original Construction Administration fee.
- Owners Commissioning Contingency – This contingency is carried to offset any unexpected costs associated with additional commissioning activities found to be required during the actual commissioning of NBAF. This report carries a 5% Commissioning Contingency applied against the original commissioning fee.
- Owners FF&E Contingency - This contingency is carried to offset any unexpected costs associated with a change in scope of the fixtures, furniture and or equipment during the life of the project. This report carries a 5% FF&E Contingency applied against the original FF&E construction costs and moveable scientific equipment costs.

**4.** Fees – Includes all the architectural and engineering design fees through design and construction, commissioning fees, environmental impact statement (EIS) fees, conceptual design report fees, technical/public outreach fees, project management consultant fees and multiple special testing and inspection service fees.

**5.** Loose Scientific Equipment – Includes all equipment not hard piped or wired to the NBAF facility which can be purchased and installed after the facility is constructed. This equipment cost *does not* fall under the NBAF project budget and would be funded by the specific agency and or program using the equipment. The cost is estimated and indicated for reference purposes only in this report however this cost is included as part of the Plum Island Animal Disease Center Closure and Transition Report.

Additional contingencies that would be included within the project costs during the design phase are listed below. Unlike the contingencies listed above, each of these contingencies

would be absorbed into the project budget prior to commencement of construction and are used to insure that the project is not impacted at the time construction by possible budget overruns. Table 2.1.2 indicates how these phase specific contingencies would be used, when they would be reduced and at what phase they would be absorbed into the project.

- Design Contingency – Covers further development of the design, unanticipated changes, development and definition of lump-sum allocations and measured elements, development and definition of details and assemblies, and estimating errors and omissions. This contingency is not to be confused with the previous design contingency which is intended for design fee adjustments only. This contingency is intended to be used to bridge the gap in the design documents to insure that information that is not yet clearly indicated in the documents is included as a percentage of the construction cost. This contingency is continually reduced as the project progresses from phase to phase and ultimately goes to 0% once the documents are completed.
- CM Contingency - Covers errors in scope assumptions made by the Construction Manager
- Escalation Contingency - Covers increases due to inflation (labor and materials) until start of construction, increases due to lack of bidders or busy market conditions, variance between actual bid amounts and averages used in estimating.

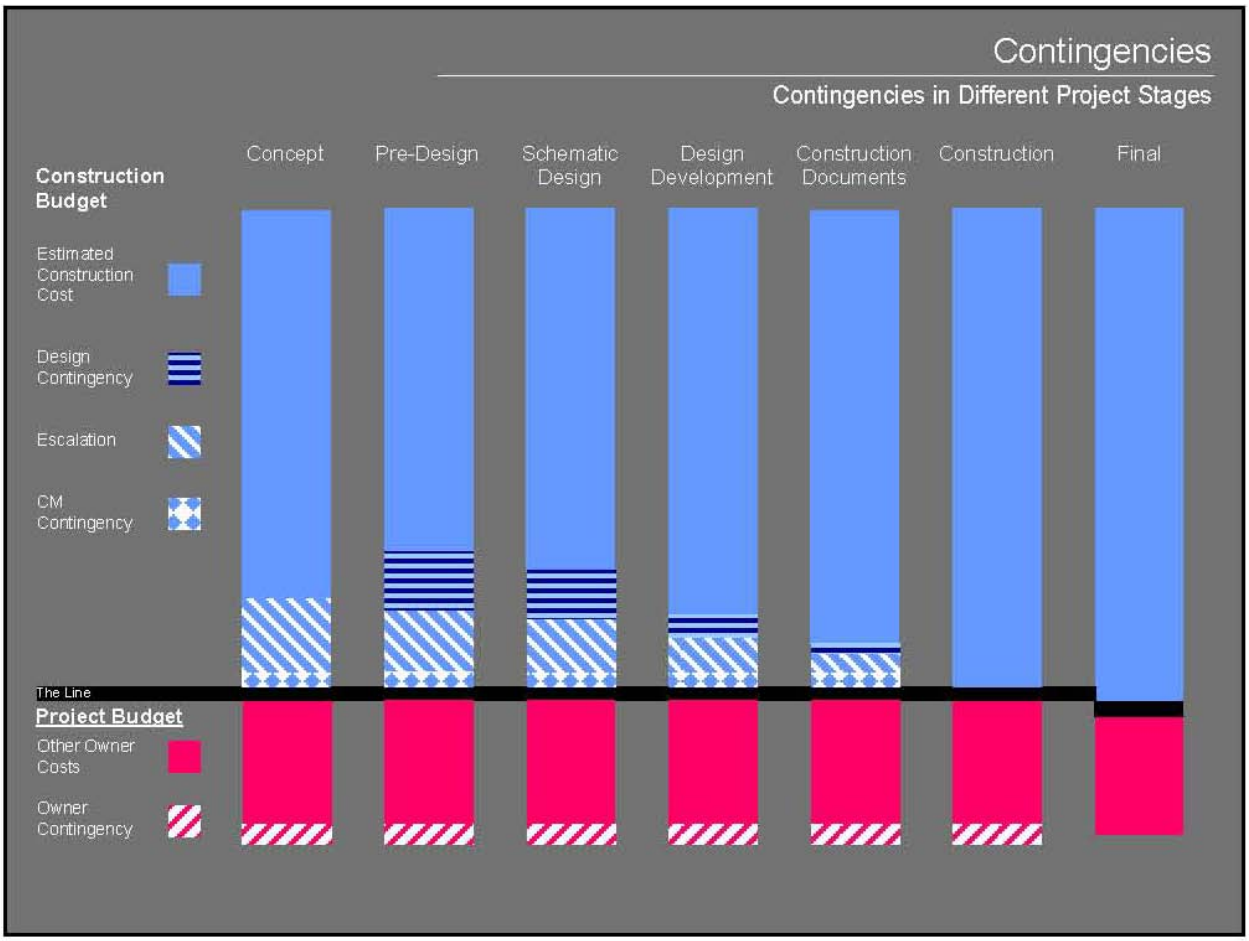


Table 2.1.2 – Contingency Graph over Life of Project

## 2.2. Construction Costs Summary

The construction costs are based on the NBAF program as indicated in the Feasibility Study dated August 24, 2007 and is comprised of the main research building, laboratory & office furniture, signage allowances, site preparation, security equipment, security fencing, IT cabling, gatehouse, ground keeping equipment/feed storage, transfer center, cGMP facility, central utility plant, site utility infrastructure and all associated site drives. These costs were generated and estimated using the NBACC and the Ames, Iowa BSL-3Ag facilities as the two benchmark projects. This analysis includes all cost associated with the construction, operation and maintenance of the NBAF facility at each site for the intended purpose of providing a quantitative comparison of these costs for each site.

All activity base costs were estimated using 2008 rates. All cost estimating was performed in accordance with the Association of the Advancement of Cost Engineers (AACE) Classification System identified in the AACE International Recommended Practice No. 17R-97. In accordance with this practice, the cost estimates provided in this study are intended for a budget or control end usage and were developed with a combination of stochastic and deterministic methods. Therefore, this estimate should be considered a Class 3 estimate with an expected accuracy range of -30%/+60%**.** This class 3+ estimate represents a more conservative method of analyzing the project costs based on the stage the project is in and the availability and general accuracy of the data being evaluated.

The varying cost factors that are found throughout the country can be attributed to the distinct labor markets, various taxing authorities, and specific delivery locations for material supply. From the materials perspective, commodity prices have eased slightly over the past quarter, but global demand, especially from the emerging economies, continues to drive an upward trend in prices. Manufacturing and transportation cost increases, reflecting increased energy costs, have also added to the escalation of construction costs.

Labor – The Davis Bacon Rates have been used in determining the appropriate labor costs associated with each site. In the Northeast labor unions have controlled the labor market for numerous years, starting shortly after the turn of the last century. In the southeast this is partly true as well, but it has never been with as much intensity as the northeast. In the south central US, many of the states are 'Right to Work States'. This means that the unions have only voluntary control of the labor markets. Supply of labor also has a bearing on the various US markets. With current population trends, availability of labor in the south central US is greater than in the northeast or central US.

Taxing Authorities - Taxing authorities vary from state to state as well. In some states there is no state income tax while in others it is imposed by the state. This has an affect on the cost of doing work within the various US regions.

Material Supply - Material production, delivery and supply is also affected by the labor market. This has less impact than the local labor markets but still affects costs.

The table below represents the anticipated cost factors for each of the six sites being evaluated as part of this analysis. The cost factor for Plum Island represents an increase due to the remoteness of accessing the island from both the physical and security aspects. This increase was determined upon evaluation of past and current construction project costs on the island. These cost factors are be applied against the 2008 construction costs prior to adding further escalation through the mid point of construction.

| Site | Cost Factor |
|---|---|
| Athens, Georgia | 0.95 |
| Manhattan, Kansas | 0.97 |
| Flora, Mississippi | 0.90 |
| Butner, North Carolina | 0.95 |
| Plum Island, New York | 1.32 |
| San Antonio, Texas | 0.90 |

The actual cost breakdown tables are provided under section 2.3 of this analysis.

2.2.1. Building Costs Summary

There are five building structures included in the NBAF program. Each site will be evaluated, under section 2.3 of this analysis, to determine which of these components would be required based on the existing conditions. The following is the list of the five structures and approximate size.

- Main Research Building – 504,000 GSF
- cGMP Facility – 13,000 GSF
- Main Security Gatehouse – 1,000 GSF
- Central Receiving (Ground Keeping Equipment/Feed Storage, Transfer Station/ Visitors' Center/ Feed and Bedding Storage) – 22,000 GSF
- Central Utility Plant – 56,000 GSF

2.2.2. Equipment & IT Costs Summary

Furniture & Equipment:

- Laboratory & office furniture includes all required furniture, not casework, and chairs for both laboratories and office environments. It is assumed that the average cost to fit out each office would be $7,500.
- The fixed equipment category 'A' and casework category 'F' as indicated in this analysis is part of the construction budget. Fixed equipment is defined as any piece of equipment that is directly connected to the building itself by means other than utility connections. Casework is defined as furniture that may or may not be physically connected to the facility but is a component that is used and associated with the science which occurs within NBAF. The loose scientific equipment category 'C' is indicated in this report but its cost is not included within the estimated construction cost. This equipment would be funded and provided by the respective government agency or program. Loose equipment is defined as all associated scientific equipment that would be required to operate the NBAF scientific program but is not directly connected to the NBAF facility and has the ability to be moved between laboratories if necessary.

IT – The IT scope provided under the NBAF construction budget has been based on the most recent IT cost encountered on the NBACC facility with a 2.82 multiplier applied for the increased project size as compared to NBACC.

The scope includes all cabling, service entrance facility, risers, all wiring between the closets, outlets with termination of wires at the patch panels and wall device, phones and computers as well as all active electronics including switching equipment, data routers and servers. The costs related to the infrastructure (raceways, cable trays, and data rooms) are carried under the electrical division.

2.2.3. Sitework Costs Summary

Sitework Costs – The costs associated with providing all grading, roadways and on-site storm management is included within the construction costs. Each site has been evaluated to determine if any of the anticipated sitework activities impacts any existing environmental issues.

2.2.4. Utility Infrastructure Costs Summary

Utility Infrastructure Costs - The costs to provide utility services from the closest available utility connection point is included within the project costs. The costs associated with increasing the utility services if necessary have also been added to this report upon evaluation of the responses as received from each site consortia of their final in-kind contribution.

2.2.5. Site Security Systems & Equipment Costs Summary

[redacted]

## 2.3. Site Specific Construction Costs Assumptions

2.3.1. Building Costs Assumptions

a. (A) Athens, Georgia:

- Buildings - The site requires the construction of all five building facilities, as indicated under section 2.2.1 above, to support the NBAF program as the placement of the site is remote from any other Department of Homeland Security structures.
- Foundation Systems – The anticipated foundation system based on the preliminary Geotechnical report would be spread footings. Based on the amount of cut required it is anticipated that there would be some rock removal required however the majority of this rock is anticipated to be partially weathered based on the Geotechnical report and therefore should be removed during construction by earthwork equipment. There may be a percentage of this rock that would require blasting due to the amount of grading required.

b. (B) Manhattan, Kansas:

- Buildings - The site requires the construction of all five building facilities, as indicated under section 2.2.1 above, to support the NBAF program as

the placement of the site is remote from any other Department of Homeland Security structures. The conceptual site diagram for the main research building at the Kansas site has a more compact footprint due to the limited available acreage. The other five sites have identical conceptual designs.

- Foundation Systems – The anticipated foundation system based on the preliminary Geotechnical report would be spread footings. It is anticipated that there would be some rock removal required and expansive soils to contend with however this rock is believed to be partially weathered based on the Geotechnical report and therefore should be removed during construction by earthwork equipment. Based on the depth of the expansive soils, removal should occur during the required earthwork for the site.

c. (C) Flora, Mississippi:

- Buildings - The site requires the construction of all five building facilities, as indicated under section 2.2.1 above, to support the NBAF program as the placement of the site is remote from any other Department of Homeland Security structures.
- Foundation Systems – The anticipated foundation system based on the preliminary Geotechnical report would be spread footings. The preliminary Geotechnical report found minimal rock therefore no rock removal is anticipated.

d. (D) Butner, North Carolina:

- Buildings - The site requires the construction of all five building facilities, as indicated under section 2.2.1 above, to support the NBAF program as the placement of the site is remote from any other Department of Homeland Security structures.
- Foundation Systems – The anticipated foundation system based on the preliminary Geotechnical report would be spread footings. Based on the amount of cut required it is anticipated that there would be some rock removal required however this rock is believed to be partially weathered based on the Geotechnical report therefore should be removed during construction by earthwork equipment.

e. (E) Plum Island, New York:

- Buildings - The site does not require the construction of all five building facilities to support the NBAF program as the island contains the following facilities that are proposed to be reused by the NBAF program.
  - Existing Security Gatehouse
  - Existing Ground Keeping Equipment/Feed Storage
  - Existing Transfer Station/ Visitors' Center/ Feed and Bedding Storage

- Existing Training Module Classroom Support - ~**3,600SF** for auditorium, pre-function, security, storage, and rest rooms.
- Existing Office and Auxiliary Space - 25% of all research program office space (ARS, APHIS and DHS) ~**3,660SF** of 14,640SF programmed.
- Existing Conference Room Requirements - ~**260SF**
- Existing Library Requirements – ~**1,200SF**
- Existing 50% of Kitchen/cafeteria Requirements ~**1,435SF**
- Existing General Building Support Space - 50% of Engineering Shops ~**990SF**
- Existing Mail Room - ~**440SF**

- Foundation Systems – The anticipated foundation system based on the preliminary Geotechnical report would be spread footings. Based on the amount of earthwork required no rock removal is anticipated pet the Geotechnical report findings. The Geotechnical report also indicated the presence of a water table that would require the foundation system have a foundation drainage system.

f. (F) San Antonio, Texas:

- Buildings - The site requires the construction of all five building facilities, as indicated under section 2.2.1 above, to support the NBAF program as the placement of the site is remote from any other Department of Homeland Security structures.
- Foundation Systems – The anticipated foundation system based on the preliminary Geotechnical report would be pile footings. Based on the amount of earthwork required no rock removal is anticipated per the Geotechnical report findings.

2.3.2. Equipment & IT Costs – It is assumed that the equipment and IT scope would be the same at each of the sites. Any existing IT infrastructure at Plum was assumed to not be reused for NBAF as the capacity, age and compatibility of the system could not be evaluated or determined to meet the needs of NBAF.

Table 2.3.2.1 indicates the estimated costs related to research equipment for NBAF. These costs were extrapolated from the NBACC project in Frederick Maryland and the National Center for Animal Health project in Ames Iowa which are similar in program to NBAF.

- Category 'A' is fixed research equipment and is included as part of the project budget.
- Category 'C' is scientific equipment, loose, and is not included in the project budget.
- Category 'F' is casework equipment which is included in the project budget.

**Notes**

1 The following equipment cost summary has been developed for the NBAF facility utilizing the USAMRID replacement project equipment list as a bench mark. The USAMRID equipment costs were developed in 2005. Similar spaces and equipment are present in both projects.

2 The costs below are broken down into 3 Categories; "A" fixed equipment, "C" scientific equipment (both bench and floor), and "F" Casework. Numerically the individual categories can be broken down as follows;

a. Category "A" fixed represents approximately 22% of the total cost of equipment.
b. Category "C" scientific represents approximately 70% of the total cost of equipment
c. Category "F" Casework represents approximately 8% of the cost of the equipment.

3 The costs shown essentially represent everything that one would see in the space once completed and ready for move in. From the chairs to science equip, casework and security devices. Hanging or attached to the walls. There may be some duplication which will need to be sorted at the appropriate time.

| Space type | | Equipment Categories Cat. "A" (fixed) | Cat. "C" (scientific) | Cat. "F" (casework) | Total | Remarks |
|---|---|---|---|---|---|---|
| Office space 180 | | | | | | |
| Type "A" @ $10,000 Ea | 90 | | | | | |
| Type "B" @ $7,500 Ea | 90 | | | | | |
| Lobby / Conference space | | | | | | |
| BSL 2 | | | | | | |
| BSL 3E | | | | | | |
| Reagent Production | | | | | | |
| Cell culture media prep | | | | | | |
| Molecular Bio. Core | | | | | | Incl. MassSpec. Cell sorting, DNA analysis, Genomics, Proteomics |
| Freezer Pharm | | | | | | |
| BSL 4 | | | | | | Incl. change rooms, air hoses, suits, autoclaves, HR penning gating O'head hoists, coolers necropsy tables, casework |
| ABSL 3 AG | | | | | | Incl. all penning, gating, cage wash, autoclaves, necropsy equipment, HR equip and assoc change rooms. Security cams essentially everything in the room |
| CGMP Module | | | | | | |
| Training / conference | | | | | | Incl. seminar room, conf seating, AV equip & cameras & catering kitchen. |
| Central Loading dock incoming and waste But not animal docks | | | | | | Incl. dock eq. haz material stor. Break out areas, storage cages, cylinder storage etc. |
| Safety Labs offices and facilities housekeeping, Engineering | | | | | | Safety offices, Linen and laundry, Maintenance |
| Library and visual info | | | | | | |
| Security gate | | | | | | |
| Receiving building | | | | | | |
| Feed and equipment Warehouse | | | | | | |
| **Total** | | | | | | |

Table 2.3.2.1 – Research Equipment Quantity and Cost Breakdown

2.3.3. Sitework Costs

a. (A) Athens, Georgia:

- Earthwork - It is anticipated that the earthwork can be balanced on-site with **292,678 cubic yards of cut** and 254,840 cubic yards of fill. Fills range from 0-34 feet and cuts from 0-36 feet. Note that this earthwork would likely require rock removal.
- Wetlands – A wetlands/waters of the United States (WoUS) review found that the site contains no wetland areas however some stream channels were observed on the western portion of the property. Careful planning is required to avoid impacting this stream.
- Transportation Infrastructure - Approximately 1,200 feet of driveway would need to be constructed from South Milledge Avenue to the gate onsite. It is expected that South Milledge Avenue can support the facility with its current condition and no major road upgrades are necessary. There may be a need for deceleration and acceleration lanes and a left turn lane at the driveway entrance to facilitate traffic flow. An exit only road (which is intended for emergency evacuations) is proposed along the southeast side of the site and connects to Whitehall Road.

b. (B) Manhattan, Kansas:

- Earthwork - It is anticipated that the earthwork can be balance on-site with **284,770 cubic yards of cut** and 245,580 cubic yards of fill. The anticipated fill range is 0-24 feet and the cut range is 0-39 feet. Existing Small structures on the site need to be demolished and removed from site. Because the conceptual site diagram for the main research building at the Kansas site uses a more compact footprint the anticipated cut and fill would be proportionally less at the other five sites if this diagram was used. As noted earlier, this compact footprint was used to accommodate the limited acreage available at Kansas. The other five sites provided enough acreage to use a more open footprint.
- Wetlands – No surface water is evident. Hydrophytic vegetation and/or hyrdic soils were not verified during this limited review. The site contains 2 storm water detention basins. These basins are isolated from other waters of the US.
- Transportation Infrastructure - The proposed main entrance to the site from Denison Avenue is expected to be able to support the proposed use with no major upgrades. There is still the possibility despite being on a college campus, that a left turning lane and deceleration and acceleration lanes could be required by the city. An exit only road (which is intended for emergency evacuations) would be located along the south side of the site. Possible realignment of Serum Plant Road and/or the NBAF Property Line needs to be adjusted as currently Serum Plant Road crosses both the proposed boundary line as well as the 181-foot security setback.

c. (C) Flora, Mississippi:

- Earthwork - It is anticipated that the earthwork can be balance on-site with **166,089 cubic yards of cut** and 137,176 cubic yards of fill. The anticipated fill range is 0-14 feet and the cut range is 0-20 feet.
- Wetlands – There are two watercourses located near the south east corner of the site that meet the definition of jurisdictional streams however the site concept is located in the northern portion of the site thus does not impact these features. A pond and detention pond are also located on the site however neither is impacted by the NBAF program.
- Transportation Infrastructure - The property fronts U.S. Highway 49, which is a 4 lane divided highway, and the proposed entrance aligns with an existing median break. It is anticipated that a left turn lane (south bound Highway 49) would be needed, as well as typical acceleration and deceleration lanes at the entrance drive. An exit only road is also indicated.

d. (D) Butner, North Carolina:

- Earthwork - It is anticipated that the earthwork can balance onsite with **244,235 cubic yards of cut** and 216,701 cubic yards of fill. The anticipated fill range is 0-37 feet and the cut range is 0-33 feet.
- Wetlands - The site contains several delineated wetland areas that require careful planning to avoid environmental impact. Areas that met the criteria to be considered a wetland or jurisdictional water were flagged. These on-site wetlands consist of head water forest wetlands, wetland seeps, and wet herbaceous assemblage. No known population of endangered species occurs within a one-mile radius
- Transportation Infrastructure - It is anticipated that approximately 1,100 feet of entrance paving to the immediate property line would be required and an additional 4,100 of road improvements of what appears to be a dirt road, would be necessary to connect the site to Range Road. The driveway would need to be constructed with a gate onsite. It is expected that Range Road can support the facility with its current condition and no major road upgrades are necessary. There may be a need for deceleration and acceleration lanes and a left turn lane at the driveway entrance to facilitate traffic flow.

e. (E) Plum Island, New York:

- Earthwork - It is anticipated that the earthwork would generate approximately **215,000 cubic yards of excess material** with 264,544 cubic yards of cut and 49,242 cubic yards of fill. This roughly translates to 5 feet of fill over a 25 acre area. Fortunately there appears to be sufficient area on the island to “lose” the excess material. Fills range from 0-16 feet and cuts from 0-30 feet.
- Wetlands – Long Island Sound is located adjacent to the site to the north and unnamed wetlands are located approximately 500 feet to the south.

Both tidal and freshwater wetlands are also present on the Island however wetlands do not occur on the proposed expansion site.

- o Transportation Infrastructure - It is assumed that the existing warehouse and loading facilities are sufficient to handle the increased deliveries. Depending on staffing levels, residency (NY or CT) and shift schedules, additional and /or larger passenger ferry boats may be needed but have not been considered as part of this analysis.

f. (F) San Antonio, Texas:

- o Earthwork - It is anticipated that the earthwork can balance onsite with **324,900 cubic yards of cut** and 277,165 of fill. The anticipated fill range is 0-26 feet and the cut range is 0-31 feet. It should be noted that the final site design may likely be able to reduce the overall earthwork quantities by as much as 20% by rotating the program almost 180-degress.
- o Wetlands – No surface water or wetland features are evident.
- o Transportation Infrastructure - Other than the new facility entrance and emergency exit off of Lambda Drive, no other improvements are anticipated to the existing Research Park road network, or to the main roadways leading to the Park.

2.3.4. Utility Infrastructure Costs – DHS submitted a request to each site consortia to determine and verify that the local utility provider is capable of delivering the required utilities to meet the demands necessary to support the NBAF program. The information below represents the final review and evaluation of this information. This report analyzes that the consortia have understood NBAF's program requirements and that they have the infrastructure available and or to document any infrastructure upgrades that may be required.

a. (A) Athens, Georgia - Utilities - Power, water and gas can be run directly from South Milledge Avenue along the proposed entrance drive directly into the CUP.

- o Electricity – Georgia Power has stated that they can supply the required electrical service to meet NBAF's program loads off of a nearby transmission line by providing two new 25 MVA transformers in a dedicated substation. The two substations along with the two direct bury loops would provide a redundant power supply. The estimated cost for this infrastructure is [redacted]
- o Water – The current off-site water supply is inadequate to supply NBAF with the required redundant feeds while still meeting the peak water demand. Athens-Clarke County proposes to meet this requirement by installing a new 200,000 gallon elevated water tank on-site connected to an existing 8-inch main off of either Milledge Avenue or Whitehall Road. This option is estimated to cost [redacted] If this option is not acceptable a more costly option would be to extend two new 12-inch water mains for an estimated total of $3,700,000.00. Further evaluation is required before a final decision can be made as to which option meets the program requirements.
- o Sewer – It is anticipated that the sanitary sewer would be collected outside the basement level and be pumped via a pump station provided

by the NBAF project a total of **9,500** feet from the facility to a gravity line at a soccer complex located northwest on South Milledge Avenue. There would be some off-site infrastructure improvements required to meet the NBAF program demands. An off-site lift station and associated force main construction would also be required. These infrastructure improvements are estimated to cost [redacted].

- Gas – The infrastructure for non-interruptible gas supply would need to be added. This cost is estimated at [redacted]
- Telephone and Data – AT&T has fiber running along S. Milledge Avenue and is capable of meeting NBAF's program needs without any infrastructure upgrades.

b. (B) Manhattan, Kansas: Utilities - The proposed site indicates that all the required services run across the site or are adjacent to the property.

- Electricity – There is an existing adjacent Westar Power substation just west of the proposed CUP. Existing lines traversing the site are relocated north of the proposed CUP and a new power line can be installed from the existing power facility to the CUP. Medium voltage power at 34.5 kV and 12.7 kV is available to provide two feeders. No infrastructure upgrade costs are anticipated.
- Water – An existing 24-inch water main running easterly through the site would be re-located just north of the building with taps for the water. This line is part of a loop system and thus provides the required redundancy criteria. No infrastructure upgrade costs are anticipated.
- Sewer – The sanitary sewer would exit at the basement level of the facility and be routed to a force main system near the BRI facility. A new pump station would be required to be installed on the existing forcemain to receive the BRI pumped effluent and NBAF's gravity fed effluent. Storm would also be collected on-site and routed to the existing storm sewer system which runs adjacent to the site. The anticipated infrastructure costs for this is [redacted].
- Gas – An existing 8-inch gas line has been confirmed to meet preliminary demand figures. No infrastructure upgrade costs are anticipated.
- Telephone and Data – AT&T has confirmed that NBAF would be a new demarcation address and that they would provide connectivity to the site at no additional charge.

c. (C) Flora, Mississippi: Utilities – The proposed site indicates that all the required services run across the site or are adjacent to the property. It should be noted that given the locations of the existing utilities, the service connections would not be 'bundled", but rather each in its own excavation.

- Electricity – Power is available via an existing 115,000 kV overhead transmission line, with the capability to serve from two sources, which runs in an easement along the front portion of the property. A connection would be made using an underground service into the CUP. A new

substation would be required with two transformers both capable of serving 13,800 volts. Anticipated infrastructure cost would be [redacted]

- Water – There is an existing 10-inch water line running along U.S. Highway 49 from which a service line could be connected and routed by the proposed entry drive to the CUP. No infrastructure upgrade costs are anticipated. Water capacity and redundancy was not specifically addressed by the Mississippi Consortium and needs to be confirmed.
- Sewer – It is anticipated that sanitary sewer would be collected outside the basement level and be connected via a gravity line to the existing 10-inch gravity sewer that is stubbed into the southeastern corner of the site. This line then runs under the railroad tracks into a pump station that utilizes a 6-inch forcemain to send the effluent to the sanitary treatment plant (STP). No infrastructure upgrade costs are anticipated.
- Gas – An existing 6-inch gas line runs along the eastern (far) side of the railroad tracks the area adjacent to the rear of the property. A connection to this line would require the line to be bored under the tracks. No infrastructure upgrade costs are anticipated.
- Telephone and Data – No information provided and service needs to be confirmed by the Mississippi Consortium.

d. (D) Butner, North Carolina: Utilities - The proposed site indicates that all the required services are available however these services are over 2,500 feet to the closets connection point along Hwy 75. Other than costs there may also be challenges with procuring the necessary right of ways.

- Electricity – Duke Energy potential solution for meeting NBAF's dual source requirements entails the use of the nearby 100 kV transmission system. A double circuit 100 kV transmission line currently serves Butner Retail. Duke has the capability of tapping those two circuits and bringing them the 2 miles to the site. Step down to the necessary 24 kV distribution voltage would then occur on the NBAF site. Duke would need to procure the rights of way to build this line since none are currently in place. Because of the confidence in the maintenance of the transmission system, and because of its historically strong reliability performance, Duke would propose to use a single tower line carrying both circuits to the site. The cost of this solution is estimated at approximately [redacted].
- Water – Water service is available however is over 2,500 feet to the closets connection point along Hwy 75. The North Carolina site Consortium confirmed that their system was capable of supporting NBAF's program water demands however no real detail was provided for capacity and or redundancy. Further investigation is warranted.
- Sewer – It is anticipated that sanitary sewer would be collected outside the basement level and is required to be routed approximately 2,500 feet from the facility to an existing gravity line south of the property running along Hwy. 75. The North Carolina site Consortium confirmed that their system was capable of supporting NBAF's program sewer demands however no detail was provided. Further investigation is warranted.

- Gas – PSNC Energy has an existing 8" steel gas main running along Hwy 75, adjacent to the utility channel which would feed the proposed central utility plant (CUP). PSNC Energy facilities serving the CUP would be designed to be both adequate and highly reliable in order to provide service to the mission critical program of the NBAF campus. No infrastructure upgrade costs are anticipated.
- Telephone and Data – No information provided and service needs to be confirmed by the North Carolina Consortium.

e. (E) Plum Island, New York: With the exception of electricity, all the utilities are self sufficient to the island.

- Utilities –

  a. Water - Water consumption ranges between **50,000 and 200,000** gallons per day with a peak flow rate of 636 GPM. The maximum value includes cooling tower make-up water for peak cooling days during the summer months and would be less other times of the year. The estimated total annual water consumption is 36,500,000 gallons.

     To meet these requirements a new well(s) should be added to ensure a minimum daily draw of 200,000 gallons. An additional 200,000 gallon water tower should also be added to allow storage of two days of water consumption during peak periods.

  b. Sanitary - Discharge to the sanitary system ranges between **50,000 and 125,000** gallons per day with an annual estimated discharge of 23,000,000 gallons. Given that the existing system has a capacity of only 80,000 GPD it does not meet flows on some of the peak demand days. Therefore, a new waste treatment plant would need to be constructed as the existing plant is not capable of accommodating the anticipated loads from NBAF. This new plant would also be required to be permitted for an annual treatment capacity with SPDES. Pre-treatment of animal feed solids removal carryover would also be required.

  c. Electricity - The total normal power load required to accommodate the specific site infrastructure loads as well as the typical building load is approximated at 12.8 MW. A minimum of two redundant medium voltage services with multiple feeders are required to serve the facilities and Plum Island infrastructure.

     The addition of the NBAF Facility electrical loads would require the installation of **(2) new undersea cables** from Long Island Power Authority (LIPA) at Orient Point or from Connecticut Lighting & Power (CL&P)

     An Assumption regarding LIPA's ability to provide the additional service (Plum Island is at the end of a 70-80 mile transmission line from the generation point) has been made pending confirmation from LIPA of the available capacities from their distribution grid to support upgrades to the Orient Point supply service.

f. (F) San Antonio, Texas: Utilities - The proposed site indicates that all the required services run adjacent to the property.

- Electricity – There is an existing electrical service connection along Omnicron Drive that is fed from a new substation that can meet NBAF's dual feed program loads of 34.5 kV. No infrastructure upgrade costs are anticipated.
- Water – There are existing water lines (16-inch lines) running along Lambda Drive, which runs along the easterly side of the site which meet NBAF's program requirements. No infrastructure upgrade costs are anticipated.
- Sewer – It is anticipated that sanitary sewer would be collected outside the basement level and be connected via a gravity line to the existing 8-inch gravity sewer that runs along the northern side of the site, in the R.O.W. of the proposed Omnicron Drive extension, parallel with the existing gas line. No infrastructure upgrade costs are anticipated.
- Gas – An existing high pressure gas line runs along the northern side of the site, in the R.O.W. of the proposed Omnicron Drive extension. The gas service to the CUP would run along Lambda Drive, parallel to the power and water services. No infrastructure upgrade costs are anticipated.
- Telephone and Data – AT&T has confirmed that they can meet NBAF's program capacity and would run the required line to the site at no charge if a contract is signed with them.

2.3.5. Central Utility Plant Costs – The cost of the central utility plant includes the following components:

- The facility itself.
- The steam generating and chilled water generating equipment.
- Associated auxiliaries and electrical system to support the plant.
- Emergency/standby power generation system consisting of diesel engine generators.
- An on-site fuel storage system to support the operation of the facility for a period of thirty days.
- Estimated costs to fill the on-site fuel storage tanks for initial use.

The CUP would be served by utilities including natural gas, medium voltage power, and water and sewer services from the local utility providers.

The following tables represent the estimated required utility capacities applied against an estimated cost for each system listed to determine a total installed cost for the Central Utility Plant (CUP). These tables include costs for the above ground fuel storage yard and costs associated with filling these tanks for initial use.

| Central Utility Plant Cost Estimate | | | |
|---|---|---|---|
| **Athens, Georgia** | Installed Capacity | Cost per unit of installed capacity | Estimated Installed Cost |
| | | | |
| Installed Chiller Capacity, (tons) | **6240** | | |
| Installed Boiler Capacity, (BHP)* | **4650** | | |
| Normal Power Capacity, (kW) | **12800** | | |
| Stand-by Power Capacity, (kW) | **14200** | | |
| **Estimated Subtotal for Equipment** | | | |
| **Estimated Subtotal for Above Ground Fuel Storage (550,000 Gal - 30 Day Supply)** | | | |
| **Estimated Subtotal for Fuel Oil (550,000 Gal @$3.00/Gal)** | | | |
| **Estimated Subtotal Cost for CUP** | | | |
| **Estimated Total Cost for CUP with Area Adjustment Factor (0.95)** | | | |

* 1 BHP = 34.5 lb/hr

**Costs are based on:**

| |
|---|
| 1. $2800 ton Chiller Capacity (includes MEP & building shell, but no exterior tunnels or distribution; electrical service in included under normal power below) |
| 2. $3000 BHP Boiler Capacity (includes MEP & building shell, but no exterior tunnel or distribution) |
| 3. $225 kW Normal Power Capacity (includes primary system for building and CUP) |
| 4. $1200 kW Standby Power Capacity (includes standby power for building and CUP; includes one redundant generator for all options; entire building load and most of CUP load is included in generator load) |
| 5. The cost for the building is estimated to be included as part of the unit costs applied to each system as noted above. |
| 6. The total estimated cost noted above for the CUP represents 2008 dollars. This cost represents the site specific engineering anlysis which includes the quantity and size of systems based on the location of the facility. |
| 7. The costs above represent an above ground fuel storage yard. A site specific risk assessment will be performed once the final site is determined and may impact the type of fuel storage yard allowed. If a below ground fuel storage yard is required then the estimated cost for that line item above would be doubled. |

Table 2.3.5.A1 – Site Specific Central Utility Plant Costs – Athens, Georgia

| Central Utility Plant Cost Estimate | | | |
|---|---|---|---|
| **Manhattan, Kansas** | Installed Capacity | Cost per unit of installed capacity | Estimated Installed Cost |
| | | | |
| Installed Chiller Capacity, (tons) | | | |
| Installed Boiler Capacity, (BHP)* | | | |
| Normal Power Capacity, (kW) | | | |
| Stand-by Power Capacity, (kW) | | | |
| Estimated Subtotal for Equipment | | | |
| Estimated Subtotal for Above Ground Fuel Storage (650,000 Gal - 30 Day Supply) | | | |
| Estimated Subtotal for Fuel Oil (650,000 Gal @$3.00/Gal) | | | |
| Estimated Subtotal Cost for CUP | | | |
| Estimated Total Cost for CUP with Area Adjustment Factor (0.97) | | | |

* 1 BHP = 34.5 lb/hr

**Costs are based on:**

| |
|---|
| 1. $2800 ton Chiller Capacity (includes MEP & building shell, but no exterior tunnels or distribution; electrical service in included under normal power below) |
| 2. $3000 BHP Boiler Capacity (includes MEP & building shell, but no exterior tunnel or distribution) |
| 3. $225 kW Normal Power Capacity (includes primary system for building and CUP) |
| 4. $1200 kW Standby Power Capacity (includes standby power for building and CUP; includes one redundant generator for all options; entire building load and most of CUP load is included in generator load) |
| 5. The cost for the building is estimated to be included as part of the unit costs applied to each system as noted above. |
| 6. The total estimated cost noted above for the CUP represents 2008 dollars. This cost represents the site specific engineering anlysis which includes the quantity and size of systems based on the location of the facility. |
| 7. The costs above represent an above ground fuel storage yard. A site specific risk assessment will be performed once the final site is determined and may impact the type of fuel storage yard allowed. If a below ground fuel storage yard is required then the estimated cost for that line item above would be doubled. |

Table 2.3.5.B1 – Site Specific Central Utility Costs - Kansas

| Central Utility Plant Cost Estimate | | | |
|---|---|---|---|
| **Flora, Mississippi** | Installed Capacity | Cost per unit of installed capacity | Estimated Installed Cost |
| | | | |
| Installed Chiller Capacity, (tons) | **6600** | | |
| Installed Boiler Capacity, (BHP)* | **4625** | | |
| Normal Power Capacity, (kW) | **13100** | | |
| Stand-by Power Capacity, (kW) | **14500** | | |
| **Estimated Subtotal for Equipment** | | | |
| **Estimated Subtotal for Above Ground Fuel Storage (550,000 Gal - 30 Day Supply)** | | | |
| **Estimated Subtotal for Fuel Oil (550,000 Gal @$3.00/Gal)** | | | |
| **Estimated Subtotal Cost for CUP** | | | |
| **Estimated Total Cost for CUP with Area Adjustment Factor (0.90)** | | | |

* 1 BHP = 34.5 lb/hr

**Costs are based on:**

| |
|---|
| 1. $2800 ton Chiller Capacity (includes MEP & building shell, but no exterior tunnels or distribution; electrical service in included under normal power below) |
| 2. $3000 BHP Boiler Capacity (includes MEP & building shell, but no exterior tunnel or distribution) |
| 3. $225 kW Normal Power Capacity (includes primary system for building and CUP) |
| 4. $1200 kW Standby Power Capacity (includes standby power for building and CUP; includes one redundant generator for all options; entire building load and most of CUP load is included in generator load) |
| 5. The cost for the building is estimated to be included as part of the unit costs applied to each system as noted above. |
| 6. The total estimated cost noted above for the CUP represents 2008 dollars. This cost represents the site specific engineering anlysis which includes the quantity and size of systems based on the location of the facility. |
| 6. The total estimated cost noted above for the CUP represents 2008 dollars. This cost represents the site specific engineering anlysis which includes the quantity and size of systems based on the location of the facility. |
| 7. The costs above represent an above ground fuel storage yard. A site specific risk assessment will be performed once the final site is determined and may impact the type of fuel storage yard allowed. If a below ground fuel storage yard is required then the estimated cost for that line item above would be doubled. |

Table 2.3.5.C1 – Site Specific Central Utility Costs – Mississippi

| Central Utility Plant Cost Estimate | | | |
|---|---|---|---|
| **Butner, North Carolina** | Installed Capacity | Cost per unit of installed capacity | Estimated Installed Cost |
| | | | |
| Installed Chiller Capacity, (tons) | [redacted] | | |
| Installed Boiler Capacity, (BHP)* | | | |
| Normal Power Capacity, (kW) | | | |
| Stand-by Power Capacity, (kW) | | | |
| **Estimated Subtotal for Equipment** | | | [redacted] |
| **Estimated Subtotal for Above Ground Fuel Storage (600,000 Gal - 30 Day Supply)** | | | |
| **Estimated Subtotal for Fuel Oil (600,000 Gal @$3.00/Gal)** | | | |
| **Estimated Subtotal Cost for CUP** | | | |
| **Estimated Total Cost for CUP with Area Adjustment Factor (0.95)** | | | |

* 1 BHP = 34.5 lb/hr

**Costs are based on:**

| |
|---|
| 1. $2800 ton Chiller Capacity (includes MEP & building shell, but no exterior tunnels or distribution; electrical service in included under normal power below) |
| 2. $3000 BHP Boiler Capacity (includes MEP & building shell, but no exterior tunnel or distribution) |
| 3. $225 kW Normal Power Capacity (includes primary system for building and CUP) |
| 4. $1200 kW Standby Power Capacity (includes standby power for building and CUP; includes one redundant generator for all options; entire building load and most of CUP load is included in generator load) |
| 5. The cost for the building is estimated to be included as part of the unit costs applied to each system as noted above. |
| 6. The total estimated cost noted above for the CUP represents 2008 dollars. This cost represents the site specific engineering anlysis which includes the quantity and size of systems based on the location of the facility. |
| 7. The costs above represent an above ground fuel storage yard. A site specific risk assessment will be performed once the final site is determined and may impact the type of fuel storage yard allowed. If a below ground fuel storage yard is required then the estimated cost for that line item above would be doubled. |

Table 2.3.5.D1 – Site Specific Central Utility Costs – North Carolina

| Central Utility Plant Cost Estimate | | | |
|---|---|---|---|
| **Plum Island, New York** | Installed Capacity | Cost per unit of installed capacity | Estimated Installed Cost |
| | | | |
| Installed Chiller Capacity, (tons) | **5640** | | |
| Installed Boiler Capacity, (BHP)* | **4200** | | |
| Normal Power Capacity, (kW) | **12400** | | |
| Stand-by Power Capacity, (kW) | **13750** | | |
| **Estimated Subtotal for Equipment** | | | |
| **Estimated Subtotal for Above Ground Fuel Storage (660,000 Gal - 30 Day Supply)** | | | |
| **Estimated Subtotal for Fuel Oil (660,000 Gal @$3.00/Gal)** | | | |
| **Estimated Subtotal Cost for CUP** | | | |
| **Estimated Total Cost for CUP with Area Adjustment Factor (1.32)** | | | |

* 1 BHP = 34.5 lb/hr

**Costs are based on:**

| |
|---|
| 1. $2800 ton Chiller Capacity (includes MEP & building shell, but no exterior tunnels or distribution; electrical service in included under normal power below) |
| 2. $3000 BHP Boiler Capacity (includes MEP & building shell, but no exterior tunnel or distribution) |
| 3. $225 kW Normal Power Capacity (includes primary system for building and CUP) |
| 4. $1200 kW Standby Power Capacity (includes standby power for building and CUP; includes one redundant generator for all options; entire building load and most of CUP load is included in generator load) |
| 5. The cost for the building is estimated to be included as part of the unit costs applied to each system as noted above. |
| 6. The total estimated cost noted above for the CUP represents 2008 dollars. This cost represents the site specific engineering anlysis which includes the quantity and size of systems based on the location of the facility. |
| 7. Boiler redundancy assumed to be provided by existing plant. |
| 8. The costs above represent an above ground fuel storage yard. A site specific risk assessment will be performed once the final site is determined and may impact the type of fuel storage yard allowed. If a below ground fuel storage yard is required then the estimated cost for that line item above would be doubled. |

Table 2.3.5.E1 – Site Specific Central Utility Costs – New York

| Central Utility Plant Cost Estimate | | | |
|---|---|---|---|
| **San Antonio, Texas** | Installed Capacity | Cost per unit of installed capacity | Estimated Installed Cost |
| | | | |
| Installed Chiller Capacity, (tons) | [redacted] | | |
| Installed Boiler Capacity, (BHP)* | | | |
| Normal Power Capacity, (kW) | | | |
| Stand-by Power Capacity, (kW) | | | |
| **Estimated Subtotal for Equipment** | | | [redacted] |
| **Estimated Subtotal for Above Ground Fuel Storage (550,000 Gal - 30 Day Supply)** | | | |
| **Estimated Subtotal for Fuel Oil (550,000 Gal @$3.00/Gal)** | | | |
| **Estimated Subtotal Cost for CUP** | | | |
| **Estimated Total Cost for CUP with Area Adjustment Factor (0.90)** | | | |

* 1 BHP = 34.5 lb/hr

**Costs are based on:**

| |
|---|
| 1. $2800 ton Chiller Capacity (includes MEP & building shell, but no exterior tunnels or distribution; electrical service in included under normal power below) |
| 2. $3000 BHP Boiler Capacity (includes MEP & building shell, but no exterior tunnel or distribution) |
| 3. $225 kW Normal Power Capacity (includes primary system for building and CUP) |
| 4. $1200 kW Standby Power Capacity (includes standby power for building and CUP; includes one redundant generator for all options; entire building load and most of CUP load is included in generator load) |
| 5. The cost for the building is estimated to be included as part of the unit costs applied to each system as noted above. |
| 6. The total estimated cost noted above for the CUP represents 2008 dollars. This cost represents the site specific engineering anlysis which includes the quantity and size of systems based on the location of the facility. |
| 7. The costs above represent an above ground fuel storage yard. A site specific risk assessment will be performed once the final site is determined and may impact the type of fuel storage yard allowed. If a below ground fuel storage yard is required then the estimated cost for that line item above would be doubled. |

Table 2.3.5.F1 – Site Specific Central Utility Costs – Texas

2.3.6. Site Security Systems & Equipment Costs – [redacted]

a. (A) Athens, Georgia:

[redacted]

b. (B) Manhattan, Kansas:

[redacted]

c. (C) Flora, Mississippi:

[redacted]

d. (D) Butner, North Carolina:

[redacted]

e. (E) Plum Island, New York:

[redacted]

f. (F) San Antonio, Texas:

[redacted]

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2.3.7. Site Specific Costs & Quantity Tables

The following tables represent the estimated site specific construction costs and project budgets.

- The **NBAF Baseline Project Budget** indicates how the costs were originally estimated prior to development of the Feasibility Study, EIS, Site Characterization Study or Site Cost Analysis. This information is intended to serve as a point of reference. See table 2.3.7.1.
- The **APB Site Estimate Comparison** is intended to show all related construction and management costs between each site in one summary table. See table 2.3.7.2.
- The **Site Specific Quantities and Costs** tables represent estimates related to how each site affects the NBAF program as indicated in the site concept diagrams dated May 2, 2008. These tables address the anticipated earthwork, roadways, security fencing, utilities & infrastructure and central utility plant. These costs do not take into account the area adjustment factor and are meant to provide more of a quantitative review of each site.
- The **Project Estimate Summary** tables represent all cost associated with and required to support the NBAF program. These tables address building costs, utilities & infrastructure, sitework, technology systems, escalation, contingency and fees.
- The **Site Specific Construction Costs Comparison** table represents only the estimated site specific construction costs associated with sitework, utilities and buildings and provides a comparison between each of the sites. These costs do not represent the complete project budget as escalation, fees and contingency are not included due to the fact that these costs are consistent across all six sites. These costs do take into account the area adjustment factor.

| Category | Category Description | Baseline |
|---|---|---|
| Planning/Project Development | Includes Planning, Pre-Design Feasibility Studies and Analyses, Site Selection costs, Environmental Impact Statement (EIS), Technical/Public Outreach Support Fees | $7,000,000 |
| Conceptual Design | | $5,000,000 |
| Architectural/Engineering Design Costs | Includes architectural, engineering, and design fees, etc. | $45,000,000 |
| Commissioning | Commissioning agent fees | $4,000,000 |
| CMc Pre-Construction/Construction | Bricks and mortar construction (research building, cGMP space, guardhouse, paddocks, transfer center, office furniture, signage, security infrastructure and equipment, information technology infrastructure, which includes raceways, cable trays, data rooms | $390,000,000 |
| Total | | **$451,000,000** |

Table 2.3.7.1 – Original NBAF Baseline Project Budget

| Category | Category Description | Fall 2008 | GA Estimate May 2, 2008 | KS Estimate May 2, 2008 | MS Estimate May 2, 2008 | NC Estimate May 2, 2008 | NY Estimate May 2, 2008 | TX Estimate May 2, 2008 | Average Across all 6 Sites | Average Across 4 Median Sites |
|---|---|---|---|---|---|---|---|---|---|---|
| Planning/Project Development | Includes Planning, Pre-Design Feasibility Studies and Analyses, Site Selection costs, Environmental Impact Statement (EIS), Technical/Public Outreach Support Fees | | | | | | | | | |
| Technical Document Review | Includes program/project management fees associated with contract administration, procurement services, specialty consultants, subject matter experts, cost evaluation, project and document management system archive, on-site construction supervision | | | | | | | | | |
| Architectural/Engineering Design Costs | Includes architectural, engineering, and design fees, etc. | | | | | | | | | |
| Commissioning | Commissioning agent fees | | | | | | | | | |
| Owner Management Contingencies | Includes project Owner contingencies for design and construction (identify percentage taken on each category) | | | | | | | | | |
| Subtotal Soft Costs | Planning, Management, A/E Fees, Commissioning & Owners Contingencies Costs | | | | | | | | | |
| CMc Pre-Construction/Construction | Bricks and mortar construction (research building, cGMP space, guardhouse, paddocks, transfer center, office furniture, signage, security infrastructure and equipment, information technology infrastructure, which includes raceways, cable trays, data rooms, sustainable design costs, CM pre-construction fee, construction contingency & escalation | | | | | | | | | |
| Sitework, Site Infrastructure & Utilities | Includes site infrastructure (earth work, roads, parking, fencing, utility distribution) and the central utility plant (structure, control room, engineering office, electrical duct banks, emergency generators, on-site fuel storage, possible on-site water storage, natural gas, water, and telecommunications supply and service vaults | | | | | | | | | |
| Subtotal Construction Costs | CMc Pre-Construction/Construction & Sitework Costs | | | | | | | | | |
| **Total Project Costs** | | $451,000,000 | $679,965,515 | $724,551,494 | $648,229,703 | $677,289,729 | $939,326,684 | $652,377,478 | $720,290,100 | $682,509,110 |

Table 2.3.7.2 – APB Site Estimate Comparison

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# 2 – Site Specific Cost Estimates

The following tables represent the estimated site specific construction costs and project estimates.

**Reference Tables 2.3.7.A1 thru 2.3.7.F2**

a. (A) Athens, Georgia:

**Athens, Georgia - Site Specific Quantities and Costs**

| I | Facility Description | Quantities | | Unit Prices | Cost |
|---|---|---|---|---|---|
| | Main Research Building | 504,000 | gsf | | Reference only |
| | cGMP | 13,000 | gsf | | Reference only |
| | Gate House | 1,000 | gsf | | Reference only |
| | Central Receiving | 22,000 | gsf | | Reference only |
| | | | | | |
| **II Estimated Site Costs Summary** | | | | | |
| 1. Earthwork | Site cut, per Engineer | 292,678 | cy | | |
| | Site fill, per Engineer | 254,840 | cy | | |
| | Select fill | 0 | cy | | |
| | Haul off-site | 0 | cy | | |
| | Haul/site disperse | 37,838 | cy | | |
| | | | | | |
| | Basement cut | 144,984 | cy | | |
| | Basement backfill, select | 23,838 | cy | | |
| | Basement haul/site disperse | 168,822 | cy | | |
| | Basement haul/off-site | 0 | cy | | |
| 2. Roadways /Parking | Parking | 120,000 | sf | | |
| | Entry roadway | 84,400 | sf | | |
| | Entry roadway, curbs | 5,800 | lf | | |
| | Interior circulation roads and loading areas | 162,400 | sf | | |
| | Interior circulation roads and loading areas, curbs | 9,450 | lf | | |
| | Perimeter security drive | 147,750 | sf | | |
| | Perimeter security drive, curbs | 9,850 | lf | | |
| | Public highway paving | 0 | sf | | |
| | Connecting road to main highway | 0 | sf | | |
| | Connecting road to main highway, curbs | 0 | lf | | |
| | Entry walks | 26,750 | sf | | |
| 3. Fencing | Perimeter fence | 6,750 | lf | | |
| | Interior fence | 7,950 | lf | | |
| 4. Utility Distribution | Water (W) | 2,650 | lf | | |
| | Off-Site Water Upgrades (OW) | 800,000 | ls | | |
| | Gas (G) | 2,650 | lf | | |
| | Off-Site Gas Upgrades (OG) | 500,000 | ls | | |
| | Power (P) | 2,650 | lf | | |
| | Off-Site Power Upgrades (OP) | 3,564,712 | ls | | |
| | Relocate Overhead Power (P) | 0 | lf | | |
| | Sanitary (S) | 3,400 | lf | | |
| | Off-Site Sanitary Upgrades (OS) | 2,500,000 | ls | | |
| | Force main (FM), on-site | 3,550 | lf | | |
| | Force main (FM), off-site | 5,800 | lf | | |
| | Lift station | 1 | ea | | |
| | Sanitary manhole | 13 | ea | | |
| | Site lighting, per paved area | 514,550 | sf | | |
| 5. CUP | Central Utility Plant | 1 | ea | | |

Table 2.3.7.A1 – Site Specific Quantity and Cost Breakdown Georgia

| PROJECT ESTIMATE SUMMARY - Athens, GA | | Project Costs |
|---|---|---|
| **CMc Pre-Construction/Construction** | | |
| **Buildings & Misc.** | | |
| Main Research Building & cGMP Cost | | |
| Gatehouse | | |
| Central Receiving | | |
| Security (Allowance) | | |
| IT (Allowance) | | |
| **Sitework, Site Infrastructure & Utilities** | | |
| Central Utility Plant (Table 2.3.5.A1 - CUP) | | |
| Site Utilities (Table 2.3.7.A1 - Utility Distribution) | | |
| Sitework (Table 2.3.7.A1 - Earthwork, Roads/Parking, Fencing) | | |
| **Technology Systems** | | |
| Telephones & Equip (Allowance) | | |
| Preliminary Construction Estimate | | |
| Construction Estimate Escalated to 2008 | | |
| **Construction Estimate w/ Area Adjustment Factor** | | |
| Sustainable Design (Allowance) | | |
| CM Pre-Construction Fee | | |
| CM Construction Contingency | | |
| Escalation 2009 | | |
| Escalation 2010 | | |
| Escalation 2011 | | |
| Escalation 2012 | | |
| **Subtotal of Escalation, Sust Design, Pre-Const & Const Cont** | | |
| CMc Fee & General Conditions | | |
| Office Furniture (Allowance) 326 staff x $7,500/office | | |
| Signage (Allowance) | | |
| **Total Construction Costs** | | |
| **Architectural/Engineering Design Costs** | | |
| Design Phase Fee | | |
| Construction Administration Fee | | |
| **Commissioning** | | |
| **Planning/Project Development** | | |
| Environmental Impact Statement Contract | | |
| Conceptual Design & Feasibility Study | | |
| Site Characterization Study & Site Cost Analysis | | |
| Technical/Public Outreach Support Fees | | |
| Sandia National Labs Support | | |
| **Technical Document Review** | | |
| Project Management & Technical Support | | |
| Elevator Inspection (Allowance) | | |
| Materials Testing Support (Allowance) | | |
| Fire Protection Engineering Consultant (Allowance) | | |
| On-Site Construction Management | | |
| **Owner Management Contigencies** | | |
| Owners EIS Contingency | | |
| Owners Construction Contingency | | |
| Owners Design Contingency | | |
| Owners CA Services Contingency | | |
| Owners Commissioning Contingency | | |
| Owners FF&E Contingency | | |
| **Furniture, Fixtures & Equipment** | | |
| Moveable Scientific Equipment (Allowance) NIC | $ | |
| **Subtotal of Soft Costs** | | |
| **TOTAL PROJECT ESTIMATE** | | **$679,965,515** |

Table 2.3.7.A2 – Site Specific Project Estimate Breakdown Georgia

b. (B) Manhattan, Kansas:

**Manhattan, Kansas - Site Specific Quantities and Costs**

| I | Facility Description | Quantities | | Unit Prices | Cost |
|---|---|---|---|---|---|
| | Main Research Building | 504,000 | gsf | | For Reference only |
| | cGMP | 13,000 | gsf | | For Reference only |
| | Gate House | 1,000 | gsf | | Reference only |
| | Central Receiving | 22,000 | gsf | | Reference only |
| | | | | | |
| **II Estimated Site Costs Summary** | | | | | |
| 1. Earthwork | Site cut, per Engineer | 284,770 | cy | | |
| | Site fill, per Engineer | 245,580 | cy | | |
| | Select fill | 0 | cy | | |
| | Haul off-site | 0 | cy | | |
| | Haul/site disperse | 39,190 | cy | | |
| | | | | | |
| | Basement cut | 202,601 | cy | | |
| | Basement backfill, select | 35,509 | cy | | |
| | Basement haul/site disperse | 0 | cy | | |
| | Basement haul/off-site | 238,111 | cy | | |
| 2. Roadways /Parking | Parking | 105,000 | sf | | |
| | Entry roadway | 28,400 | sf | | |
| | Entry roadway, curbs | 1,900 | lf | | |
| | Interior circulation roads and loading areas | 134,350 | sf | | |
| | Interior circulation roads and loading areas, curbs | 7,900 | lf | | |
| | Perimeter security drive | 107,000 | sf | | |
| | Perimeter security drive, curbs | 8,350 | lf | | |
| | Public highway paving | 0 | sf | | |
| | Connecting road to main highway | 0 | sf | | |
| | Connecting road to main highway, curbs | 0 | lf | | |
| | Entry walks | 17,850 | sf | | |
| 3. Fencing | Perimeter fence | 5,950 | lf | | |
| | Interior fence | 5,650 | lf | | |
| 4. Utility Distribution | Water (W) | 1,350 | lf | | |
| | Off-Site Water Upgrades (OW) | 0 | ls | | |
| | Gas (G) | 1,300 | lf | | |
| | Off-Site Gas Upgrades (OG) | 0 | ls | | |
| | Power (P) | 1,850 | lf | | |
| | Off-Site Power Upgrades (OP) | 0 | ls | | |
| | Relocate Overhead Power (P) | 0 | lf | | |
| | Sanitary (S) | 3,500 | lf | | |
| | Off-Site Sanitary Upgrades (OS) | 50,000 | ls | | |
| | Force main (FM), on-site | 0 | lf | | |
| | Force main (FM), off-site | 0 | lf | | |
| | Lift station | 1 | ea | | |
| | Sanitary manhole | 15 | ea | | |
| | Site lighting, per paved area | 374,750 | sf | | |
| 5. CUP | Central Utility Plant | 1 | ea | | |

Table 2.3.7.B1 – Site Specific Quantity and Cost Breakdown Kansas

| PROJECT ESTIMATE SUMMARY - Manhattan, KS | | Project Costs |
|---|---|---|
| **CMc Pre-Construction/Construction** | | |
| **Buildings & Misc.** | | |
| Main Research Building & cGMP Cost | | |
| Gatehouse | | |
| Central Receiving | | |
| Security (Allowance) | | |
| IT (Allowance) | | |
| **Sitework, Site Infrastructure & Utilities** | | |
| Central Utility Plant (Table 2.3.5.B1 - CUP) | | |
| Site Utilities (Table 2.3.7.B1 - Utility Distribution) | | |
| Sitework (Table 2.3.7.B1 - Earthwork, Roads/Parking, Fencing) | | |
| **Technology Systems** | | |
| Telephones & Equip (Allowance) | | |
| Preliminary Construction Estimate | | |
| Construction Estimate Escalated to 2008 | | |
| **Construction Estimate w/ Area Adjustment Factor** | | |
| Sustainable Design (Allowance) | | |
| CM Pre-Construction Fee | | |
| CM Construction Contingency | | |
| Escalation 2009 | | |
| Escalation 2010 | | |
| Escalation 2011 | | |
| Escalation 2012 | | |
| **Subtotal of Escalation, Sust Design, Pre-Const & Const Cont** | | |
| CMc Fee & General Conditions | | |
| Office Furniture (Allowance) 326 staff x $7,500/office | | |
| Signage (Allowance) | | |
| **Total Construction Costs** | | |
| **Architectural/Engineering Design Costs** | | |
| Design Phase Fee | | |
| Construction Administration Fee | | |
| **Commissioning** | | |
| **Planning/Project Development** | | |
| Environmental Impact Statement Contract | | |
| Conceptual Design & Feasibility Study | | |
| Site Characterization Study & Site Cost Analysis | | |
| Technical/Public Outreach Support Fees | | |
| Sandia National Labs Support | | |
| **Technical Document Review** | | |
| Project Management & Technical Support | | |
| Elevator Inspection (Allowance) | | |
| Materials Testing Support (Allowance) | | |
| Fire Protection Engineering Consultant (Allowance) | | |
| On-Site Construction Management | | |
| **Owner Management Contigencies** | | |
| Owners EIS Contingency | | |
| Owners Construction Contingency | | |
| Owners Design Contingency | | |
| Owners CA Services Contingency | | |
| Owners Commissioning Contingency | | |
| Owners FF&E Contingency | | |
| **Furniture, Fixtures & Equipment** | | |
| Moveable Scientific Equipment (Allowance) NIC | | |
| **Subtotal of Soft Costs** | | |
| **TOTAL PROJECT ESTIMATE** | **$** | **724,551,494** |

Table 2.3.7.B2 – Site Specific Project Estimate Breakdown Kansas

c. (C) Flora, Mississippi:

**Flora, Mississippi - Site Specific Quantities and Costs**

| I | Facility Description | Quantities | | Unit Prices | Cost |
|---|---|---|---|---|---|
| | Main Research Building | 504,000 | gsf | | For Reference only |
| | cGMP | 13,000 | gsf | | For Reference only |
| | Gate House | 1,000 | gsf | | Reference only |
| | Central Receiving | 22,000 | gsf | | Reference only |
| | | | | | |
| **II Estimated Site Costs Summary** | | | | | |
| 1. Earthwork | Site cut, per Engineer | 166,089 | cy | | |
| | Site fill, per Engineer | 137,176 | cy | | |
| | Select fill | 0 | cy | | |
| | Haul off-site | 0 | cy | | |
| | Haul/site disperse | 34,910 | cy | | |
| | | | | | |
| | Basement cut | 35,491 | cy | | |
| | Basement backfill, select | 1,839 | cy | | |
| | Basement haul/site disperse | 37,330 | cy | | |
| | Basement haul/off-site | 0 | cy | | |
| 2. Roadways /Parking | Parking | 107,000 | sf | | |
| | Entry roadway | 13,900 | sf | | |
| | Entry roadway, curbs | 950 | lf | | |
| | Interior circulation roads and loading areas | 195,950 | sf | | |
| | Interior circulation roads and loading areas, curbs | 13,150 | lf | | |
| | Perimeter security drive | 140,850 | sf | | |
| | Perimeter security drive, curbs | 9,400 | lf | | |
| | Public highway paving | 27,600 | sf | | |
| | Connecting road to main highway | 0 | sf | | |
| | Connecting road to main highway, curbs | 800 | lf | | |
| | Entry walks | 24,000 | sf | | |
| 3. Fencing | Perimeter fence | 5,800 | lf | | |
| | Interior fence | 7,100 | lf | | |
| 4. Utility Distribution | Water (W) | 900 | lf | | |
| | Off-Site Water Upgrades (OW) | 0 | ls | | |
| | Gas (G) | 150 | lf | | |
| | Off-Site Gas Upgrades (OG) | 0 | ls | | |
| | Power (P) | 3,450 | lf | | |
| | Off-Site Power Upgrades (OP) | 8,000,000 | ls | | |
| | Relocate Overhead Power (P) | 0 | lf | | |
| | Sanitary (S) | 5,900 | lf | | |
| | Off-Site Sanitary Upgrades (OS) | 0 | ls | | |
| | Force main (FM), on-site | 0 | lf | | |
| | Force main (FM), off-site | 0 | lf | | |
| | Lift station | 0 | ea | | |
| | Sanitary manhole | 13 | ea | | |
| | Site lighting, per paved area | 457,700 | sf | | |
| 5. CUP | Central Utility Plant | 1 | ea | | |

Table 2.3.7.C1 – Site Specific Quantity and Cost Breakdown Mississippi

| PROJECT ESTIMATE SUMMARY - Flora, MS | | Project Costs |
|---|---|---|
| **CMc Pre-Construction/Construction** | | |
| **Buildings & Misc.** | | |
| Main Research Building & cGMP Cost | | |
| Gatehouse | | |
| Central Receiving | | |
| Security (Allowance) | | |
| IT (Allowance) | | |
| **Site Infrastructure & Utilities** | | |
| Central Utility Plant (Table 2.3.5.C1 - CUP) | | |
| Site Utilities (Table 2.3.7.C1 - Utility Distribution) | | |
| Sitework (Table 2.3.7.C1 - Earthwork, Roads/Parking, Fencing) | | |
| **Technology Systems** | | |
| Telephones & Equip (Allowance) | | |
| Preliminary Construction Estimate | | |
| Construction Estimate Escalated to 2008 | | |
| **Construction Estimate w/ Area Adjustment Factor** | | |
| Sustainable Design (Allowance) | | |
| CM Pre-Construction Fee | | |
| CM Construction Contingency | | |
| Escalation 2009 | | |
| Escalation 2010 | | |
| Escalation 2011 | | |
| Escalation 2012 | | |
| **Subtotal of Escalation, Sust Design, Pre-Const & Const Cont** | | |
| CMc Fee & General Conditions | | |
| Office Furniture (Allowance) 326 staff x $7,500/office | | |
| Signage (Allowance) | | |
| **Total Construction Costs** | | |
| **Architectural/Engineering Design Costs** | | |
| Design Phase Fee | | |
| Construction Administration Fee | | |
| **Commissioning** | | |
| **Planning/Project Development** | | |
| Environmental Impact Statement Contract | | |
| Conceptual Design & Feasibility Study | | |
| Site Characterization Study & Site Cost Analysis | | |
| Technical/Public Outreach Support Fees | | |
| Sandia National Labs Support | | |
| **Technical Document Review** | | |
| Project Management & Technical Support | | |
| Elevator Inspection (Allowance) | | |
| Materials Testing Support (Allowance) | | |
| Fire Protection Engineering Consultant (Allowance) | | |
| On-Site Construction Management | | |
| **Owner Management Contigencies** | | |
| Owners EIS Contingency | | |
| Owners Construction Contingency | | |
| Owners Design Contingency | | |
| Owners CA Services Contingency | | |
| Owners Commissioning Contingency | | |
| Owners FF&E Contingency | | |
| **Furniture, Fixtures & Equipment** | | |
| Moveable Scientific Equipment (Allowance) NIC | | |
| **Subtotal of Soft Costs** | | |
| **TOTAL PROJECT ESTIMATE** | | **$ 648,229,703** |

Table 2.3.7.C2 – Site Specific Project Budget Estimate Mississippi

d. (D) Butner, North Carolina:

**Butner, North Carolina - Site Specific Quantities and Costs**

| I | Facility Description | Quantities | | Unit Prices | Cost |
|---|---|---|---|---|---|
| | Main Research Building | 504,000 | gsf | | For Reference only |
| | cGMP | 13,000 | gsf | | For Reference only |
| | Gate House | 1,000 | gsf | | Reference only |
| | Central Receiving | 22,000 | gsf | | Reference only |
| | | | | | |
| **II Estimated Site Costs Summary** | | | | | |
| 1. Earthwork | Site cut, per Engineer | 244,235 | cy | | |
| | Site fill, per Engineer | 216,701 | cy | | |
| | Select fill | 0 | cy | | |
| | Haul off-site | 0 | cy | | |
| | Haul/site disperse | 27,534 | cy | | |
| | | | | | |
| | Basement cut | 35,491 | cy | | |
| | Basement backfill, select | 1,839 | cy | | |
| | Basement haul/site disperse | 37,330 | cy | | |
| | Basement haul/off-site | 0 | cy | | |
| 2. Roadways /Parking | Parking | 108,500 | sf | | |
| | Entry roadway | 45,950 | sf | | |
| | Entry roadway, curbs | 2,650 | lf | | |
| | Interior circulation roads and loading areas | 203,900 | sf | | |
| | Interior circulation roads and loading areas, curbs | 12,750 | lf | | |
| | Perimeter security drive | 131,550 | sf | | |
| | Perimeter security drive, curbs | 8,800 | lf | | |
| | Public highway paving | 0 | sf | | |
| | Connecting road to main highway | 162,000 | sf | | |
| | Connecting road to main highway, curbs | 8,200 | lf | | |
| | Entry walks | 22,100 | sf | | |
| 3. Fencing | Perimeter fence | 5,400 | lf | | |
| | Interior fence | 6,600 | lf | | |
| 4. Utility Distribution | Water (W) | 4,750 | lf | | |
| | Off-Site Water Upgrades (OW) | 0 | ls | | |
| | Gas (G) | 4,750 | lf | | |
| | Off-Site Gas Upgrades (OG) | 0 | ls | | |
| | Power (P) | 4,750 | lf | | |
| | Off-Site Power Upgrades (OP) | 3,400,000 | ls | | |
| | Relocate Overhead Power (P) | 0 | lf | | |
| | Sanitary (S) | 7,650 | lf | | |
| | Off-Site Sanitary Upgrades (OS) | 0 | ls | | |
| | Force main (FM), on-site | 0 | lf | | |
| | Force main (FM), off-site | 0 | lf | | |
| | Lift station | 0 | ea | | |
| | Sanitary manhole | 18 | ea | | |
| | Site lighting, per paved area | 651,900 | sf | | |
| 5. CUP | Central Utility Plant | 1 | ea | | |

Table 2.3.7.D1 – Site Specific Quantity and Cost Breakdown North Carolina

| PROJECT ESTIMATE SUMMARY - Butner, NC | | Project Costs |
|---|---|---|
| **CMc Pre-Construction/Construction** | | |
| **Buildings & Misc.** | | |
| Main Research Building & cGMP Cost | | |
| Gatehouse | | |
| Central Receiving | | |
| Security (Allowance) | | |
| IT (Allowance) | | |
| **Site Infrastructure & Utilities** | | |
| Central Utility Plant (Table 2.3.5.D1 - CUP) | | |
| Site Utilities (Table 2.3.7.D1 - Utility Distribution) | | |
| Sitework (Table 2.3.7.D1 - Earthwork, Roads/Parking, Fencing) | | |
| **Technology Systems** | | |
| Telephones & Equip (Allowance) | | |
| Preliminary Construction Estimate | | |
| Construction Estimate Escalated to 2008 | | |
| **Construction Estimate w/ Area Adjustment Factor** | | |
| Sustainable Design (Allowance) | | |
| CM Pre-Construction Fee | | |
| CM Construction Contingency | | |
| Escalation 2009 | | |
| Escalation 2010 | | |
| Escalation 2011 | | |
| Escalation 2012 | | |
| **Subtotal of Escalation, Sust Design, Pre-Const & Const Cont** | | |
| CMc Fee & General Conditions | | |
| Office Furniture (Allowance) 326 staff x $7,500/office | | |
| Signage (Allowance) | | |
| **Total Construction Costs** | | |
| **Architectural/Engineering Design Costs** | | |
| Design Phase Fee | | |
| Construction Administration Fee | | |
| **Commissioning** | | |
| **Planning/Project Development** | | |
| Environmental Impact Statement Contract | | |
| Conceptual Design & Feasibility Study | | |
| Site Characterization Study & Site Cost Analysis | | |
| Technical/Public Outreach Support Fees | | |
| Sandia National Labs Support | | |
| **Technical Document Review** | | |
| Project Management & Technical Support | | |
| Elevator Inspection (Allowance) | | |
| Materials Testing Support (Allowance) | | |
| Fire Protection Engineering Consultant (Allowance) | | |
| On-Site Construction Management | | |
| **Owner Management Contigencies** | | |
| Owners EIS Contingency | | |
| Owners Construction Contingency | | |
| Owners Design Contingency | | |
| Owners CA Services Contingency | | |
| Owners Commissioning Contingency | | |
| Owners FF&E Contingency | | |
| **Furniture, Fixtures & Equipment** | | |
| Moveable Scientific Equipment (Allowance) NIC | | |
| **Subtotal of Soft Costs** | | |
| **TOTAL PROJECT ESTIMATE** | **$** | **677,289,729** |

Table 2.3.7.D2 – Site Specific Project Budget Estimate North Carolina

e. (E) Plum Island, New York:

**Plum Island, New York - Site Specific Quantities and Costs**

| I | Facility Description | Quantities | | Unit Prices | Cost |
|---|---|---|---|---|---|
| | Main Research Building | 504,000 | gsf | | For Reference only |
| | cGMP | 13,000 | gsf | | For Reference only |
| | Gate House | 1,000 | gsf | | Reference only |
| | Central Receiving | 22,000 | gsf | | Reference only |
| | | | | | |
| **II Estimated Site Costs Summary** | | | | | |
| 1. Earthwork | Site cut, per Engineer | 264,544 | cy | | |
| | Site fill, per Engineer | 49,242 | cy | | |
| | Select fill | 0 | cy | | |
| | Haul off-site | 0 | cy | | |
| | Haul/site disperse | 215,302 | cy | | |
| | | | | | |
| | Basement cut | 74,661 | cy | | |
| | Basement backfill, select | 7,357 | cy | | |
| | Basement haul/site disperse | 82,018 | cy | | |
| | Basement haul/off-site | 0 | cy | | |
| 2. Roadways /Parking | Parking | 0 | sf | | |
| | Entry roadway | 0 | sf | | |
| | Entry roadway, curbs | 0 | lf | | |
| | Interior circulation roads and loading areas | 86,050 | sf | | |
| | Interior circulation roads and loading areas, curbs | 6,950 | lf | | |
| | Perimeter security drive | 0 | sf | | |
| | Perimeter security drive, curbs | 0 | lf | | |
| | Public highway paving | 0 | sf | | |
| | Connecting road to main highway | 0 | sf | | |
| | Connecting road to main highway, curbs | 0 | lf | | |
| | Entry walks | 4,350 | sf | | |
| 3. Fencing | Perimeter fence | 3,200 | lf | | |
| | Interior fence | | lf | | |
| 4. Utility Distribution | Water (W) | 1,400 | lf | | |
| | Gas (G) | 1,400 | lf | | |
| | Power (P) | 1,400 | lf | | |
| | Underwater cable (13 miles) | 68,650 | lf | | |
| | Relocate Overhead Power (P) | 0 | lf | | |
| | Sanitary (S) | 2,200 | lf | | |
| | Force main (FM), on-site | 1,000 | lf | | |
| | Force main (FM), off-site | 0 | lf | | |
| | Lift station | 1 | ea | | |
| | Sanitary manhole | 11 | ea | | |
| | New Waste Treatment Plant | 13,300 | sf | | |
| | Site lighting, per paved area | 86,050 | sf | | |
| 5. CUP | Central Utility Plant | 1 | ea | | |

Table 2.3.7.E1 – Site Specific Quantity and Cost Breakdown New York

| PROJECT ESTIMATE SUMMARY - Plum Island, NY | | Project Costs |
|---|---|---|
| **CMc Pre-Construction/Construction** | | |
| **Buildings & Misc.** | | |
| Main Research Building & cGMP Cost | | |
| Gatehouse (Will re-use existing island facility) | | |
| Grounds Equipment Storage (Will re-use existing island facility) | | |
| Central Receiving (Re-use existing facilities) | | |
| Security (Allowance) | | |
| IT (Allowance) | | |
| Re-use of approximately 11,585 SF of existing facilities (See section 2.3.1.e) | | |
| **Sitework, Site Infrastructure & Utilities** | | |
| Central Utility Plant (Table 2.3.5.E1 - CUP) | | |
| Site Utilities (Table 2.3.7.E1 - Utility Distribution) | | |
| Sitework (Table 2.3.7.E1 - Earthwork, Roads/Parking, Fencing) | | |
| **Technology Systems** | | |
| Telephones & Equip (Allowance) | | |
| Preliminary Construction Estimate | | |
| Construction Estimate Escalated to 2008 | | |
| **Construction Estimate w/ Area Adjustment Factor** | | |
| Sustainable Design (Allowance) | | |
| CM Pre-Construction Fee | | |
| CM Construction Contingency | | |
| Escalation 2009 | | |
| Escalation 2010 | | |
| Escalation 2011 | | |
| Escalation 2012 | | |
| **Subtotal of Escalation, Sust Design, Pre-Const & Const Cont** | | |
| CMc Fee & General Conditions | | |
| Office Furniture (Allowance) 326 staff x $7,500/office | | |
| Signage (Allowance) | | |
| **Total Construction Costs** | | |
| **Architectural/Engineering Design Costs** | | |
| Design Phase Fee | | |
| Construction Administration Fee | | |
| **Commissioning** | | |
| **Planning/Project Development** | | |
| Environmental Impact Statement Contract | | |
| Conceptual Design & Feasibility Study | | |
| Site Characterization Study & Site Cost Analysis | | |
| Technical/Public Outreach Support Fees | | |
| Sandia National Labs Support | | |
| **Technical Document Review** | | |
| Project Management & Technical Support | | |
| Elevator Inspection (Allowance) | | |
| Materials Testing Support (Allowance) | | |
| Fire Protection Engineering Consultant (Allowance) | | |
| On-Site Construction Management | | |
| **Owner Management Contigencies** | | |
| Owners EIS Contingency | | |
| Owners Construction Contingency | | |
| Owners Design Contingency | | |
| Owners CA Services Contingency | | |
| Owners Commissioning Contingency | | |
| Owners FF&E Contingency | | |
| **Furniture, Fixtures & Equipment** | | |
| Moveable Scientific Equipment (Allowance) NIC | $ | |
| **Subtotal of Soft Costs** | | |
| **TOTAL PROJECT ESTIMATE** | | **$ 939,326,684** |

Table 2.3.7.E2 – Site Specific Project Estimate Breakdown New York

f. (F) San Antonio, Texas:

**San Antonio, Texas - Site Specific Quantities and Costs**

| I | Facility Description | Quantities | | Unit Prices | Cost |
|---|---|---|---|---|---|
| | Main Research Building | 504,000 | gsf | | For Reference only |
| | cGMP | 13,000 | gsf | | For Reference only |
| | Gate House | 1,000 | gsf | | Reference only |
| | Central Receiving | 22,000 | gsf | | Reference only |
| | | | | | |
| **II Estimated Site Costs Summary** | | | | | |
| 1. Earthwork | Site cut, per Engineer | 324,900 | cy | | |
| | Site fill, per Engineer | 277,165 | cy | | |
| | Select fill | 0 | cy | | |
| | Haul off-site | 0 | cy | | |
| | Haul/site disperse | 47,735 | cy | | |
| | | | | | |
| | Basement cut | 164,036 | cy | | |
| | Basement backfill, select | 29,430 | cy | | |
| | Basement haul/site disperse | 193,466 | cy | | |
| | Basement haul/off-site | | cy | | |
| 2. Roadways /Parking | Parking | 112,900 | sf | | |
| | Entry roadway | 26,100 | sf | | |
| | Entry roadway, curbs | 1,500 | lf | | |
| | Interior circulation roads and loading areas | 183,400 | sf | | |
| | Interior circulation roads and loading areas, curbs | 11,750 | lf | | |
| | Perimeter security drive | 120,450 | sf | | |
| | Perimeter security drive, curbs | 88,550 | lf | | |
| | Public highway paving | 0 | sf | | |
| | Connecting road to main highway | 0 | sf | | |
| | Connecting road to main highway, curbs | 0 | lf | | |
| | Entry walks | 16,950 | sf | | |
| 3. Fencing | Perimeter fence | 6,250 | lf | | |
| | Interior fence | 6,600 | lf | | |
| 4. Utility Distribution | Water (W) | 1,200 | lf | | |
| | Off-Site Water Upgrades (OW) | 0 | ls | | |
| | Gas (G) | 2,250 | lf | | |
| | Off-Site Gas Upgrades (OG) | 0 | ls | | |
| | Power (P) | 1,200 | lf | | |
| | Off-Site Power Upgrades (OP) | 0 | ls | | |
| | Relocate Overhead Power (P) | 0 | lf | | |
| | Sanitary (S) | 4,000 | lf | | |
| | Off-Site Sanitary Upgrades (OS) | 0 | ls | | |
| | Force main (FM), on-site | 0 | lf | | |
| | Force main (FM), off-site | 0 | lf | | |
| | Lift station | 0 | ea | | |
| | Sanitary manhole | 19 | ea | | |
| | Site lighting, per paved area | 442,850 | sf | | |
| 5. CUP | Central Utility Plant | 1 | ea | | |

Table 2.3.7.F1 – Site Specific Quantity and Cost Breakdown Texas

| PROJECT ESTIMATE SUMMARY - San Antonio, TX | | Project Costs |
|---|---|---|
| **CMc Pre-Construction/Construction** | | |
| **Buildings & Misc.** | | |
| Main Research Building & cGMP Cost | | |
| Gatehouse | | |
| Central Receiving | | |
| Security (Allowance) | | |
| IT (Allowance) | | |
| **Site Infrastructure & Utilities** | | |
| Central Utility Plant (Table 2.3.5.F1 - CUP) | | |
| Site Utilities (Table 2.3.7.F1 - Utility Distribution) | | |
| Sitework (Table 2.3.7.F1 - Earthwork, Roads/Parking, Fencing) | | |
| **Technology Systems** | | |
| Telephones & Equip (Allowance) | | |
| Preliminary Construction Estimate | | |
| Construction Estimate Escalated to 2008 | | |
| **Construction Estimate w/ Area Adjustment Factor** | | |
| Sustainable Design (Allowance) | | |
| CM Pre-Construction Fee | | |
| CM Construction Contingency | | |
| Escalation 2009 | | |
| Escalation 2010 | | |
| Escalation 2011 | | |
| Escalation 2012 | | |
| **Subtotal of Escalation, Sust Design, Pre-Const & Const Cont** | | |
| CMc Fee & General Conditions | | |
| Office Furniture (Allowance) 326 staff x $7,500/office | | |
| Signage (Allowance) | | |
| **Total Construction Costs** | | |
| **Architectural/Engineering Design Costs** | | |
| Design Phase Fee | | |
| Construction Administration Fee | | |
| **Commissioning** | | |
| **Planning/Project Development** | | |
| Environmental Impact Statement Contract | | |
| Conceptual Design & Feasibility Study | | |
| Site Characterization Study & Site Cost Analysis | | |
| Technical/Public Outreach Support Fees | | |
| Sandia National Labs Support | | |
| **Technical Document Review** | | |
| Project Management & Technical Support | | |
| Elevator Inspection (Allowance) | | |
| Materials Testing Support (Allowance) | | |
| Fire Protection Engineering Consultant (Allowance) | | |
| On-Site Construction Management | | |
| **Owner Management Contigencies** | | |
| Owners EIS Contingency | | |
| Owners Construction Contingency | | |
| Owners Design Contingency | | |
| Owners CA Services Contingency | | |
| Owners Commissioning Contingency | | |
| Owners FF&E Contingency | | |
| **Furniture, Fixtures & Equipment** | | |
| Moveable Scientific Equipment (Allowance) NIC | | |
| **Subtotal of Soft Costs** | | |
| **TOTAL PROJECT ESTIMATE** | | **$ 652,377,478** |

Table 2.3.7.F2 – Site Specific Project Cost Breakdown Texas

Intentionally Left Blank

| Description | GA Costs | % Avg | KS Costs | % Avg | MS Costs | % Avg | NC Costs | % Avg | NY Costs | % Avg | TX Costs | % Avg | Avg Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sitework Costs** | | | | | | | | | | | | | |
| Site cut, per Engineer | | | | | | | | | | | | | |
| Site fill, per Engineer | | | | | | | | | | | | | |
| Select fill | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| Haul off-site | | | | | | | | | | | | | |
| Haul/site disperse | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| Basement cut | | | | | | | | | | | | | |
| Basement backfill, select | | | | | | | | | | | | | |
| Basement haul/site disperse | | | | | | | | | | | | | |
| Basement haul/off-site | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| Parking | | | | | | | | | | | | | |
| Entry roadway | | | | | | | | | | | | | |
| Entry roadway, curbs | | | | | | | | | | | | | |
| Interior circulation roads and loading areas | | | | | | | | | | | | | |
| Interior circulation roads and loading areas, curbs | | | | | | | | | | | | | |
| Perimeter security drive | | | | | | | | | | | | | |
| Perimeter security drive, curbs | | | | | | | | | | | | | |
| Public highway paving | | | | | | | | | | | | | |
| Connecting road to main highway | | | | | | | | | | | | | |
| Connecting road to main highway, curbs | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| Entry walks | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| Perimeter Security Fence | | | | | | | | | | | | | |
| Interior Security Fence | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| **Utility Costs** | | | | | | | | | | | | | |
| Water (W) | | | | | | | | | | | | | |
| Off-Site Water Upgrades (OW) | | | | | | | | | | | | | |
| Gas (G) | | | | | | | | | | | | | |
| Off-Site Gas Upgrades (OG) | | | | | | | | | | | | | |
| Power (P) | | | | | | | | | | | | | |
| Off-Site Power Upgrades (OP) | | | | | | | | | | | | | |
| Relocate Overhead Power (P) | | | | | | | | | | | | | |
| Underwater cable (13 miles) | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| Sanitary (S) | | | | | | | | | | | | | |
| Off-Site Sanitary Upgrades (OS) | | | | | | | | | | | | | |
| Force main (FM), on-site | | | | | | | | | | | | | |
| Force main (FM), off-site | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| Site lighting, per paved area | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| Lift station | | | | | | | | | | | | | |
| Sanitary manhole | | | | | | | | | | | | | |
| New Waste Treatment Plant | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| Central Utility Plant | | | | | | | | | | | | | |
| **Subtotal Site Construction Costs** | | | | | | | | | | | | | |

Table 2.3.7.S1 – Site Specific Construction Costs Comparison

| | Description | GA Costs | % Avg | KS Costs | % Avg | MS Costs | % Avg | NC Costs | % Avg | NY Costs | % Avg | TX Costs | % Avg | Avg Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Building Construction Costs** | | | | | | | | | | | | | |
| 3 | Cast in Place Concrete | [redacted] | | | | | | | | | | | | |
| | Structural grade level slab additional | | | | | | | | | | | | | |
| | Foundations, additional (20%) | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| 4 | Masonry | | | | | | | | | | | | | |
| 5 | Miscellaneous Metals & Structural Steel | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| 6 | General Trades | | | | | | | | | | | | | |
| 7 | Roofing & Waterproofing | | | | | | | | | | | | | |
| 8 | Doors, Windows and Openings | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| 9 | Drywall/ Acoustical/Finishes | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| 10 | Specialties | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| 11 | Casework & Fume Hoods, Lab Equipment | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| 12 | Furnishings | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| 13 | Environmental Room | | | | | | | | | | | | | |
| | Security Systems | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| 14 | Elevators & Conveying Systems | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| 15 | Mechanical (Includes Plumbing & Fire Protection) | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| 16 | Electrical & Communications | | | | | | | | | | | | | |
| | **Subtotal Building Construction Costs** | | | | | | | | | | | | | |
| | Area Adjustment Factor | | | | | | | | | | | | | |
| | **Total Site Specific Construction Costs** | | | | | | | | | | | | | |

Notes:
1. These totals do not include all the costs associated with the project budget but are intended to provide a comparison of the major costs that are effected by the site analysis.
2. These costs reflect 2007 dollars and have not been escalated further.

Table 2.3.7.S2 – Site Specific Construction Costs Comparison

## ENR Cost Indexes in 20 cities; 1978-2008 (20 Years)

| 1913=100 | | ATLANTA | | | | 1913=100 | | DALLAS | | | | 1913=100 | | KANSAS CITY | | | | 1913=100 | | NEW YORK | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | BCI | % | CCI | % | | | BCI | % Chg | CCI | % Chg | | | BCI | % Chg | CCI | % Chg | | | BCI | % Chg | CCI | % Chg |
| 1978 | Dec | 503.73 | 8.6 | 2172.6 | 8.9 | 1978 | Dec | 1555.83 | 9.6 | 2082.95 | 3.8 | 1978 | Dec | 1755.14 | 6 | 3039.64 | 5.1 | 1978 | Dec | 1875.62 | 2 | 3325.43 | 7.4 |
| 1979 | Dec | 1609.97 | 7.1 | 2358.43 | 8.6 | 1979 | Dec | 1742.55 | 12 | 2427.24 | 16.5 | 1979 | Dec | 1905.07 | 8.5 | 3256.47 | 7.1 | 1979 | Dec | 2091.82 | 11.5 | 3580.5 | 7.7 |
| 1980 | Dec | 1725.89 | 7.2 | 2535.72 | 7.5 | 1980 | Dec | 1913.38 | 9.8 | 2683.34 | 10.6 | 1980 | Dec | 2044.04 | 7.3 | 3551.83 | 9.1 | 1980 | Dec | 2188.06 | 4.6 | 3774.64 | 5.4 |
| 1981 | Dec | 1873.6 | 8.6 | 2801.31 | 10.5 | 1981 | Dec | 2093.85 | 9.4 | 2975.25 | 10.9 | 1981 | Dec | 2202.55 | 7.8 | 3838.22 | 8.1 | 1981 | Dec | 2434.62 | 11.3 | 4125.68 | 9.3 |
| 1982 | Dec | 2015.03 | 7.5 | 3034.47 | 8.3 | 1982 | Dec | 2188.09 | 4.5 | 3192.54 | 7.3 | 1982 | Dec | 2270.35 | 3.1 | 4069.74 | 6 | 1982 | Dec | 2603.28 | 6.9 | 4553.93 | 10.4 |
| 1983 | Dec | 1960.47 | -2.7 | 2909 | -4.1 | 1983 | Dec | 2275.59 | 4 | 3263.61 | 2.2 | 1983 | Dec | 2445.06 | 7.7 | 4199.38 | 3.2 | 1983 | Dec | 2792.67 | 7.3 | 4887.55 | 7.3 |
| 1984 | Dec | 1970 | 0.5 | 2898.53 | -0.4 | 1984 | Dec | 2188.94 | -3.8 | 2950.4 | -9.6 | 1984 | Dec | 2359.38 | -3.5 | 4200.58 | 0 | 1984 | Dec | 2983.27 | 6.8 | 5160.95 | 5.6 |
| 1985 | Dec | 1981.18 | 0.6 | 2909.71 | 0.4 | 1985 | Dec | 2100.7 | -4 | 2997.36 | 1.6 | 1985 | Dec | 2395.14 | 1.5 | 4337.4 | 3.3 | 1985 | Dec | 3076.19 | 3.1 | 5388.08 | 4.4 |
| 1986 | Dec | 2089.63 | 5.5 | 3018.67 | 3.7 | 1986 | Dec | 2131.57 | 1.5 | 3152.84 | 5.2 | 1986 | Dec | 2453.96 | 2.5 | 4485.48 | 3.4 | 1986 | Dec | 3217.83 | 4.6 | 5621.15 | 4.3 |
| 1987 | Dec | 2134.12 | 2.1 | 3094.92 | 2.5 | 1987 | Dec | 2123.18 | -0.4 | 2985.85 | -5.3 | 1987 | Dec | 2523.61 | 2.8 | 4599.98 | 2.6 | 1987 | Dec | 3369.28 | 4.7 | 5961.27 | 6.1 |
| 1988 | Dec | 2157.86 | 1.1 | 3107.63 | 0.4 | 1988 | Dec | 2066.89 | -2.7 | 3184.72 | 6.7 | 1988 | Dec | 2550.52 | 1.1 | 4667.26 | 1.5 | 1988 | Dec | 3522.07 | 4.5 | 6231.12 | 4.5 |
| 1989 | Dec | 2202.12 | 2.1 | 3141.55 | 1.1 | 1989 | Dec | 2117.91 | 2.5 | 3208.39 | 0.7 | 1989 | Dec | 2603.68 | 2.1 | 4719.9 | 1.1 | 1989 | Dec | 3712.2 | 5.4 | 6453.56 | 3.6 |
| 1990 | Dec | 2233.8 | 1.4 | 3191.55 | 1.6 | 1990 | Dec | 2066.12 | -2.5 | 3195.21 | -0.9 | 1990 | Dec | 2645.28 | 1.6 | 4763.94 | 0.9 | 1990 | Dec | 3847.21 | 3.6 | 6846.49 | 6.1 |
| 1991 | Dec | 2278.83 | 2 | 3224.67 | 1 | 1991 | Dec | 2215.88 | 7.3 | 3336.53 | 4.4 | 1991 | Dec | 2637.2 | -0.3 | 4762.18 | 0 | 1991 | Dec | 3997.91 | 3.9 | 7110.37 | 3.9 |
| 1992 | Dec | 2404.75 | 5.5 | 3348.42 | 3.8 | 1992 | Dec | 2278.21 | 2.8 | 3476.69 | 4.2 | 1992 | Dec | 2677.21 | 1.5 | 4955.79 | 4.1 | 1992 | Dec | 4151.28 | 3.8 | 7367.49 | 3.6 |
| 1993 | Dec | 2458.75 | 2.3 | 3389.89 | 1.2 | 1993 | Dec | 2365.65 | 3.8 | 3570.97 | 2.7 | 1993 | Dec | 2874.34 | 7.4 | 5224.43 | 5.4 | 1993 | Dec | 4349.2 | 4.8 | 7737.11 | 5 |
| 1994 | Dec | 2480.55 | 0.9 | 3430.97 | 1.2 | 1994 | Dec | 2448.62 | 3.5 | 3640.03 | 1.9 | 1994 | Dec | 2916.25 | 1.5 | 5304.63 | 1.5 | 1994 | Dec | 4458.36 | 2.5 | 8117.64 | 4.9 |
| 1995 | Dec | 2412.12 | -2.8 | 3381.41 | -1.4 | 1995 | Dec | 2433.04 | -0.6 | 3641.12 | 0 | 1995 | Dec | 2889.17 | -0.9 | 5369.96 | 1.2 | 1995 | Dec | 4557.44 | 2.2 | 8378.68 | 3.2 |
| 1996 | Dec | 2623.59 | 8.8 | 3601.31 | 6.5 | 1996 | Dec | 2596.4 | 6.7 | 3870.81 | 6.3 | 1996 | Dec | 3202.29 | 10.8 | 5652.65 | 5.3 | 1996 | Dec | 4774.23 | 4.8 | 8554.47 | 2.1 |
| 1997 | Dec | 2669.39 | 1.8 | 3690.27 | 2.5 | 1997 | Dec | 2662.34 | 2.5 | 3935.95 | 1.7 | 1997 | Dec | 3343.32 | 4.4 | 5909.18 | 4.5 | 1997 | Dec | 4880.61 | 2.2 | 8742.88 | 2.2 |
| 1998 | Dec | 2779.82 | 4.1 | 3772.43 | 2.2 | 1998 | Dec | 2681.91 | 0.7 | 3960.19 | 0.6 | 1998 | Dec | 3304.51 | -1.2 | 5981.26 | 1.2 | 1998 | Dec | 4890.13 | 0.2 | 8899.59 | 1.8 |
| 1999 | Dec | 2816.44 | 1.3 | 3849.39 | 2 | 1999 | Dec | 2691.36 | 0.4 | 3968.5 | 0.2 | 1999 | Dec | 3415.89 | 3.4 | 5999.65 | 0.3 | 1999 | Dec | 5147.21 | 5.3 | 9355.77 | 5.1 |
| 2000 | Dec | 2947.56 | 4.7 | 4105.86 | 6.7 | 2000 | Dec | 2742.46 | 1.9 | 3985.86 | 0.4 | 2000 | Dec | 3436.62 | 0.6 | 6221.07 | 3.7 | 2000 | Dec | 5018.67 | -2.5 | 9379.14 | 0.3 |
| 2001 | Dec | 2928.63 | -0.6 | 4045.52 | -1.5 | 2001 | Dec | 2677.52 | -2.4 | 3854.32 | -3.3 | 2001 | Dec | 3516.74 | 2.3 | 6477.21 | 4.1 | 2001 | Dec | 5330.03 | 6.2 | 10101.24 | 7.7 |
| 2002 | Dec | 2942.62 | 0.5 | 4189.12 | 3.6 | 2002 | Dec | 2684.31 | 0.3 | 3895.46 | 1.1 | 2002 | Dec | 3607.87 | 2.6 | 6782.21 | 4.7 | 2002 | Dec | 5438.2 | 2 | 10009.06 | -0.9 |
| 2003 | Dec | 3018.37 | 2.6 | 4374.69 | 4.4 | 2003 | Dec | 2809.42 | 4.7 | 4044.04 | 3.8 | 2003 | Dec | 3711.13 | 2.9 | 6971.96 | 2.8 | 2003 | Dec | 5583.09 | 2.7 | 10386.73 | 3.8 |
| 2004 | Dec | 3321.8 | 10.1 | 4611.31 | 5.4 | 2004 | Dec | 3062.28 | 9 | 4343.39 | 7.4 | 2004 | Dec | 4300.41 | 15.9 | 8019.84 | 15 | 2004 | Dec | 6112.26 | 9.5 | 11662.25 | 12.3 |
| 2005 | Jan | 3317.89 | 10 | 4607.39 | 5.4 | 2005 | Jan | 3056.16 | 8.9 | 4337.27 | 7.3 | 2005 | Jan | 4180.73 | 12.7 | 7900.16 | 13.4 | 2005 | Jan | 6193.86 | 8.7 | 11743.85 | 7.2 |
| | Feb | 3305.2 | 8.7 | 4594.71 | 4.5 | | Feb | 3055.66 | 7.9 | 4336.77 | 6.7 | | Feb | 4180.23 | 12 | 7899.66 | 13 | | Feb | 6179.22 | 7.1 | 11729.21 | 6.8 |
| | Mar | 3300.81 | 3.4 | 4590.31 | 7 | | Mar | 3053.66 | 6.2 | 4334.77 | 5.5 | | Mar | 4176.23 | 10.6 | 7897.66 | 12.2 | | Mar | 6154.37 | 6.2 | 11704.36 | 6.3 |
| | Apr | 3332.06 | 6.6 | 4621.56 | 3.1 | | Apr | 3093.62 | 6.1 | 4374.73 | 5.4 | | Apr | 4209.48 | 9.3 | 8048.91 | 13.2 | | Apr | 6179.09 | 5.3 | 11729.08 | 5.8 |
| | May | 3348.86 | 6.2 | 4638.37 | 2.8 | | May | 3093.62 | 4.9 | 4374.73 | 4.6 | | May | 4209.48 | 7.2 | 8048.91 | 12 | | May | 6230.38 | 4.9 | 11729.08 | 5.1 |
| | Jun | 3364.02 | 6.2 | 4653.52 | 2.8 | | Jun | 3115.72 | 5.1 | 4653.77 | 10.6 | | Jun | 4229.53 | 4.1 | 8059.16 | 10.1 | | Jun | 6235.19 | 4.7 | 11733.89 | 5 |
| | Jul | 3389 | 4.4 | 4678.5 | 1.7 | | Jul | 3123.37 | 5.2 | 4651.41 | 10.7 | | Jul | 4218.03 | 3.8 | 8047.66 | 9.9 | | Jul | 6169.29 | 3.3 | 11667.99 | 4.3 |
| | Aug | 3381.69 | 3.8 | 4671.2 | 1.2 | | Aug | 3111.59 | 4.4 | 4639.64 | 10.1 | | Aug | 4206.03 | 3.2 | 8035.66 | 1.3 | | Aug | 6188.06 | 5 | 11883.99 | 7 |
| | Sep | 3526.75 | 5.1 | 4757.45r | 2.4 | | Sep | 3133.80r | 3.3 | 4645.89r | 7.6 | | Sep | 4212.28 | 1.4 | 8041.91 | 0.4 | | Sep | 6194.31 | 0.9 | 11890.24 | 1.7 |
| | Oct | 3545.83 | 7.4 | 4776.53 | 4 | | Oct | 3122.99 | 2.7 | 4635.09 | 7.3 | | Oct | 4235.53 | 1.9 | 8065.16 | 0.7 | | Oct | 6239.32 | 2 | 11935.25 | 2.3 |
| | Nov | 3571.79 | 7.5 | 4802.49 | 4.1 | | Nov | 3156.85 | 3.1 | 4668.94 | 7.5 | | Nov | 4401.6 | 5.8 | 8097.66 | 1 | | Nov | 6281.61 | 2.8 | 11977.54 | 2.7 |
| | Dec | 3599.04 | 8.4 | 4829.74 | 4.7 | | Dec | 3185.62 | 4 | 4697.71 | 8.2 | | Dec | 4428.85 | 3 | 8124.91 | 1.3 | | Dec | 6304.51 | 3.2 | 12000.44 | 2.9 |

Table 2.4A – ENR Construction Cost Index

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## ENR Cost Indexes in 20 cities; 1978-2008 (20 Years)

| 1913=100 | | ATLANTA | | | | 1913=100 | | DALLAS | | | | 1913=100 | | KANSAS CITY | | | | 1913=100 | | NEW YORK | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | BCI | % | CCI | % | | | BCI | % Chg | CCI | % Chg | | | BCI | % Chg | CCI | % Chg | | | BCI | % Chg | CCI | % Chg |
| 2006 | Jan | 3605.04 | 8.7 | 4835.74 | 5 | 2006 | Jan | 3191.62 | 4.4 | 4703.71 | 8.5 | 2006 | Jan | 4434.85 | 6.1 | 8130.91 | 2.9 | 2006 | Jan | 6310.51 | 1.9 | 12006.44 | 2.2 |
| | Feb | 3598.87 | 8.9 | 4829.57 | 5.1 | | Feb | 3185.05 | 4.2 | 4697.14 | 8.3 | | Feb | 4432.85 | 6 | 8478.91 | 7.3 | | Feb | 6296.54 | 1.9 | 11992.47 | 2.2 |
| | Mar | 3592.87 | 8.9 | 4823.57 | 5.1 | | Mar | 3179.05 | 4.1 | 4691.14 | 8.2 | | Mar | 4426.85 | 6 | 8472.91 | 7.3 | | Mar | 6290.54 | 2.2 | 11986.47 | 2.4 |
| | Apr | 3597.61 | 8 | 4828.31 | 4.5 | | Apr | 3182.05 | 2.9 | 4694.14 | 7.3 | | Apr | 4429.85 | 5.2 | 8475.91 | 5.3 | | Apr | 6293.54 | 1.9 | 11989.47 | 2.2 |
| | May | 3582.01 | 7 | 4812.71 | 3.8 | | May | 3180.3 | 2.8 | 4692.39 | 7.3 | | May | 4441.63 | 5.5 | 8487.69 | 5.5 | | May | 6298.56 | 1.1 | 11994.49 | 2.3 |
| | Jun | 3589.76 | 6.7 | 4820.46 | 3.6 | | Jun | 3192.35 | 2.5 | 4740.44 | 1.3 | | Jun | 4449.38 | 5.2 | 8495.44 | 5.4 | | Jun | 6361.79 | 2 | 12057.73 | 2.8 |
| | Jul | 3602.55 | 6.3 | 4833.24 | 3.3 | | Jul | 3212.44 | 2.9 | 4724.53 | 1.6 | | Jul | 4465.88 | 5.9 | 8511.94 | 5.8 | | Jul | 6340.21 | 2.8 | 12036.15 | 3.2 |
| | Aug | 3612.05 | 6.8 | 4842.75 | 3.6 | | Aug | 3214.62 | 3.3 | 4726.71 | 1.9 | | Aug | 4472.88 | 6.3 | 8518.94 | 6 | | Aug | 6347.21 | 2.6 | 12043.15 | 1.3 |
| | Sep | 3629.66 | 2.9 | 4898.47 | 3 | | Sep | 3286.95 | 4.9 | 4888.08 | 5.2 | | Sep | 4475.13 | 6.2 | 8521.19 | 6 | | Sep | 6349.46 | 2.5 | 12045.4 | 1.3 |
| | Oct | 3647.72 | 2.9 | 4916.53 | 2.9 | | Oct | 3305.24 | 5.8 | 4906.37 | 5.9 | | Oct | 4449.11 | 5 | 8495.17 | 5.3 | | Oct | 6510.56 | 4.4 | 12378.9 | 3.7 |
| | Nov | 3649.58 | 2.2 | 4918.4 | 2.4 | | Nov | 3333.18 | 5.6 | 4934.31 | 5.7 | | Nov | 4774.26 | 8.5 | 8763.44 | 8.2 | | Nov | 6535.31 | 4 | 12403.65 | 3.6 |
| | Dec | 3624.54 | 0.7 | 4893.35 | 1.3 | | Dec | 3322.11 | 4.3 | 4922.24 | 4.8 | | Dec | 4715.49 | 6.5 | 8704.67 | 7.1 | | Dec | 6520.06 | 3.4 | 12388.4 | 3.2 |
| 2007 | Jan | 3611.98 | 0.2 | 4880.79 | 0.9 | 2007 | Jan | 3311.52 | 3.8 | 4912.65 | 4.4 | 2007 | Jan | 4708.99 | 6.2 | 8698.17 | 7 | 2007 | Jan | 6513.56 | 3.2 | 12381.9 | 3.1 |
| | Feb | 3605.25 | 0.2 | 4874.06 | 0.9 | | Feb | 3313 | 4 | 4914.13 | 4.6 | | Feb | 4708.49 | 6.2 | 8697.67 | 2.6 | | Feb | 6513.06 | 3.4 | 12381.4 | 3.2 |
| | Mar | 3601.76 | 0.3 | 4870.58 | 1 | | Mar | 3315.5 | 4.3 | 4916.63 | 4.8 | | Mar | 4710.99 | 6.4 | 8700.17 | 2.7 | | Mar | 6515.56 | 3.6 | 12383.9 | 3.3 |
| | Apr | 3602.12 | 0.1 | 4870.93 | 0.9 | | Apr | 3319.13 | 4.3 | 4920.26 | 4.8 | | Apr | 4713.74 | 6.4 | 8702.92 | 2.7 | | Apr | 6553.28 | 4.1 | 12421.62 | 3.6 |
| | May | 3632.06 | 1.4 | 5265.79 | 9.4 | | May | 3506.96 | 10.3 | 5001.58 | 6.6 | | May | 4784.94 | 7.7 | 8760.44 | 3.2 | | May | 6567.28 | 4.3 | 12435.62 | 3.7 |
| | Jun | 3631.21 | 1.2 | 5264.94 | 9.2 | | Jun | 3513.95 | 10.1 | 5008.56 | 6.5 | | Jun | 4742.42 | 6.6 | 8717.92 | 2.6 | | Jun | 6568.28 | 3.3 | 12436.62 | 3.1 |
| | Jul | 3636.84 | 1 | 5270.57 | 9.1 | | Jul | 3485.74 | 8.5 | 4980.35 | 5.4 | | Jul | 4748.92 | 6.3 | 8724.42 | 2.5 | | Jul | 6574.78 | 3.7 | 12443.12 | 3.4 |
| | Aug | 3643.07 | 1.1 | 5276.79 | 9.1 | | Aug | 3487.74 | 8.7 | 4982.35 | 5.6 | | Aug | 4704.41 | 5.3 | 8679.92 | 2 | | Aug | 6576.78 | 3.7 | 12445.12 | 3.4 |
| | Sep | 3633.71 | 0.1 | 5267.43 | 7.5 | | Sep | 3481.13 | 5.9 | 4975.75 | 1.8 | | Sep | 4704.66 | 5.1 | 8680.17 | 1.9 | | Sep | 6577.03 | 3.6 | 12445.37 | 3.3 |
| | Oct | 3635.43 | –0.3 | 5269.15 | 7.2 | | Oct | 3485.72 | 5.5 | 4980.34 | 1.5 | | Oct | 4705.66 | 5.8 | 8681.17 | 2.2 | | Oct | 6578.03 | 1 | 12446.37 | 0.6 |
| | Nov | 3628.91 | -0.6 | 5262.63 | 7 | | Nov | 3476.72 | 4.3 | 4971.34 | 0.8 | | Nov | 4778.49 | 0.1 | 8972.17 | 2.4 | | Nov | 6569.03 | 0.5 | 12437.37 | 0.3 |
| | Dec | 3624.54 | 0.7 | 5259.37 | 7.5 | | Dec | 3477.24 | 4.7 | 4971.86 | 1 | | Dec | 4780.99 | 1.4 | 8974.67 | 3.1 | | Dec | 6571.53 | 0.8 | 12439.87 | 0.4 |
| 2008 | Jan | 3621.32 | 0.3 | 5255.05 | 7.7 | 2008 | Jan | 3478.37 | 5 | 4972.98 | 1.2 | 2008 | Jan | 4782.74 | 1.6 | 8976.42 | 3.2 | 2008 | Jan | 6573.28 | 0.9 | 12441.62 | 0.5 |
| | Feb | 3620.29 | 0.4 | 5254.01 | 7.8 | | Feb | 3478.37 | 5 | 4972.98 | 1.2 | | Feb | 4782.74 | 1.6 | 8976.42 | 3.2 | | Feb | 6573.28 | 0.9 | 12441.62 | 0.5 |
| | Mar | 3634.13 | 0.9 | 5267.86 | 8.2 | | Mar | 3495.89 | 5.4 | 4990.51 | 1.5 | | Mar | 4798.74 | 1.9 | 8992.42 | 3.4 | | Mar | 6589.28 | 1.1 | 12457.62 | 0.6 |
| | Apr | 3638.1 | 1 | 5271.83 | 8.2 | | Apr | 3491.11 | 5.2 | 4985.72 | 1.3 | | Apr | 4858.14 | 3.1 | 9051.82 | 4 | | Apr | 6594.28 | 0.6 | 12462.62 | 0.3 |
| | May | 3657.22 | 0.7 | 5290.95 | 0.5 | | May | 3510.78 | 0.1 | 5005.4 | 0.1 | | May | 5046.97 | 5.5 | 9303.07 | 6.2 | | May | 6613.53 | 0.7 | 12481.87 | 0.4 |
| Inflation 1978 thru 2008 (20 yr) | | 3.69 | | 4.06 | | | | | 4.19 | | 4.29 | | | | 4.76 | | 4.72 | | | | 3.65 | | 3.80 |
| Inflation 1998 thru 2008 (10 yr) | | 3.82 | | 4.42 | | | | | 4.57 | | 4.60 | | | | 5.23 | | 5.15 | | | | 3.08 | | 3.15 |
| Inflation 2003 thru 2008 (5 yr) | | 4.03 | | 4.63 | | | | | 5.08 | | 5.16 | | | | 5.66 | | 5.43 | | | | 3.17 | | 3.19 |
| Average of recent 5 year inflation | | | | 4.33 | | | | | | | 5.12 | | | | | | 5.54 | | | | | | 3.18 |

Table 2.4B – ENR Construction Cost Index (Cont.)

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# Section 3: Operations & Maintenance Costs

## 3.1. INTRODUCTION

### 3.1.1. Operations & Maintenance Costs

This section will evaluate the costs associated with the maintenance, utilities and salaries related with the NBAF program. As the NBAF program is at a very conceptual stage, costs will be developed from other similar programs that are in current operation, have recently been constructed or are currently under construction as benchmark facilities. Reference to the specific projects will be provided to support the findings presented in this analysis.

The operational cost will be calculated on a fiscal year basis starting with the first intended year of occupancy (2014) and be projected over an eight year period with escalation applied. This analysis will include all salary, contracts, supply/materials, administrative and utility costs associated with facility operation and the maintenance or minor repair of building systems and equipment and grounds and security costs. These O&M costs have been estimated by using the Canadian Science Centre for Human and Animal Health (CSCHAH) in Winnipeg Canada operational cost report and applying the necessary escalation factors for both calendar year and project size.
These operational costs have been broken down into the following categories:

- Systems Maintenance – This includes all maintenance related costs, both material and or contract costs, to support the NBAF facility.
- Utility Costs – This includes the anticipated utility consumption based on this preliminary program. These costs were determined by using site specific climate data at each site.
- Salaries – This includes all salaries related to the personnel that will be working within or supporting the NBAF facilities.

All costs associated with client-requested laboratory fit- ups would be absorbed by the client at the time of request and are generally not represented in normal facility operation costs, with the exception of expenditure of time by operations, maintenance, and technical staff. For this reason, the percentage of time allotted to client-requested laboratory fit-up activities has been equated to a portion of certain technical staff's salaries and omitted from this study.

Costs do not account for any additional construction, renovation or revitalization of the NBAF facility once constructed. Should such activities be required these costs would be in addition to the O&M costs provided in this analysis.

## 3.2. MAINTENANCE COSTS

Systems and maintenance costs are based on the actual operations & maintenance report provided for the Canadian Science for Human and Animal Health Laboratory in Winnipeg Canada (CSCHAH). This report will provide estimated operations and maintenance costs for each individual major building system as well as summary tables of this information. All of these costs have been estimated over an eight year period from 2014 through 2022. These costs have been adjusted to conform to the NBAF project parameters for currency rates, rate of inflation and size of facility. As the NBAF program is considerably larger than the CSCHAH, these costs have been increased by a factor of 73%.

Base Estimate & Summary O&M System Costs - Table 3.2A summarizes the anticipated maintenance costs and includes an annual average cost for each system to be used in further analysis of costs.

| Systems Maintenance and O&M Categories | 2014/2015 | 2015/2016 | 2016/2017 | 2017/2018 | 2018/2019 | 2019/2020 | 2020/2021 | 2021/2022 | Average |
|---|---|---|---|---|---|---|---|---|---|
| Facility Security System Costs | | | | | | | | | |
| Grounds & Cleaning | | | | | | | | | |
| Facility Administrative Costs | | | | | | | | | |
| Miscellaneous O&M Staffing Costs | | | | | | | | | |
| Fire and Life Safety System | | | | | | | | | |
| Soft Water Production Costs | | | | | | | | | |
| Hard Water Usage and Costs | | | | | | | | | |
| Steam System | | | | | | | | | |
| Chilled Water System | | | | | | | | | |
| Air Handling System | | | | | | | | | |
| Biowaste Treatment System | | | | | | | | | |
| Renderer | | | | | | | | | |
| Breathing Air System | | | | | | | | | |
| Chemical Showers | | | | | | | | | |
| HEPA Filtration System | | | | | | | | | |
| Liquid Nitrogen System | | | | | | | | | |
| Biosafety Cabinets & Fumehoods | | | | | | | | | |
| Autoclaves | | | | | | | | | |
| UPS | | | | | | | | | |
| RO Water System | | | | | | | | | |
| Additional Electrical System | | | | | | | | | |
| Additional Water & Sewer System | | | | | | | | | |
| Subtotals with Currency and Escalation | | | | | | | | | |
| Total O&M Costs with Square Footage Adj | | | | | | | | | |

Notes:
1. Systems and maintenance costs are based on the Operations & Maintenance report provided for the Canadian Science Centre for Human and Animal Health Laboratory in Winnipeg, CSCHAH.
2. The costs indicated above begin at completion of construction of NBAF and extend over an eight year period.
3. The costs indicated above have been adjusted from Canadian currency rates to U.S.
4. The costs indicated above have been escalated at 4% annually over a 16-year period from 1998 to 2014 dollars as the base line for this analysis.
5. The cost totals indicated above have been increased by an additional 73% to accommodate for the additional square footage between the CSCHAH and NBAF programs.
6. Below is the area tabulation and conversion chart between the NBAF and CSCHAH.

| Area Conversion Chart CSCHAH & NBAF | CSCHAH - GSM | CSCHAH - GSF | NBAF - GSF | % Increase |
|---|---|---|---|---|
| Net Area Totals | 12,206 | 131,390 | 181,314 | 38% |
| Gross Area Totals | 27,915 | 300,475 | 519,967 | 73% |

**Table 3.2A – Table of Estimated Annual Maintenance Costs**

Summary Estimate of Site Specific O&M Annual Costs - Table 3.2B represents the estimated O&M costs summarized and adjusted per site over an eight year period, 2014 – 2022 for comparison purposes.

| Year | Base Costs | GA | KS | MS | NC | NY | TX |
|---|---|---|---|---|---|---|---|
| 2014/2015 | | | | | | | |
| 2015/2016 | | | | | | | |
| 2016/2017 | | | | | | | |
| 2017/2018 | | | | | | | |
| 2018/2019 | | | | | | | |
| 2019/2020 | | | | | | | |
| 2020/2021 | | | | | | | |
| 2021/2022 | | | | | | | |
| Average | | | | | | | |

**Table 3.2B – Summary Table of Site Specific Maintenance Costs**

3.2.1 Security System Estimate - Security costs have been estimated according to two categories: expenditures representing typical security costs for a non-laboratory facility comparable in size and population to the NBAF, and expenditures necessitated by the laboratory activities specific to the NBAF. Table 3.2.1 provides the breakdown of the estimated security system O&M costs.

| Facility Security Costs | 2014/2015 | 2015/2016 | 2016/2017 | 2017/2018 | 2018/2019 | 2019/2020 | 2020/2021 | 2021/2022 | Average | %** |
|---|---|---|---|---|---|---|---|---|---|---|
| Fencing and Gates | | | | | | | | | | |
| Commissionaire | | | | | | | | | | |
| Membership Fees | | | | | | | | | | |
| Miscellaneous Cards | | | | | | | | | | |
| Lenel Control System Maintenance | | | | | | | | | | |
| Security - Other Expenses | | | | | | | | | | |
| CCTV Camera Repairs | | | | | | | | | | |
| | | | | | | | | | | |
| Total | | | | | | | | | | |

Note: Chart above does not reflect the costs associated with the square footage adjustment. See table A3.2 for total costs.
** Note: % Taken from Total Average

**Table 3.2.1 Facility Security Costs**

3.2.2 Cleaning and Grounds Maintenance Estimate - Table 3.2.2 provides the breakdown of the estimated general cleaning and grounds maintenance O&M costs.

| Facility Grounds Maintenance and Cleaning Costs | 2014/2015 | 2015/2016 | 2016/2017 | 2017/2018 | 2018/2019 | 2019/2020 | 2020/2021 | 2021/2022 | Average | %** |
|---|---|---|---|---|---|---|---|---|---|---|
| Cleaning of Furnishings | | | | | | | | | | |
| Cleaning Contracts | | | | | | | | | | |
| Window and Building Cleaning | | | | | | | | | | |
| Cleaning Supplies and Materials | | | | | | | | | | |
| Laundry / Dry Cleaning (Uniforms) | | | | | | | | | | |
| Misc. Products (Mats, etc.) | | | | | | | | | | |
| Trash Removal Contracts | | | | | | | | | | |
| Hazardous Waste Removal | | | | | | | | | | |
| Snow Removal (If Applicable) | | | | | | | | | | |
| Grounds Upkeep | | | | | | | | | | |
| Misc. Hardware | | | | | | | | | | |
| Flags and Decorations | | | | | | | | | | |
| Interior Horticulture | | | | | | | | | | |
| Chemicals and Related Products | | | | | | | | | | |
| Parking Lot / Exterior Lighting | | | | | | | | | | |
| Roads / Parking | | | | | | | | | | |
| | | | | | | | | | | |
| Total | | | | | | | | | | |

Note: Chart above does not reflect the costs associated with the square footage adjustment. See table A3.2 for total costs.

**Table 3.2.2 Facility Grounds Maintenance & Cleaning Costs**

3.2.3 Administration O&M Estimate - A breakdown of administrative and miscellaneous building costs is provided in Tables 3.2.3a & 3.2.3b. Similar to security expenditures, the laboratory spaces are assumed to account for a greater proportion of administrative costs because their function necessitates a greater amount of scheduling, planning, and staff management than would normal office spaces. Table 3.2.3a provides a complete listing of all typical administrative estimated O&M costs and table 3.2.3b provides all other miscellaneous administrative estimated O&M costs.

| Facility Administrative Costs | 2014/2015 | 2015/2016 | 2016/2017 | 2017/2018 | 2018/2019 | 2019/2020 | 2020/2021 | 2021/2022 | Average | %** |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
| Travel & Living Expenses | [redacted] | | | | | | | | | |
| Management Fee | | | | | | | | | | |
| Project Management Fee | | | | | | | | | | |
| Training | | | | | | | | | | |
| Travel | | | | | | | | | | |
| Apartment Rental | | | | | | | | | | |
| Employee Relocation | | | | | | | | | | |
| Transportation of Items | | | | | | | | | | |
| Courier Services | | | | | | | | | | |
| Contracted IT Services | | | | | | | | | | |
| Cells and Pagers Rental | | | | | | | | | | |
| Printing Services | | | | | | | | | | |
| Audio, Film, & Visual Service | | | | | | | | | | |
| Purchase of Licenses | | | | | | | | | | |
| Photo Services | | | | | | | | | | |
| Non Profesional Services | | | | | | | | | | |
| Health Service | | | | | | | | | | |
| Desk Support and LAN Service | | | | | | | | | | |
| Rental Other Office Machines | | | | | | | | | | |
| Stationary and Office Supplies | | | | | | | | | | |
| Photographic Film and Developing | | | | | | | | | | |
| Telecommunication Small Equipment | | | | | | | | | | |
| Pager and Basic Phones - Purchase | | | | | | | | | | |
| Information Technology Equipment | | | | | | | | | | |
| Software Licenses | | | | | | | | | | |
| Info Technology Books / Subscriptions | | | | | | | | | | |
| Program Administrative Services | | | | | | | | | | |
| Furniture and fixture Purchase | | | | | | | | | | |
| Permits and Memberships | | | | | | | | | | |
| Misc. Office Supplies / Services | | | | | | | | | | |
| Elevator Maintenance Contract | | | | | | | | | | |
| Elevator / Pressure Vessel Registration | | | | | | | | | | |
| Structural / Roof Inspections & Repairs | | | | | | | | | | |
| First Aid Supplies | | | | | | | | | | |
| Temporary Help Services | | | | | | | | | | |
| Pest Control | | | | | | | | | | |
| Wood Lumber | | | | | | | | | | |
| Bottled Drinking Water | | | | | | | | | | |
| Uniforms | | | | | | | | | | |
| Door Handle Lock Repair | | | | | | | | | | |
| Major Shutdown | | | | | | | | | | |
| Painting | | | | | | | | | | |
| Door Repairs | | | | | | | | | | |
| Carpentry | | | | | | | | | | |
| Flooring | | | | | | | | | | |
| Epoxy Repairs | | | | | | | | | | |
| Walk Thru's | | | | | | | | | | |
| Software Maintenance | | | | | | | | | | |
| Materials and Replacement Parts | | | | | | | | | | |
| Office Repairs < 5K | | | | | | | | | | |
| Decontamination Equipment & Materials | | | | | | | | | | |
| VHP Equipment & Materials* | | | | | | | | | | |
| Instrumentation - Calibration / Repair* | | | | | | | | | | |
| Laboratory Repairs* | | | | | | | | | | |
| Bioseal Door Repairs* | | | | | | | | | | |
| | | | | | | | | | | |
| Total | | | | | | | | | | |

Note: Chart above does not reflect the costs associated with the square footage adjustment. See table A3.2 for total costs.
*BSL 3ag and BSL 4 Only

**Table 3.2.3a Facility Administrative Costs**

| Miscellaneous O&M Staffing Costs | 2014/2015 | 2015/2016 | 2016/2017 | 2017/2018 | 2018/2019 | 2019/2020 | 2020/2021 | 2021/2022 | Average | %** |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
| Travel | [redacted] | | | | | | | | | |
| Planned Overtime | | | | | | | | | | |
| Tech Stand by | | | | | | | | | | |
| Stat Pay | | | | | | | | | | |
| Stand by Pay | | | | | | | | | | |
| Engineering Services | | | | | | | | | | |
| CADD / IT Support | | | | | | | | | | |
| CADD Operator | | | | | | | | | | |
| As-Built Field Person | | | | | | | | | | |
| Controls Assistant | | | | | | | | | | |
| Misc. Hardware | | | | | | | | | | |
| Materials & Supplies | | | | | | | | | | |
| Tools < 1K | | | | | | | | | | |
| Signage | | | | | | | | | | |
| Instrument Calibration | | | | | | | | | | |
| Rental Equipment | | | | | | | | | | |
| Contracted Services | | | | | | | | | | |
| Unfunded Client Work (Goodwill) | | | | | | | | | | |
| | | | | | | | | | | |
| Total | | | | | | | | | | |

Note: Chart above does not reflect the costs associated with the square footage adjustment. See table A3.2 for total costs.

**Table 3.2.3b Miscellaneous O&M Staffing Costs**

3.2.4 Fire and Life Safety Estimate - Table 3.2.4 provides the breakdown of the estimated fire protection and life safety systems O&M costs.

| Fire and Life Safety Costs | 2014/2015 | 2015/2016 | 2016/2017 | 2017/2018 | 2018/2019 | 2019/2020 | 2020/2021 | 2021/2022 | Average | %** |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
| Sprinkler Maintenance | [redacted] | | | | | | | | | |
| Generator Sets | | | | | | | | | | |
| Fire Protection O&M | | | | | | | | | | |
| Fire Alarm Service Contract | | | | | | | | | | |
| Fire Alarm Upgrade | | | | | | | | | | |
| Back Flow Preventers | | | | | | | | | | |
| Safety and Protection Equipment | | | | | | | | | | |
| Intercom / Biohazard Alarm System | | | | | | | | | | |
| Eyewash Stations / Emergency Showers | | | | | | | | | | |
| Fire Dampers | | | | | | | | | | |
| Misc. Manufactured Articles | | | | | | | | | | |
| | | | | | | | | | | |
| Total | | | | | | | | | | |

Note: Chart above does not reflect the costs associated with the square footage adjustment. See table A3.2 for total costs.

**Table 3.2.4 Fire & Life Safety Costs**

3.2.5 Soft Water Estimate - Total facility soft water consumption is divided amongst the following systems: humidification, boiler make-up, reverse osmosis water, autoclaves, process water and chemical showers. Table 3.2.5 provides the breakdown of the estimated soft water usage system O&M costs.

| Soft Water Production Costs | 2014/2015 | 2015/2016 | 2016/2017 | 2017/2018 | 2018/2019 | 2019/2020 | 2020/2021 | 2021/2022 | Average | % ** |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
| Water Costs | [redacted] | | | | | | | | | |
| Salt Costs | | | | | | | | | | |
| | | | | | | | | | | |
| Total | | | | | | | | | | |

Note: Chart above does not reflect the costs associated with the square footage adjustment. See table A3.2 for total costs.

**Table 3.2.5 Soft Water Production Costs**

3.2.6 Hard Water - Total facility hard water consumption is divided between cooling tower make-up and potable water. The total amount of hard water consumed is taken as the remainder of water not processed through the softener. Table 3.2.6 provides the breakdown of the estimated hard water usage system O&M costs.

| Hard Water Usage and Cost by System | 2014/2015 | 2015/2016 | 2016/2017 | 2017/2018 | 2018/2019 | 2019/2020 | 2020/2021 | 2021/2022 | Average | %** |
|---|---|---|---|---|---|---|---|---|---|---|
| Cooling Towers | [redacted] | | | | | | | | | |
| Potable Hot | | | | | | | | | | |
| Potable Cold | | | | | | | | | | |
| Total | | | | | | | | | | |

Note: Chart above does not reflect the costs associated with the square footage adjustment. See table A3.2 for total costs.

**Table 3.2.6 Hard Water Usage & Cost by System**

3.2.7 Steam Production - The steam production system includes boilers, feed water loops, and all integral equipment such as pumps and motors. The most significant cost associated with this system is natural gas consumption, which is assumed to be 99.5% of total facility consumption. Other costs are soft water used for make-up, boiler chemicals, O&M, and electricity used by boiler motors. Table 3.2.7 shows the costs of steam production on a per pound basis by fiscal year.

Relative steam use by each system has been estimated based on facility data for rendering and biowaste treatment, autoclaves, humidification, and domestic water. The remainder has been attributed to forced flow systems. Table 3.2.7 provides the breakdown of the estimated steam production system O&M costs.

| Steam System Cost Summary | 2014/2015 | 2015/2016 | 2016/2017 | 2017/2018 | 2018/2019 | 2019/2020 | 2020/2021 | 2021/2022 | Average | %** |
|---|---|---|---|---|---|---|---|---|---|---|
| Soft Water | [redacted] | | | | | | | | | |
| Chemicals | | | | | | | | | | |
| Steam System Maintenance | | | | | | | | | | |
| O&M | | | | | | | | | | |
| Misc. Manufactured Items *** | | | | | | | | | | |
| Energy Centre Maintenance Costs **** | | | | | | | | | | |
| Rental Machinery * | | | | | | | | | | |
| Tools < $1,000 * | | | | | | | | | | |
| Mach. And Replacement Parts * | | | | | | | | | | |
| Total | | | | | | | | | | |

Note: Chart above does not reflect the costs associated with the square footage adjustment. See table A3.2 for total costs.

| | |
|---|---|
| These Costs Divided Equally Between Steam System and Chilled Water System | * |
| Based on Feedwater Temp = 226F (Q=190BTU) and P steam = 100psi (Q=1190 BTUH & Boiler Effeciency | ** |
| Three Costs Divided Equally Between Steam System, Chilled Water System and HVAC System | *** |
| Included EC Costs for Compressed Air, Tools, and Stock Items | **** |

**Table 3.2.7 Steam System Cost Summary**

3.2.8 Chilled Water – This analyzes the costs for chilled water service contracts, chilled water system maintenance, process cooling, O&M, misc. manufactured items, rental of machinery, tools, and machine / replacement parts. Table 3.2.8 provides the breakdown of the estimated chilled water system O&M costs.

| Chiller Cost Summary | 2014/2015 | 2015/2016 | 2016/2017 | 2017/2018 | 2018/2019 | 2019/2020 | 2020/2021 | 2021/2022 | Average | %** |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
| Service Contract | [redacted] | | | | | | | | | |
| Chilled Water System Maintenance | | | | | | | | | | |
| Process Cooling | | | | | | | | | | |
| O&M | | | | | | | | | | |
| Misc. Manufactured Items ** | | | | | | | | | | |
| Rental Machinery * | | | | | | | | | | |
| Tools < $1,000 * | | | | | | | | | | |
| Mach. And Replacement Parts * | | | | | | | | | | |
| | | | | | | | | | | |
| Total | | | | | | | | | | |

Note: Chart above does not reflect the costs associated with the square footage adjustment. See table A3.2 for total costs.
These Costs Divided Equally Between Steam System and Chilled Water System *
Three Costs Divided Equally Between Steam System, Chilled Water System and HVAC System **

**Table 3.2.8 Chiller Cost Summary**

3.2.9 Air Handling Equipment - Aside from general operation and maintenance, the major costs associated with the air handling equipment are those incurred through environmental conditioning and bulk air movement. Conditioning costs are represented by steam consumption for heating and humidification, as well as electrical costs associated with the chiller for cooling. Air movement costs are represented by electricity consumption at fan motors. Table 3.2.9 provides the breakdown of the estimated air handling system O&M costs.

| Air System Cost Summary | 2014/2015 | 2015/2016 | 2016/2017 | 2017/2018 | 2018/2019 | 2019/2020 | 2020/2021 | 2021/2022 | Average | %** |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
| HVAC Service Contracts | [redacted] | | | | | | | | | |
| Controls Contracts | | | | | | | | | | |
| Air Balancer | | | | | | | | | | |
| Ductwork and Fan Maintenance | | | | | | | | | | |
| Air Handling Filters | | | | | | | | | | |
| HVAC - Humidification | | | | | | | | | | |
| HVAC Glycol Heating System | | | | | | | | | | |
| HVAC Misc. Items | | | | | | | | | | |
| O&M | | | | | | | | | | |
| | | | | | | | | | | |
| Total | | | | | | | | | | |

Note: Chart above does not reflect the costs associated with the square footage adjustment. See table A3.2 for total costs.
Includes Electricity, Service Contracts, and O&M *

**Table 3.2.9 Air System Cost Summary**

3.2.10 Biowaste Cook Tanks - Table 3.2.10 provides the breakdown of the estimated biowaste cook tank system O&M costs.

| Biowaste Treatment System | 2014/2015 | 2015/2016 | 2016/2017 | 2017/2018 | 2018/2019 | 2019/2020 | 2020/2021 | 2021/2022 | Average | %** |
|---|---|---|---|---|---|---|---|---|---|---|
| Cook Tank Cycles and Consumption | | | | | | | | | | |
| System Maintenance | [redacted] | | | | | | | | | |
| Effluent Testing ** | | | | | | | | | | |
| O&M ** | | | | | | | | | | |
| | | | | | | | | | | |
| Total | | | | | | | | | | |

Note: Chart above does not reflect the costs associated with the square footage adjustment. See table A3.2 for total costs.
85% attributed to Cook Tanks, 15 % to Rendering Tanks **

**Table 3.2.10 Biowaste Treatment System**

3.2.11 Renderer - Table 3.2.11 provides the breakdown of the estimated renderer system O&M costs.

| Renderer Cycles and Consumption | 2014/2015 | 2015/2016 | 2016/2017 | 2017/2018 | 2018/2019 | 2019/2020 | 2020/2021 | 2021/2022 | Average | %** |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
| Effluent Testing *** | [redacted] | | | | | | | | | |
| O&M *** | | | | | | | | | | |
| | | | | | | | | | | |
| Total | | | | | | | | | | |

Note: Chart above does not reflect the costs associated with the square footage adjustment. See table A3.2 for total costs.
Assuming 1 hr Motor Cycle ***

**Table 3.2.11 Renderer Cycles and Consumption**

3.2.12 Breathing Air System - Table 3.2.12 provides the breakdown of the estimated breathing air system O&M costs.

| Breathing Air System Costs | 2014/2015 | 2015/2016 | 2016/2017 | 2017/2018 | 2018/2019 | 2019/2020 | 2020/2021 | 2021/2022 | Average | %** |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
| Maint. Contract and Supplies | [redacted] | | | | | | | | | |
| O&M Costs | | | | | | | | | | |
| | | | | | | | | | | |
| Total | | | | | | | | | | |

Note: Chart above does not reflect the costs associated with the square footage adjustment. See table A3.2 for total costs.

**Table 3.2.12 Breathing Air System**

3.2.13 Chemical Shower - The number of showers per year was calculated based on the number of drums of Microchem purchased in those years; for all other fiscal years the number of chemical showers taken has been assumed from lab occupancy water use per shower based on a wash cycle of 88L and rinse cycle of 83.4L. Table 3.2.13 provides the breakdown of the estimated chemical shower system O&M costs.

| Chemical Shower Cost Summary | 2014/2015 | 2015/2016 | 2016/2017 | 2017/2018 | 2018/2019 | 2019/2020 | 2020/2021 | 2021/2022 | Average | %** |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
| Michrochem Drums (55 gal.) | [redacted] | | | | | | | | | |
| Michrochem Cost per Drum | | | | | | | | | | |
| Total (# of drums (x) Cost per Drum | | | | | | | | | | |
| Total Michrochem Consumed * | | | | | | | | | | |
| Number Of Showers per Year ** | | | | | | | | | | |
| System Maintenance | | | | | | | | | | |
| | | | | | | | | | | |
| Total | | | | | | | | | | |

Note: Chart above does not reflect the costs associated with the square footage adjustment. See table A3.2 for total costs.
Per O&M staff, assume 75% of each drum used *
Assume 5.6 L Microchem per Shower **

**Table 3.2.13 Chemical Shower Cost Summary**

3.2.14 HEPA Filters - The major cost associated with HEPA filtration is the maintenance of the equipment. The other costs associated are the filters themselves. Table 3.2.14 provides the breakdown of the estimated HEPA filtration system O&M costs. Costs associated with first time replacement of these filters once the facility is turned over to the government are included as part of the first time construction costs.

| HEPA Filter Maintenance Cost | 2014/2015 | 2015/2016 | 2016/2017 | 2017/2018 | 2018/2019 | 2019/2020 | 2020/2021 | 2021/2022 | Average | %** |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
| O&M Costs | [redacted] | | | | | | | | | |
| HEPA Filters | | | | | | | | | | |
| | | | | | | | | | | |
| Total | | | | | | | | | | |
| Cost Per Filter | | | | | | | | | | |

Note: Chart above does not reflect the costs associated with the square footage adjustment. See table A3.2 for total costs.
Note: 127 Double HEPA Filters + 84 Single HEPA Filters. 211 HEPA Housings

**Table 3.2.14 HEPA Filter Maintenance Cost**

3.2.15 Liquid Nitrogen and Refrigeration - The liquid nitrogen system costs include maintenance of mobile nitrogen type refrigeration units and the cost of maintaining the facility's nitrogen stock. The facility refrigeration system encompasses cold rooms and spot cooling, with O&M representing its largest cost factor. Table 3.2.15 provides the breakdown of the estimated liquid nitrogen and refrigeration systems O&M costs.

| Liquid Nitrogen System Cost | 2014/2015 | 2015/2016 | 2016/2017 | 2017/2018 | 2018/2019 | 2019/2020 | 2020/2021 | 2021/2022 | Average | %** |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen Cost | [redacted] | | | | | | | | | |
| Refrigeration Service | | | | | | | | | | |
| O&M Costs | | | | | | | | | | |
| Total | | | | | | | | | | |

Note: Chart above does not reflect the costs associated with the square footage adjustment. See table A3.2 for total costs.

**Table 3.2.15 Liquid Nitrogen System Cost**

3.2.16 Biosafety Cabinets and Fume Hoods - Table 3.2.16 provides the breakdown of the estimated biosafety cabinets and fume hoods system O&M costs.

| Biosafety Cabinets and Fumehood Cost | 2014/2015 | 2015/2016 | 2016/2017 | 2017/2018 | 2018/2019 | 2019/2020 | 2020/2021 | 2021/2022 | Average | % ** |
|---|---|---|---|---|---|---|---|---|---|---|
| Maintenance Contracts * | [redacted] | | | | | | | | | |
| BSC Repair / Recertification | | | | | | | | | | |
| O&M Cabinets | | | | | | | | | | |
| O&M Fume Hoods | | | | | | | | | | |
| Total | | | | | | | | | | |

Note: Chart above does not reflect the costs associated with the square footage adjustment. See table A3.2 for total costs.
Canceled in 2002 *
Note: 165 Total Cabinets & 28 Total Hoods

**Table 3.2.16 Biosafety Cabinets and Fumehood Cost**

3.2.17 Autoclaves - Table 3.2.17 provides the breakdown of the estimated autoclave system O&M costs.

| Autoclaves Cycles and Consumption | 2014/2015 | 2015/2016 | 2016/2017 | 2017/2018 | 2018/2019 | 2019/2020 | 2020/2021 | 2021/2022 | Average | %** |
|---|---|---|---|---|---|---|---|---|---|---|
| Soft Water Cost | [redacted] | | | | | | | | | |
| System Maintenance | | | | | | | | | | |
| Autoclave PRVs | | | | | | | | | | |
| SO Contract (large) | | | | | | | | | | |
| SO Contract (small) | | | | | | | | | | |
| Total | | | | | | | | | | |

Note: Chart above does not reflect the costs associated with the square footage adjustment. See table A3.2 for total costs.

**Table 3.2.17 Autoclaves Cycles and Consumption**

3.2.18 UPS System - Table 3.2.18 provides the breakdown of the estimated UPS system O&M costs.

| UPS System Costs | 2014/2015 | 2015/2016 | 2016/2017 | 2017/2018 | 2018/2019 | 2019/2020 | 2020/2021 | 2021/2022 | Average | % |
|---|---|---|---|---|---|---|---|---|---|---|
| System maintenance | [redacted] | | | | | | | | | |
| O&M Costs | | | | | | | | | | |
| Total | | | | | | | | | | |

Note: Chart above does not reflect the costs associated with the square footage adjustment. See table A3.2 for total costs.

**Table 3.2.18 UPS System**

3.2.19 Reverse Osmosis Water – Table 3.2.19 provides the breakdown of the estimated reverse osmosis water system O&M costs.

| Reverse Osmosis Water System Cost | 2014/2015 | 2015/2016 | 2016/2017 | 2017/2018 | 2018/2019 | 2019/2020 | 2020/2021 | 2021/2022 | Average | % |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
| Water Cost | | | | | | | | | | |
| Service Cost | | | | | | | | | | |
| | | | | | | | | | | |
| Total | | | | | | | | | | |

Note: Chart above does not reflect the costs associated with the square footage adjustment. See table A3.2 for total costs.

**Table 3.2.19 Reverse Osmosis Water**

3.2.20 Electrical System – Table 3.2.20 provides the breakdown of the estimated electrical systems O&M costs.

| Additional Electrical Costs | 2014/2015 | 2015/2016 | 2016/2017 | 2017/2018 | 2018/2019 | 2019/2020 | 2020/2021 | 2021/2022 | Average | % |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
| Service Contracts | | | | | | | | | | |
| Emergency Switchgear | | | | | | | | | | |
| Air Breakers | | | | | | | | | | |
| Misc. Hardware | | | | | | | | | | |
| Electrical Supplies | | | | | | | | | | |
| Lights and Lamps | | | | | | | | | | |
| Tools < $1,000 | | | | | | | | | | |
| Electrical Lighting | | | | | | | | | | |
| Electrical Distribution | | | | | | | | | | |
| Electrical Testing | | | | | | | | | | |
| Variable Frequency Drives | | | | | | | | | | |
| O&M Costs | | | | | | | | | | |
| | | | | | | | | | | |
| Total | | | | | | | | | | |

Note: Chart above does not reflect the costs associated with the square footage adjustment. See table A3.2 for total costs.

**Table 3.2.20 Electrical System**

3.2.21 Water and Sewer System – Table 3.2.21 provides the breakdown of the estimated water and sewer systems O&M costs.

| Additional Water Costs | 2014/2015 | 2015/2016 | 2016/2017 | 2017/2018 | 2018/2019 | 2019/2020 | 2020/2021 | 2021/2022 | Average | %** |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
| Service Contracts | | | | | | | | | | |
| Plumbing Equipment | | | | | | | | | | |
| Domestic Water System | | | | | | | | | | |
| Tools < $1,000 | | | | | | | | | | |
| Minor Plumbing Repairs | | | | | | | | | | |
| O&M Costs | | | | | | | | | | |
| | | | | | | | | | | |
| Total | | | | | | | | | | |

Note: Chart above does not reflect the costs associated with the square footage adjustment. See table A3.2 for total costs.

**Table 3.2.21 Water and Sewer System**

## 3.3. UTILITY COSTS

### 3.3.1. Introduction

This report analyzes and estimates the anticipated utility costs specific at each of the six sites being evaluated. These costs have been evaluated using the anticipated degree days (outside air conditions), program loads, and utility rates as provided by each site consortia. As the degree days and loads are directly related to the site and/or program, the utility rates should be further evaluated with the specific provider at each site once the design is further developed.

Heating and cooling loads have been estimated based on outside air conditions at the six sites as outlined below. These loads are used in determining the anticipated utility consumptions.

**Summer:**

| Region | Dry-Bulb Temp, deg F | Wet-Bulb Temp, deg F |
|---|---|---|
| Athens, GA | 89.0 | 78.0 |
| Manhattan, KS | 90.0 | 79.0 |
| Flora, MS | 90.0 | 80.0 |
| Butner, NC | 88.0 | 78.0 |
| Plum Island, NY | 83.0 | 76.0 |
| San Antonio, TX | 87.0 | 78.0 |

**Winter:**

| Region | Dry-Bulb Temp, deg F | Moisture, Gr/lb |
|---|---|---|
| Athens, GA | 20.0 | 7.74 |
| Manhattan, KS | -2.0 | 2.56 |
| Flora, MS | 21.0 | 8 |
| Butner, NC | 16.0 | 6.3 |
| Plum Island, NY | 8.0 | 4.2 |
| San Antonio, TX | 26.0 | 10.3 |

3.3.2. Electricity - A minimum of two redundant medium voltage services with multiple feeders are required to serve the NBAF campus regardless of which site it is located at. The specific arrangement of final electrical service would need to be coordinated with the utility provider during the design phase of the project.

A utility substation at 34.5 kV is required on site with two transformers feeding 15 kV Class switchgear in a main-tie-main arrangement. The secondary feeders would provide primary electric service at 13.8 kV to the Central Utility Plant (CUP) and to the building.

The total normal power load required to accommodate the specific site infrastructure loads as well as the typical building load ranges from 12.8 MW – 13.1MW depending on the site. Table 3.3, at the end of section 3.3, indicates the specific utility demands and estimated annual costs for each site.

3.3.3. Gas - Table 3.3, at the end of section 3.3, indicates the specific utility demands and estimated annual costs for each site.

3.3.4. Fuel Oil - NBAF has two consumers of fuel oil, the boiler plant and emergency generators. The current program requires that there be a 30-day supply of fuel storage. The assumption is that this storage facility would be located adjacent to the CUP and the initial costs for providing this fuel is included in the cost of the CUP itself. Table 3.3, at the end of section 3.3, indicates the specific utility demands and estimated annual costs for each site.

3.3.5. Water and Sewer - Table 3.3, at the end of section 3.3, indicates the specific utility demands and estimated annual costs for each site.

3.3.6. Storm Water - Much like a kilowatt or a therm serves as the basis for other utilities, the Equivalent Runoff Unit, or ERU, is the base unit for a stormwater utility. An ERU is a measure of the amount of impervious surface on a property. Impervious surfaces, like a concrete parking area or a rooftop, do not allow stormwater to soak into the ground. These surfaces increase the amount of stormwater that runs off of the property and must be managed by the stormwater system. Table 3.3, at the end of section 3.3, indicates the specific utility annual costs for each site.

| Utilities | GA | | | KS | | | MS | | | NC | | | NY | | | TX | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Demand | Rate | Cost | Demand | Rate | Cost | Demand | Rate | Cost | Demand | Rate | Cost | Demand | Rate | Cost | Demand | Rate | Cost |
| Electricity (kW) | 12,800 | $0.0609 | $5,531,162 | 13,100 | $0.0516 | $4,796,342 | 13,100 | $0.0650 | $6,041,903 | 12,800 | $0.0708 | $6,430,317 | 12,400 | $0.0609 | $5,292,161 | 12,800 | $0.0494 | $4,486,690 |
| Natural Gas (mmBtu/Yr) | 110,630 | $8.40 | $929,292 | 141,000 | $7.60 | $1,071,600 | 108,000 | $7.76 | $838,080 | 119,000 | $10.05 | $1,195,950 | 0 | $0.00 | $0 | 110,630 | $10.05 | $1,111,832 |
| Fuel Oil (Gal/Yr) | 75,000 | $3.00 | $225,000 | 75,000 | $3.00 | $225,000 | 75,000 | $3.00 | $225,000 | 75,000 | $3.00 | $225,000 | 1,000,000 | $3.00 | $3,000,000 | 75,000 | $3.00 | $225,000 |
| Domestic Water (Gal/Yr) | 43,000,000 | $0.00354 | $152,220 | 37,750,000 | $0.00137 | $51,718 | 48,150,000 | $0.00133 | $64,040 | 39,500,000 | $0.00684 | $270,180 | 36,500,000 | $0.00000 | $0 | 51,750,000 | $0.00684 | $353,970 |
| Sanitary (Gal/Yr) | 26,500,000 | $0.00298 | $78,970 | 25,000,000 | $0.00168 | $42,000 | 28,250,000 | $0.00066 | $18,645 | 25,500,000 | $0.02137 | $544,935 | 23,000,000 | $0.00000 | $0 | 29,250,000 | $0.02137 | $625,073 |
| Storm Water (Impact Fees/Yr) | | | $12,000 | | | $2,700 | | | $0 | | | $0 | | | $0 | | | $1,818 |
| **Totals** | | | **$6,928,644** | | | **$6,189,359** | | | **$7,187,668** | | | **$8,666,382** | | | **$8,292,161** | | | **$6,804,382** |

1. The electricity conversion to kWh used was total demand in kW (12,800 or 13,100) x 8760 hrs/yr x 0.81 = 90,823,680 kHr. The 0.81 "load factor" represents the percentage of the year (hours) that the facility will operate at the given demand. This is consistent with other CDC project demands at their main campus in Atlanta, GA.
 - 12,400 kW = 86,899,200 kHr
 - 12,800 kW = 90,823,680 kHr
 - 13,100 kW = 92,952,360 kHr
2. Water and Sewer rates were not provided by the North Carolina consortia thus higher rates were used as an allowance.
3. Natural gas rates were not located for the San Antonio, Texas site and thus the higher gas rate was used.

Table 3.3 – Site Specific Utility Summary

Intentionally Left Blank

## 3.4. SALARIES

### 3.4.1. Salary Introduction

The salaries of all Technical, Plant, Building Operations, and HEPA NBAF staff are shown in the following tables which are site specific using the governments labor rates. These tables represent the anticipated staff with their pay grade.

## Anticipated Salaries - Athens, Georgia

| Personnel/Position | Qty | Est. Annual Salary w/ Benefits | Total Annual Salary/Position | Comments |
|---|---|---|---|---|
| ***Operations & Maintenance/Security*** | | | | |
| O&M Contract Employees | 92 | $58,261.00 | $5,360,012.00 | Based on current PIADC |
| O&M Contract Manager | 1 | $126,813.00 | $126,813.00 | numbers from Charlie |
| Security Guard (Full-Time) | 10 | $76,720.00 | $767,200.00 | Wenderoth |
| Security Guard (Part-Time) | 40 | $52,906.00 | $2,116,240.00 | |
| Guard Supervisor | 1 | $91,232.00 | $91,232.00 | |
| Security Manager | 1 | $126,813.00 | $126,813.00 | |
| Subtotal | **145** | | **$8,588,310.00** | |
| ***Scientific Staff and Support*** | | | | |
| USDA-APHIS | | | | |
| Laboratory Chief | 1 | $200,000.00 | $200,000.00 | Based on APHIS |
| Secretary | 1 | $52,906.00 | $52,906.00 | Programming Questionnaire |
| Admin/Support | 1 | $43,249.00 | $43,249.00 | dated 2/20/07 |
| OAA | 1 | $107,805.00 | $107,805.00 | |
| Senior Staff Veterinarian | 1 | $126,813.00 | $126,813.00 | |
| PDS Training Specialist | 1 | $126,813.00 | $126,813.00 | |
| Quality Assurance Manager | 1 | $107,805.00 | $107,805.00 | |
| Training Technician | 1 | $91,232.00 | $91,232.00 | |
| Computer Specialist | 1 | $91,232.00 | $91,232.00 | |
| Laboratory Control Technician | 1 | $91,232.00 | $91,232.00 | |
| DSS/RVSS/PVSS Head | 3 | $126,813.00 | $380,439.00 | |
| DSS Pathologist | 1 | $126,813.00 | $126,813.00 | |
| DSS Epidemiologist | 1 | $126,813.00 | $126,813.00 | |
| DSS Microbiologist | 6 | $126,813.00 | $760,878.00 | |
| DSS VMO/Microbiologist | 2 | $126,813.00 | $253,626.00 | |
| DSS QA Technician | 1 | $64,008.00 | $64,008.00 | |
| DSS Technician | 6 | $52,906.00 | $317,436.00 | |
| RVS VMO | 4 | $107,805.00 | $431,220.00 | |
| RVS Microbiologist | 6 | $107,805.00 | $646,830.00 | |
| RVS Technician 3 | 7 | $76,720.00 | $537,040.00 | |
| NAFMDVB Manager | 1 | $126,813.00 | $126,813.00 | |
| NAFMDVB Micro/Chemist | 2 | $107,805.00 | $215,610.00 | |
| PVS VMO | 1 | $107,805.00 | $107,805.00 | |
| PVS Bioinformatics | 1 | $107,805.00 | $107,805.00 | |
| PVS Microbiologist (NAHLN) | 1 | $107,805.00 | $107,805.00 | |
| PVS Microbiologist | 6 | $107,805.00 | $646,830.00 | |
| PVS Technician (NAHLN) | 3 | $76,720.00 | $230,160.00 | |
| PVS Technician | 6 | $76,720.00 | $460,320.00 | |
| FADDL Microbiologist | 1 | $107,805.00 | $107,805.00 | |
| FADDL Technician | 1 | $76,720.00 | $76,720.00 | |
| Animal Caretaker | 1 | $76,720.00 | $76,720.00 | |
| Subtotal | **71** | | **$6,948,583.00** | |

**Table 3.4.1.A1 – Staff and Salary Analysis – Athens, Georgia**

## Anticipated Salaries - Athens, Georgia

| Personnel/Position | Qty | Est. Annual Salary w/ Benefits | Total Annual Salary/Position | Comments |
|---|---|---|---|---|
| USDA-ARS | | | | |
| Laboratory Director | 1 | $200,000.00 | $200,000.00 | Based on ARS POR |
| Microbiologist | 7 | $126,813.00 | $887,691.00 | proposed facility staff |
| Epidemiologist | 1 | $126,813.00 | $126,813.00 | dated 2/11/2007 |
| Bioinformatics | 1 | $126,813.00 | $126,813.00 | |
| Immunologist | 2 | $126,813.00 | $253,626.00 | |
| Biochemist | 1 | $126,813.00 | $126,813.00 | |
| Entomologist | 2 | $126,813.00 | $253,626.00 | |
| Pathologist | 2 | $126,813.00 | $253,626.00 | |
| Cell Biologist | 1 | $126,813.00 | $126,813.00 | |
| Veterinary Clinician | 2 | $126,813.00 | $253,626.00 | |
| Post-Doctoral Fellow | 14 | $91,232.00 | $1,277,248.00 | |
| Scientific Personnel | 15 | $91,232.00 | $1,368,480.00 | |
| Administrative Personnel | 8 | $76,720.00 | $613,760.00 | |
| Visiting Scientist | 6 | $126,813.00 | $760,878.00 | |
| Visiting Scientific Personnel | 4 | $91,232.00 | $364,928.00 | |
| Visiting Post-Docs | 4 | $91,232.00 | $364,928.00 | |
| Visiting Veterinary Clinicians | 4 | $107,805.00 | $431,220.00 | |
| Visiting Research Fellows | 5 | $91,232.00 | $456,160.00 | |
| Subtotal | **80** | | **$8,247,049.00** | |
| DHS | | | | |
| Group Leader | 1 | $200,000.00 | $200,000.00 | Based on D. Brake Input |
| Direct Reports | 4 | $126,813.00 | $507,252.00 | document dated 1/10/07 |
| Staff/Direct Report | 6 | $107,805.00 | $646,830.00 | |
| Staff | 19 | $91,232.00 | $1,733,408.00 | |
| Subtotal | **30** | | **$3,087,490.00** | |
| **Totals for Staff and Annual Salaries** | **326** | | **$26,871,432.00** | |

**Table 3.4.1.A2 – Staff and Salary Analysis – Athens, Georgia**

## Anticipated Salaries - Manhattan, Kansas

| Personnel/Position | Qty | Est. Annual Salary w/ Benefits | Total Annual Salary/Position | Comments |
|---|---|---|---|---|
| ***Operations & Maintenance/Security*** | | | | |
| O&M Contract Employees | 92 | $56,214.00 | $5,171,688.00 | Based on current PIADC |
| O&M Contract Manager | 1 | $122,359.00 | $122,359.00 | numbers from Charlie |
| Security Guard (Full-Time) | 10 | $74,025.00 | $740,250.00 | Wenderoth |
| Security Guard (Part-Time) | 40 | $51,048.00 | $2,041,920.00 | |
| Guard Supervisor | 1 | $88,028.00 | $88,028.00 | |
| Security Manager | 1 | $122,359.00 | $122,359.00 | |
| Subtotal | **145** | | **$8,286,604.00** | |
| ***Scientific Staff and Support*** | | | | |
| USDA-APHIS | | | | |
| Laboratory Chief | 1 | $200,000.00 | $200,000.00 | Based on APHIS |
| Secretary | 1 | $51,048.00 | $51,048.00 | Programming Questionnaire |
| Admin/Support | 1 | $41,729.00 | $41,729.00 | dated 2/20/07 |
| OAA | 1 | $104,018.00 | $104,018.00 | |
| Senior Staff Veterinarian | 1 | $122,359.00 | $122,359.00 | |
| PDS Training Specialist | 1 | $122,359.00 | $122,359.00 | |
| Quality Assurance Manager | 1 | $125,000.00 | $125,000.00 | |
| Training Technician | 1 | $88,028.00 | $88,028.00 | |
| Computer Specialist | 1 | $88,028.00 | $88,028.00 | |
| Laboratory Control Technician | 1 | $88,028.00 | $88,028.00 | |
| DSS/RVSS/PVSS Head | 3 | $122,359.00 | $367,077.00 | |
| DSS Pathologist | 1 | $122,359.00 | $122,359.00 | |
| DSS Epidemiologist | 1 | $122,359.00 | $122,359.00 | |
| DSS Microbiologist | 6 | $122,359.00 | $734,154.00 | |
| DSS VMO/Microbiologist | 2 | $122,359.00 | $244,718.00 | |
| DSS QA Technician | 1 | $61,760.00 | $61,760.00 | |
| DSS Technician | 6 | $51,048.00 | $306,288.00 | |
| RVS VMO | 4 | $104,018.00 | $416,072.00 | |
| RVS Microbiologist | 6 | $104,018.00 | $624,108.00 | |
| RVS Technician 3 | 7 | $74,025.00 | $518,175.00 | |
| NAFMDVB Manager | 1 | $122,359.00 | $122,359.00 | |
| NAFMDVB Micro/Chemist | 2 | $104,018.00 | $208,036.00 | |
| PVS VMO | 1 | $104,018.00 | $104,018.00 | |
| PVS Bioinformatics | 1 | $104,018.00 | $104,018.00 | |
| PVS Microbiologist (NAHLN) | 1 | $104,018.00 | $104,018.00 | |
| PVS Microbiologist | 6 | $104,018.00 | $624,108.00 | |
| PVS Technician (NAHLN) | 3 | $74,025.00 | $222,075.00 | |
| PVS Technician | 6 | $74,025.00 | $444,150.00 | |
| FADDL Microbiologist | 1 | $104,018.00 | $104,018.00 | |
| FADDL Technician | 1 | $74,025.00 | $74,025.00 | |
| Animal Caretaker | 1 | $74,025.00 | $74,025.00 | |
| Subtotal | **71** | | **$6,732,517.00** | |

**Table 3.4.1.B1 – Staff and Salary Analysis – Manhattan, Kansas**

## Anticipated Salaries - Manhattan, Kansas

| Personnel/Position | Qty | Est. Annual Salary w/ Benefits | Total Annual Salary/Position | Comments |
|---|---|---|---|---|
| USDA-ARS | | | | |
| Laboratory Director | 1 | $200,000.00 | $200,000.00 | Based on ARS POR |
| Microbiologist | 7 | $122,359.00 | $856,513.00 | proposed facility staff |
| Epidemiologist | 1 | $122,359.00 | $122,359.00 | dated 2/11/2007 |
| Bioinformatics | 1 | $122,359.00 | $122,359.00 | |
| Immunologist | 2 | $122,359.00 | $244,718.00 | |
| Biochemist | 1 | $122,359.00 | $122,359.00 | |
| Entomologist | 2 | $122,359.00 | $244,718.00 | |
| Pathologist | 2 | $122,359.00 | $244,718.00 | |
| Cell Biologist | 1 | $122,359.00 | $122,359.00 | |
| Veterinary Clinician | 2 | $122,359.00 | $244,718.00 | |
| Post-Doctoral Fellow | 14 | $74,025.00 | $1,036,350.00 | |
| Scientific Personnel | 15 | $74,025.00 | $1,110,375.00 | |
| Administrative Personnel | 8 | $74,025.00 | $592,200.00 | |
| Visiting Scientist | 6 | $122,359.00 | $734,154.00 | |
| Visiting Scientific Personnel | 4 | $74,025.00 | $296,100.00 | |
| Visiting Post-Docs | 4 | $74,025.00 | $296,100.00 | |
| Visiting Veterinary Clinicians | 4 | $100,000.00 | $400,000.00 | |
| Visiting Research Fellows | 5 | $74,025.00 | $370,125.00 | |
| Subtotal | **80** | | **$7,360,225.00** | |
| DHS | | | | |
| Group Leader | 1 | $200,000.00 | $200,000.00 | Based on D. Brake Input |
| Direct Reports | 4 | $122,359.00 | $489,436.00 | document dated 1/10/07 |
| Staff/Direct Report | 6 | $104,018.00 | $624,108.00 | |
| Staff | 19 | $74,025.00 | $1,406,475.00 | |
| Subtotal | **30** | | **$2,720,019.00** | |
| **Totals for Staff and Annual Salaries** | **326** | | **$25,099,365.00** | |

**Table 3.4.1.B2 – Staff and Salary Analysis – Manhattan, Kansas**

## Anticipated Salaries - Flora, Mississippi

| Personnel/Position | Qty | Est. Annual Salary w/ Benefits | Total Annual Salary/Position | Comments |
|---|---|---|---|---|
| ***Operations & Maintenance/Security*** | | | | |
| O&M Contract Employees | 92 | $56,214.00 | $5,171,688.00 | Based on current PIADC |
| O&M Contract Manager | 1 | $122,359.00 | $122,359.00 | numbers from Charlie |
| Security Guard (Full-Time) | 10 | $74,025.00 | $740,250.00 | Wenderoth |
| Security Guard (Part-Time) | 40 | $51,048.00 | $2,041,920.00 | |
| Guard Supervisor | 1 | $88,028.00 | $88,028.00 | |
| Security Manager | 1 | $122,359.00 | $122,359.00 | |
| Subtotal | **145** | | **$8,286,604.00** | |
| ***Scientific Staff and Support*** | | | | |
| USDA-APHIS | | | | |
| Laboratory Chief | 1 | $200,000.00 | $200,000.00 | Based on APHIS |
| Secretary | 1 | $51,048.00 | $51,048.00 | Programming Questionnaire |
| Admin/Support | 1 | $41,729.00 | $41,729.00 | dated 2/20/07 |
| OAA | 1 | $104,018.00 | $104,018.00 | |
| Senior Staff Veterinarian | 1 | $122,359.00 | $122,359.00 | |
| PDS Training Specialist | 1 | $122,359.00 | $122,359.00 | |
| Quality Assurance Manager | 1 | $125,000.00 | $125,000.00 | |
| Training Technician | 1 | $88,028.00 | $88,028.00 | |
| Computer Specialist | 1 | $88,028.00 | $88,028.00 | |
| Laboratory Control Technician | 1 | $88,028.00 | $88,028.00 | |
| DSS/RVSS/PVSS Head | 3 | $122,359.00 | $367,077.00 | |
| DSS Pathologist | 1 | $122,359.00 | $122,359.00 | |
| DSS Epidemiologist | 1 | $122,359.00 | $122,359.00 | |
| DSS Microbiologist | 6 | $122,359.00 | $734,154.00 | |
| DSS VMO/Microbiologist | 2 | $122,359.00 | $244,718.00 | |
| DSS QA Technician | 1 | $61,760.00 | $61,760.00 | |
| DSS Technician | 6 | $51,048.00 | $306,288.00 | |
| RVS VMO | 4 | $104,018.00 | $416,072.00 | |
| RVS Microbiologist | 6 | $104,018.00 | $624,108.00 | |
| RVS Technician 3 | 7 | $74,025.00 | $518,175.00 | |
| NAFMDVB Manager | 1 | $122,359.00 | $122,359.00 | |
| NAFMDVB Micro/Chemist | 2 | $104,018.00 | $208,036.00 | |
| PVS VMO | 1 | $104,018.00 | $104,018.00 | |
| PVS Bioinformatics | 1 | $104,018.00 | $104,018.00 | |
| PVS Microbiologist (NAHLN) | 1 | $104,018.00 | $104,018.00 | |
| PVS Microbiologist | 6 | $104,018.00 | $624,108.00 | |
| PVS Technician (NAHLN) | 3 | $74,025.00 | $222,075.00 | |
| PVS Technician | 6 | $74,025.00 | $444,150.00 | |
| FADDL Microbiologist | 1 | $104,018.00 | $104,018.00 | |
| FADDL Technician | 1 | $74,025.00 | $74,025.00 | |
| Animal Caretaker | 1 | $74,025.00 | $74,025.00 | |
| Subtotal | **71** | | **$6,732,517.00** | |

**Table 3.4.1.C1 – Staff and Salary Analysis – Flora, Mississippi**

## Anticipated Salaries - Flora, Mississippi

| Personnel/Position | Qty | Est. Annual Salary w/ Benefits | Total Annual Salary/Position | Comments |
|---|---|---|---|---|
| USDA-ARS | | | | |
| Laboratory Director | 1 | $200,000.00 | $200,000.00 | Based on ARS POR |
| Microbiologist | 7 | $122,359.00 | $856,513.00 | proposed facility staff |
| Epidemiologist | 1 | $122,359.00 | $122,359.00 | dated 2/11/2007 |
| Bioinformatics | 1 | $122,359.00 | $122,359.00 | |
| Immunologist | 2 | $122,359.00 | $244,718.00 | |
| Biochemist | 1 | $122,359.00 | $122,359.00 | |
| Entomologist | 2 | $122,359.00 | $244,718.00 | |
| Pathologist | 2 | $122,359.00 | $244,718.00 | |
| Cell Biologist | 1 | $122,359.00 | $122,359.00 | |
| Veterinary Clinician | 2 | $122,359.00 | $244,718.00 | |
| Post-Doctoral Fellow | 14 | $74,025.00 | $1,036,350.00 | |
| Scientific Personnel | 15 | $74,025.00 | $1,110,375.00 | |
| Administrative Personnel | 8 | $74,025.00 | $592,200.00 | |
| Visiting Scientist | 6 | $122,359.00 | $734,154.00 | |
| Visiting Scientific Personnel | 4 | $74,025.00 | $296,100.00 | |
| Visiting Post-Docs | 4 | $74,025.00 | $296,100.00 | |
| Visiting Veterinary Clinicians | 4 | $100,000.00 | $400,000.00 | |
| Visiting Research Fellows | 5 | $74,025.00 | $370,125.00 | |
| Subtotal | **80** | | **$7,360,225.00** | |
| DHS | | | | |
| Group Leader | 1 | $200,000.00 | $200,000.00 | Based on D. Brake Input |
| Direct Reports | 4 | $122,359.00 | $489,436.00 | document dated 1/10/07 |
| Staff/Direct Report | 6 | $104,018.00 | $624,108.00 | |
| Staff | 19 | $74,025.00 | $1,406,475.00 | |
| Subtotal | **30** | | **$2,720,019.00** | |
| **Totals for Staff and Annual Salaries** | **326** | | **$25,099,365.00** | |

**Table 3.4.1.C2 – Staff and Salary Analysis – Flora, Mississippi**

## Anticipated Salaries - Butner, North Carolina

| Personnel/Position | Qty | Est. Annual Salary w/ Benefits | Total Annual Salary/Position | Comments |
|---|---|---|---|---|
| ***Operations & Maintenance/Security*** | | | | |
| O&M Contract Employees | 92 | $58,022.00 | $5,338,024.00 | Based on current PIADC |
| O&M Contract Manager | 1 | $126,294.00 | $126,294.00 | numbers from Charlie |
| Security Guard (Full-Time) | 10 | $76,406.00 | $764,060.00 | Wenderoth |
| Security Guard (Part-Time) | 40 | $52,689.00 | $2,107,560.00 | |
| Guard Supervisor | 1 | $90,859.00 | $90,859.00 | |
| Security Manager | 1 | $126,294.00 | $126,294.00 | |
| Subtotal | **145** | | **$8,553,091.00** | |
| ***Scientific Staff and Support*** | | | | |
| USDA-APHIS | | | | |
| Laboratory Chief | 1 | $200,000.00 | $200,000.00 | Based on APHIS |
| Secretary | 1 | $52,689.00 | $52,689.00 | Programming Questionnaire |
| Admin/Support | 1 | $43,072.00 | $43,072.00 | dated 2/20/07 |
| OAA | 1 | $107,363.00 | $107,363.00 | |
| Senior Staff Veterinarian | 1 | $126,294.00 | $126,294.00 | |
| PDS Training Specialist | 1 | $126,294.00 | $126,294.00 | |
| Quality Assurance Manager | 1 | $107,363.00 | $107,363.00 | |
| Training Technician | 1 | $90,859.00 | $90,859.00 | |
| Computer Specialist | 1 | $90,859.00 | $90,859.00 | |
| Laboratory Control Technician | 1 | $90,859.00 | $90,859.00 | |
| DSS/RVSS/PVSS Head | 3 | $126,294.00 | $378,882.00 | |
| DSS Pathologist | 1 | $126,294.00 | $126,294.00 | |
| DSS Epidemiologist | 1 | $126,294.00 | $126,294.00 | |
| DSS Microbiologist | 6 | $126,294.00 | $757,764.00 | |
| DSS VMO/Microbiologist | 2 | $126,294.00 | $252,588.00 | |
| DSS QA Technician | 1 | $63,746.00 | $63,746.00 | |
| DSS Technician | 6 | $52,689.00 | $316,134.00 | |
| RVS VMO | 4 | $107,363.00 | $429,452.00 | |
| RVS Microbiologist | 6 | $107,363.00 | $644,178.00 | |
| RVS Technician 3 | 7 | $76,406.00 | $534,842.00 | |
| NAFMDVB Manager | 1 | $126,294.00 | $126,294.00 | |
| NAFMDVB Micro/Chemist | 2 | $107,363.00 | $214,726.00 | |
| PVS VMO | 1 | $107,363.00 | $107,363.00 | |
| PVS Bioinformatics | 1 | $107,363.00 | $107,363.00 | |
| PVS Microbiologist (NAHLN) | 1 | $107,363.00 | $107,363.00 | |
| PVS Microbiologist | 6 | $107,363.00 | $644,178.00 | |
| PVS Technician (NAHLN) | 3 | $76,406.00 | $229,218.00 | |
| PVS Technician | 6 | $76,406.00 | $458,436.00 | |
| FADDL Microbiologist | 1 | $107,363.00 | $107,363.00 | |
| FADDL Technician | 1 | $76,406.00 | $76,406.00 | |
| Animal Caretaker | 1 | $76,406.00 | $76,406.00 | |
| Subtotal | **71** | | **$6,920,942.00** | |

**Table 3.4.1.D1 – Staff and Salary Analysis – Butner, North Carolina**

## Anticipated Salaries - Butner, North Carolina

| Personnel/Position | Qty | Est. Annual Salary w/ Benefits | Total Annual Salary/Position | Comments |
|---|---|---|---|---|
| USDA-ARS | | | | |
| Laboratory Director | 1 | $200,000.00 | $200,000.00 | Based on ARS POR |
| Microbiologist | 7 | $126,294.00 | $884,058.00 | proposed facility staff |
| Epidemiologist | 1 | $126,294.00 | $126,294.00 | dated 2/11/2007 |
| Bioinformatics | 1 | $126,294.00 | $126,294.00 | |
| Immunologist | 2 | $126,294.00 | $252,588.00 | |
| Biochemist | 1 | $126,294.00 | $126,294.00 | |
| Entomologist | 2 | $126,294.00 | $252,588.00 | |
| Pathologist | 2 | $126,294.00 | $252,588.00 | |
| Cell Biologist | 1 | $126,294.00 | $126,294.00 | |
| Veterinary Clinician | 2 | $126,294.00 | $252,588.00 | |
| Post-Doctoral Fellow | 14 | $90,859.00 | $1,272,026.00 | |
| Scientific Personnel | 15 | $90,859.00 | $1,362,885.00 | |
| Administrative Personnel | 8 | $63,746.00 | $509,968.00 | |
| Visiting Scientist | 6 | $126,294.00 | $757,764.00 | |
| Visiting Scientific Personnel | 4 | $90,859.00 | $363,436.00 | |
| Visiting Post-Docs | 4 | $90,859.00 | $363,436.00 | |
| Visiting Veterinary Clinicians | 4 | $107,363.00 | $429,452.00 | |
| Visiting Research Fellows | 5 | $90,859.00 | $454,295.00 | |
| Subtotal | **80** | | **$8,112,848.00** | |
| DHS | | | | |
| Group Leader | 1 | $200,000.00 | $200,000.00 | Based on D. Brake Input |
| Direct Reports | 4 | $126,294.00 | $505,176.00 | document dated 1/10/07 |
| Staff/Direct Report | 6 | $107,363.00 | $644,178.00 | |
| Staff | 19 | $90,859.00 | $1,726,321.00 | |
| Subtotal | **30** | | **$3,075,675.00** | |
| **Totals for Staff and Annual Salaries** | **326** | | **$26,662,556.00** | |

**Table 3.4.1.D2 – Staff and Salary Analysis – Butner, North Carolina**

## Anticipated Salaries - Plum Island, New York

| Personnel/Position | Qty | Est. Annual Salary w/ Benefits | Total Annual Salary/Position | Comments |
|---|---|---|---|---|
| ***Operations & Maintenance/Security*** | | | | |
| O&M Contract Employees | 92 | $61,573.00 | $5,664,716.00 | Based on current PIADC |
| O&M Contract Manager | 1 | $134,024.00 | $134,024.00 | numbers from Charlie |
| Security Guard (Full-Time) | 10 | $81,083.00 | $810,830.00 | Wenderoth |
| Security Guard (Part-Time) | 40 | $55,914.00 | $2,236,560.00 | |
| Guard Supervisor | 1 | $96,420.00 | $96,420.00 | |
| Security Manager | 1 | $134,024.00 | $134,024.00 | |
| Subtotal | **145** | | **$9,076,574.00** | |
| ***Scientific Staff and Support*** | | | | |
| USDA-APHIS | | | | |
| Laboratory Chief | 1 | $200,000.00 | $200,000.00 | Based on APHIS |
| Secretary | 1 | $55,914.00 | $55,914.00 | Programming Questionnaire |
| Admin/Support | 1 | $45,708.00 | $45,708.00 | dated 2/20/07 |
| OAA | 1 | $113,935.00 | $113,935.00 | |
| Senior Staff Veterinarian | 1 | $134,024.00 | $134,024.00 | |
| PDS Training Specialist | 1 | $134,024.00 | $134,024.00 | |
| Quality Assurance Manager | 1 | $113,935.00 | $113,935.00 | |
| Training Technician | 1 | $96,420.00 | $96,420.00 | |
| Computer Specialist | 1 | $96,420.00 | $96,420.00 | |
| Laboratory Control Technician | 1 | $96,420.00 | $96,420.00 | |
| DSS/RVSS/PVSS Head | 3 | $134,024.00 | $402,072.00 | |
| DSS Pathologist | 1 | $134,024.00 | $134,024.00 | |
| DSS Epidemiologist | 1 | $134,024.00 | $134,024.00 | |
| DSS Microbiologist | 6 | $134,024.00 | $804,144.00 | |
| DSS VMO/Microbiologist | 2 | $134,024.00 | $268,048.00 | |
| DSS QA Technician | 1 | $67,648.00 | $67,648.00 | |
| DSS Technician | 6 | $55,914.00 | $335,484.00 | |
| RVS VMO | 4 | $113,935.00 | $455,740.00 | |
| RVS Microbiologist | 6 | $113,935.00 | $683,610.00 | |
| RVS Technician 3 | 7 | $81,083.00 | $567,581.00 | |
| NAFMDVB Manager | 1 | $134,024.00 | $134,024.00 | |
| NAFMDVB Micro/Chemist | 2 | $113,935.00 | $227,870.00 | |
| PVS VMO | 1 | $113,935.00 | $113,935.00 | |
| PVS Bioinformatics | 1 | $113,935.00 | $113,935.00 | |
| PVS Microbiologist (NAHLN) | 1 | $113,935.00 | $113,935.00 | |
| PVS Microbiologist | 6 | $113,935.00 | $683,610.00 | |
| PVS Technician (NAHLN) | 3 | $81,083.00 | $243,249.00 | |
| PVS Technician | 6 | $81,083.00 | $486,498.00 | |
| FADDL Microbiologist | 1 | $113,935.00 | $113,935.00 | |
| FADDL Technician | 1 | $81,083.00 | $81,083.00 | |
| Animal Caretaker | 1 | $81,083.00 | $81,083.00 | |
| Subtotal | **71** | | **$7,332,332.00** | |

**Table 3.4.1.E1 – Staff and Salary Analysis – Plum Island, New York**

## Anticipated Salaries - Plum Island, New York

| Personnel/Position | Qty | Est. Annual Salary w/ Benefits | Total Annual Salary/Position | Comments |
|---|---|---|---|---|
| USDA-ARS | | | | |
| Laboratory Director | 1 | $200,000.00 | $200,000.00 | Based on ARS POR |
| Microbiologist | 7 | $134,024.00 | $938,168.00 | proposed facility staff |
| Epidemiologist | 1 | $134,024.00 | $134,024.00 | dated 2/11/2007 |
| Bioinformatics | 1 | $134,024.00 | $134,024.00 | |
| Immunologist | 2 | $134,024.00 | $268,048.00 | |
| Biochemist | 1 | $134,024.00 | $134,024.00 | |
| Entomologist | 2 | $134,024.00 | $268,048.00 | |
| Pathologist | 2 | $134,024.00 | $268,048.00 | |
| Cell Biologist | 1 | $134,024.00 | $134,024.00 | |
| Veterinary Clinician | 2 | $134,024.00 | $268,048.00 | |
| Post-Doctoral Fellow | 14 | $96,420.00 | $1,349,880.00 | |
| Scientific Personnel | 15 | $96,420.00 | $1,446,300.00 | |
| Administrative Personnel | 8 | $81,083.00 | $648,664.00 | |
| Visiting Scientist | 6 | $134,024.00 | $804,144.00 | |
| Visiting Scientific Personnel | 4 | $96,420.00 | $385,680.00 | |
| Visiting Post-Docs | 4 | $96,420.00 | $385,680.00 | |
| Visiting Veterinary Clinicians | 4 | $113,935.00 | $455,740.00 | |
| Visiting Research Fellows | 5 | $96,420.00 | $482,100.00 | |
| Subtotal | **80** | | **$8,704,644.00** | |
| DHS | | | | |
| Group Leader | 1 | $200,000.00 | $200,000.00 | Based on D. Brake Input |
| Direct Reports | 4 | $134,024.00 | $536,096.00 | document dated 1/10/07 |
| Staff/Direct Report | 6 | $113,935.00 | $683,610.00 | |
| Staff | 19 | $96,420.00 | $1,831,980.00 | |
| Subtotal | **30** | | **$3,251,686.00** | |
| **Totals for Staff and Annual Salaries** | **326** | | **$28,365,236.00** | |

**Table 3.4.1.E2 – Staff and Salary Analysis – Plum Island, New York**

## Anticipated Salaries - San Antonio, Texas

| Personnel/Position | Qty | Est. Annual Salary w/ Benefits | Total Annual Salary/Position | Comments |
|---|---|---|---|---|
| ***Operations & Maintenance/Security*** | | | | |
| O&M Contract Employees | 92 | $63,272.00 | $5,821,024.00 | Based on current PIADC |
| O&M Contract Manager | 1 | $137,721.00 | $137,721.00 | numbers from Charlie |
| Security Guard (Full-Time) | 10 | $83,319.00 | $833,190.00 | Wenderoth |
| Security Guard (Part-Time) | 40 | $57,457.00 | $2,298,280.00 | |
| Guard Supervisor | 1 | $99,080.00 | $99,080.00 | |
| Security Manager | 1 | $137,721.00 | $137,721.00 | |
| Subtotal | **145** | | **$9,327,016.00** | |
| ***Scientific Staff and Support*** | | | | |
| USDA-APHIS | | | | |
| Laboratory Chief | 1 | $200,000.00 | $200,000.00 | Based on APHIS |
| Secretary | 1 | $57,457.00 | $57,457.00 | Programming Questionnaire |
| Admin/Support | 1 | $46,696.00 | $46,696.00 | dated 2/20/07 |
| OAA | 1 | $117,078.00 | $117,078.00 | |
| Senior Staff Veterinarian | 1 | $137,721.00 | $137,721.00 | |
| PDS Training Specialist | 1 | $137,721.00 | $137,721.00 | |
| Quality Assurance Manager | 1 | $117,078.00 | $117,078.00 | |
| Training Technician | 1 | $99,080.00 | $99,080.00 | |
| Computer Specialist | 1 | $99,080.00 | $99,080.00 | |
| Laboratory Control Technician | 1 | $99,080.00 | $99,080.00 | |
| DSS/RVSS/PVSS Head | 3 | $137,721.00 | $413,163.00 | |
| DSS Pathologist | 1 | $137,721.00 | $137,721.00 | |
| DSS Epidemiologist | 1 | $137,721.00 | $137,721.00 | |
| DSS Microbiologist | 6 | $137,721.00 | $826,326.00 | |
| DSS VMO/Microbiologist | 2 | $137,721.00 | $275,442.00 | |
| DSS QA Technician | 1 | $69,514.00 | $69,514.00 | |
| DSS Technician | 6 | $57,457.00 | $344,742.00 | |
| RVS VMO | 4 | $117,078.00 | $468,312.00 | |
| RVS Microbiologist | 6 | $117,078.00 | $702,468.00 | |
| RVS Technician 3 | 7 | $83,319.00 | $583,233.00 | |
| NAFMDVB Manager | 1 | $137,721.00 | $137,721.00 | |
| NAFMDVB Micro/Chemist | 2 | $117,078.00 | $234,156.00 | |
| PVS VMO | 1 | $117,078.00 | $117,078.00 | |
| PVS Bioinformatics | 1 | $117,078.00 | $117,078.00 | |
| PVS Microbiologist (NAHLN) | 1 | $117,078.00 | $117,078.00 | |
| PVS Microbiologist | 6 | $117,078.00 | $702,468.00 | |
| PVS Technician (NAHLN) | 3 | $83,319.00 | $249,957.00 | |
| PVS Technician | 6 | $83,319.00 | $499,914.00 | |
| FADDL Microbiologist | 1 | $117,078.00 | $117,078.00 | |
| FADDL Technician | 1 | $83,319.00 | $83,319.00 | |
| Animal Caretaker | 1 | $83,319.00 | $83,319.00 | |
| Subtotal | **71** | | **$7,528,799.00** | |

**Table 3.4.1.F1 – Staff and Salary Analysis – San Antonio, Texas**

## Anticipated Salaries - San Antonio, Texas

| Personnel/Position | Qty | Est. Annual Salary w/ Benefits | Total Annual Salary/Position | Comments |
|---|---|---|---|---|
| USDA-ARS | | | | |
| Laboratory Director | 1 | $200,000.00 | $200,000.00 | Based on ARS POR |
| Microbiologist | 7 | $137,721.00 | $964,047.00 | proposed facility staff |
| Epidemiologist | 1 | $137,721.00 | $137,721.00 | dated 2/11/2007 |
| Bioinformatics | 1 | $137,721.00 | $137,721.00 | |
| Immunologist | 2 | $137,721.00 | $275,442.00 | |
| Biochemist | 1 | $137,721.00 | $137,721.00 | |
| Entomologist | 2 | $137,721.00 | $275,442.00 | |
| Pathologist | 2 | $137,721.00 | $275,442.00 | |
| Cell Biologist | 1 | $137,721.00 | $137,721.00 | |
| Veterinary Clinician | 2 | $137,721.00 | $275,442.00 | |
| Post-Doctoral Fellow | 14 | $99,080.00 | $1,387,120.00 | |
| Scientific Personnel | 15 | $99,080.00 | $1,486,200.00 | |
| Administrative Personnel | 8 | $83,319.00 | $666,552.00 | |
| Visiting Scientist | 6 | $137,721.00 | $826,326.00 | |
| Visiting Scientific Personnel | 4 | $99,080.00 | $396,320.00 | |
| Visiting Post-Docs | 4 | $99,080.00 | $396,320.00 | |
| Visiting Veterinary Clinicians | 4 | $117,078.00 | $468,312.00 | |
| Visiting Research Fellows | 5 | $99,080.00 | $495,400.00 | |
| Subtotal | **80** | | **$8,939,249.00** | |
| DHS | | | | |
| Group Leader | 1 | $200,000.00 | $200,000.00 | Based on D. Brake Input |
| Direct Reports | 4 | $137,721.00 | $550,884.00 | document dated 1/10/07 |
| Staff/Direct Report | 6 | $117,078.00 | $702,468.00 | |
| Staff | 19 | $99,080.00 | $1,882,520.00 | |
| Subtotal | **30** | | **$3,335,872.00** | |
| **Totals for Staff and Annual Salaries** | **326** | | **$29,130,936.00** | |

**Table 3.4.1.F2 – Staff and Salary Analysis – San Antonio, Texas**

## 3.5. SUMMARY

3.5.1. Operations & Maintenance Costs Summary - The totals indicated in the site specific tables below represent estimated operations and maintenance costs over the first eight years of operating this facility 2014 - 2022. As noted earlier under section 3.2, maintenance cost were gathered using actual costs as measured at the Canadian Science for Human and Animal Health Laboratory in Winnipeg Canada therefore no inflation factors were used over this eight year analysis. The utilities and salaries however were analyzed using anticipated costs beginning in 2014 as the baseline year and then a 2.5% annual inflation rate was applied for both over this eight year period.

**Estimated Site Specific Operations and Maintenance Summary Costs - Athens, Georgia**

| Costs | 2014/2015 | 2015/2016 | 2016/2017 | 2017/2018 | 2018/2019 | 2019/2020 | 2020/2021 | 2021/2022 | Average |
|---|---|---|---|---|---|---|---|---|---|
| Maintenance Costs | | | | | | | | | |
| Utility costs | | | | | | | | | |
| Salaries | $26,871,432 | $27,543,218 | $28,231,798 | $28,937,593 | $29,661,033 | $30,402,559 | $31,162,623 | $31,941,688 | $29,343,993 |
| Annual Totals | | | | | | | | | |

**Estimated Site Specific Operations and Maintenance Summary Costs - Manhattan, Kansas**

| Costs | 2014/2015 | 2015/2016 | 2016/2017 | 2017/2018 | 2018/2019 | 2019/2020 | 2020/2021 | 2021/2022 | Average |
|---|---|---|---|---|---|---|---|---|---|
| Maintenance Costs | | | | | | | | | |
| Utility costs | | | | | | | | | |
| Salaries | $25,099,365 | $25,726,849 | $26,370,020 | $27,029,271 | $27,705,003 | $28,397,628 | $29,107,568 | $29,835,258 | $27,408,870 |
| Annual Totals | | | | | | | | | |

**Estimated Site Specific Operations and Maintenance Summary Costs - Flora, Mississippi**

| Costs | 2014/2015 | 2015/2016 | 2016/2017 | 2017/2018 | 2018/2019 | 2019/2020 | 2020/2021 | 2021/2022 | Average |
|---|---|---|---|---|---|---|---|---|---|
| Maintenance Costs | | | | | | | | | |
| Utility costs | | | | | | | | | |
| Salaries | $25,099,365 | $25,726,849 | $26,370,020 | $27,029,271 | $27,705,003 | $28,397,628 | $29,107,568 | $29,835,258 | $27,408,870 |
| Annual Totals | | | | | | | | | |

**Estimated Site Specific Operations and Maintenance Summary Costs - Butner, North Carolina**

| Costs | 2014/2015 | 2015/2016 | 2016/2017 | 2017/2018 | 2018/2019 | 2019/2020 | 2020/2021 | 2021/2022 | Average |
|---|---|---|---|---|---|---|---|---|---|
| Maintenance Costs | | | | | | | | | |
| Utility costs | | | | | | | | | |
| Salaries | $26,662,556 | $27,329,120 | $28,012,348 | $28,712,657 | $29,430,473 | $30,166,235 | $30,920,391 | $31,693,400 | $29,115,897 |
| Annual Totals | | | | | | | | | |

**Estimated Site Specific Operations and Maintenance Summary Costs - Plum Island, New York**

| Costs | 2014/2015 | 2015/2016 | 2016/2017 | 2017/2018 | 2018/2019 | 2019/2020 | 2020/2021 | 2021/2022 | Average |
|---|---|---|---|---|---|---|---|---|---|
| Maintenance Costs | [redacted] | | | | | | | | |
| Utility costs | | | | | | | | | |
| Salaries | $28,365,236 | $29,074,367 | $29,801,226 | $30,546,257 | $31,309,913 | $32,092,661 | $32,894,977 | $33,717,352 | $30,975,249 |
| Annual Totals | $45,125,587 | $49,002,141 | $50,771,171 | $52,456,168 | $54,590,506 | $56,572,895 | $59,540,728 | $64,962,031 | $54,127,653 |

**Estimated Site Specific Operations and Maintenance Summary Costs - San Antonio, Texas**

| Costs | 2014/2015 | 2015/2016 | 2016/2017 | 2017/2018 | 2018/2019 | 2019/2020 | 2020/2021 | 2021/2022 | Average |
|---|---|---|---|---|---|---|---|---|---|
| Maintenance Costs | [redacted] | | | | | | | | |
| Utility costs | | | | | | | | | |
| Salaries | $29,130,936 | $29,859,209 | $30,605,690 | $31,370,832 | $32,155,103 | $32,958,980 | $33,782,955 | $34,627,529 | $31,811,404 |
| Annual Totals | [redacted] | | | | | | | | |

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# Section 4: Cost Benefit Analysis

## 4.1. Introduction

## Cost Benefit Analysis Matrix

## Site Concept Diagrams

# 4. COST BENEFIT ANALYSIS

## 4.1. Introduction

The following matrix, Table 4.1, is a summary which represents non monetary benefits and challenges found at each of the six sites using the same criteria to evaluate the NBAF program. This Matrix will analyze and evaluate related site benefits and challenges, then provide a comparison against each of the six sites being evaluated. Consequences for each of these benefits and challenges can also be determined to further analysis the impact against the NBAF program.

For general summary information, the Project Estimate has been included within the matrix. Reference Section 2.3.7 - Site Specific Costs & Quantity Tables for an explanation of what these costs represent and how they were determined.

## 4.2. Site Concept Diagrams

Copies of the site concept diagrams have been included under this section of the report for informational purposes to support the findings presented in this analysis.

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| CRITERIA | Athens, GA | Manhattan, KS | Flora, MS | Butner, NC | Plum Island, NY | San Antonio, TX |
|---|---|---|---|---|---|---|
| | Comments | Comments | Comments | Comments | Comments | Comments |
| **1. Site Fit** | | | | | | |
| Physical Boundries | The subject property is bound by the Athens Perimeter (Loop 10) to the north, Oconee County to the west and south, and the North Oconee River to the east. The subject property is located approximately in the center of this geographical area.Initial program will fit w/ significant earthwork due to grade change across the site. | Initial program is a very tight fit w/ significant earthwork due to grade change across the site. | Initial program will fit w/ modest earthwork due to minimal grade change across the site. There is a pond on the site along with a possible detention pond. | Initial program will fit w/ significant earthwork due to grade change across the site. | Initial program will fit w/ significant earthwork due to lack of adequate grade change across the site. | Initial program will fit w/ significant earthwork due to grade change across the site. |
| Initial size | Approximately 67 Acres | Approximately 45 Acres | Approximately 150 Acres | Approximately 249 Acres | Approximate acres N/A | Approximately 100 Acres |
| Site Concerns | | | The topography of the site slopes down to the east and the bordering railroad. There is a mainline Illinois Central railroad running along the east property boundary. This railroad has a potential for a derailment and spill of hazardous or toxic materials. The west border of the property is adjacent to U.S. Highway 49, which is four lane and carries trucks which contain hazardous or toxic materials. A collision or wreck of one of these trucks could cause a spill which would flow onto the site. | It must be pointed out that Butner is a state-owned property. Its manager, Tom McGhee, is an employee of the NC Department of Health and Human Services. As a result, the true jurisdiction for the property is the state of North Carolina. | | |
| **2. Transportation** | | | | | | |
| Public Transportation | The main method of transportation in the Clarke County area is surface transportation. There are U.S. and state highways, primary neighborhood commercial thoroughfares and secondary roads and streets located within and through the subject neighborhood. Rail transportation is available; both CSX and Norfolk Southern service the Athens area. Athens-Ben Epps Municipal Airport is located approximately 6 miles from the subject property. The Subject property is not served by public transportation. | Manhattan Regional Airport is a commercial service airport. It is also capable of accommodating large military and commercial transport aircraft. Surface Transportation. Public Transportation information not available at the time of this report | The proposed site is adjacent to U.S. Route 49, a major four-lane divided highway. It is connected via major highways Interstate 55 (approximately 17 miles), which supports north/south interstate traffic, and to Interstate 20 (approximately 20 miles), which supports east/west interstate traffic. The Jackson-Evers International Airport, which links with the nation's major air hubs, is 45 miles from the site. Rail is accessible on-site. Surface Transportation. | A major interstate highway (Interstate 85) is within three miles of the site, and connects with Interstates 40 and 95. Service spurs for the Norfolk-Southern Railroad exist in Butner, approximately three miles south. The Raleigh-Durham International airport is less than 25 miles away, and the Piedmont-Triad International airport is just over an hour drive from the proposed site. Surface Transportation. | The proposed site is on an Island. Only government ferries are allowed. Major Airports are located with New York State. New York State has Public Transportation System as well as surface transportation. | Transportation arteries are adjacent and nearby the TRP and the alternative site. The TRP fronts on State Highway 211 (Texas Research Parkway). To the south, State Highway 211 connects to U.S. Highway 90 approximately two miles from the TRP. To the north, State Highway 211 insects with State Highway 1957 (Potranco Road) and will be extended northward within four years to connect to the northwest segment of State Highway 211. |
| | | | The subject property is within 500 miles or less from 76 major metropolitan areas | | | |
| **3. Security Set Backs & Code Issues** | | | | | | |
| [redacted] | | | | | | |
| **4. Constructability** | | | | | | |
| Earthwork | Substantial earthwork due to amount of topography. | Substantial earthwork due to amount of topography. | Modest earthwork required due to gradual topography. | Substantial earthwork due to amount of topography. | Relatively flat site causes substantial soil to be removed to construct the basement. | Substantial earthwork due to amount of topography. |
| **5. Logistics** | | | | | | |
| Speed of Delivery | Nothing to slow construction. | Limited site area may impact construction. | Nothing to slow construction. | Remoteness of site may impact construction. | Remoteness of site on an island will impact construction. Access to both materials and labor will be a challenge. | Nothing to slow construction. |
| **6. Taxes** | | | | | | |
| Genral Notes | The subject property is tax exempt. Any tax-appraised fair market value estimate of the subject property by Athens-Clarke County is not applicable. | Information not available at the time of this report | Information not available at the time of this report | Information not available at the time of this report | Information not available at the time of this report | Information not available at the time of this report |
| Property | Property taxes are determined by tax rates and assessment ratios which vary by location. | Information not available at the time of this report | Information not available at the time of this report | Information not available at the time of this report | Information not available at the time of this report | Information not available at the time of this report |
| Sales | Athens-Clarke County has 3% local sales tax in addition to the 4% state sales tax. | Tax rate will change from 7.80% to 7.30% | Tax rate will change from 7.0% | Information not available at the time of this report | Information not available at the time of this report | Information not available at the time of this report |
| **7. Infrastructure** | | | | | | |
| Roadways | Existing municipal roadways will be adequate. | Denison Ave and Kimball Ave are the only two paved roads which access the site. | Existing municipal roadways will be adequate. | Existing municipal roadways will be adequate however an extensive site entry drive will be required. The entry road will be fed off of Range road which is a two lane county road with minimal traffic. | Existing roadways will be adequate. | Existing municipal roadways will be adequate. |
| **8. Cost Factors** | | | | | | |
| | 0.95 | 0.97 | 0.90 | 0.95 | 1.32 | 0.90 |
| **9. Total Project Estimate** | | | | | | |
| See Section 2.3.7 for details | $679,965,515 | $724,551,494 | $648,229,703 | $677,289,729 | $939,326,684 | $652,377,478 |

Table 4.1 – Site Benefit Analysis Matrix

Table 4.1 – Site Benefit Analysis Matrix

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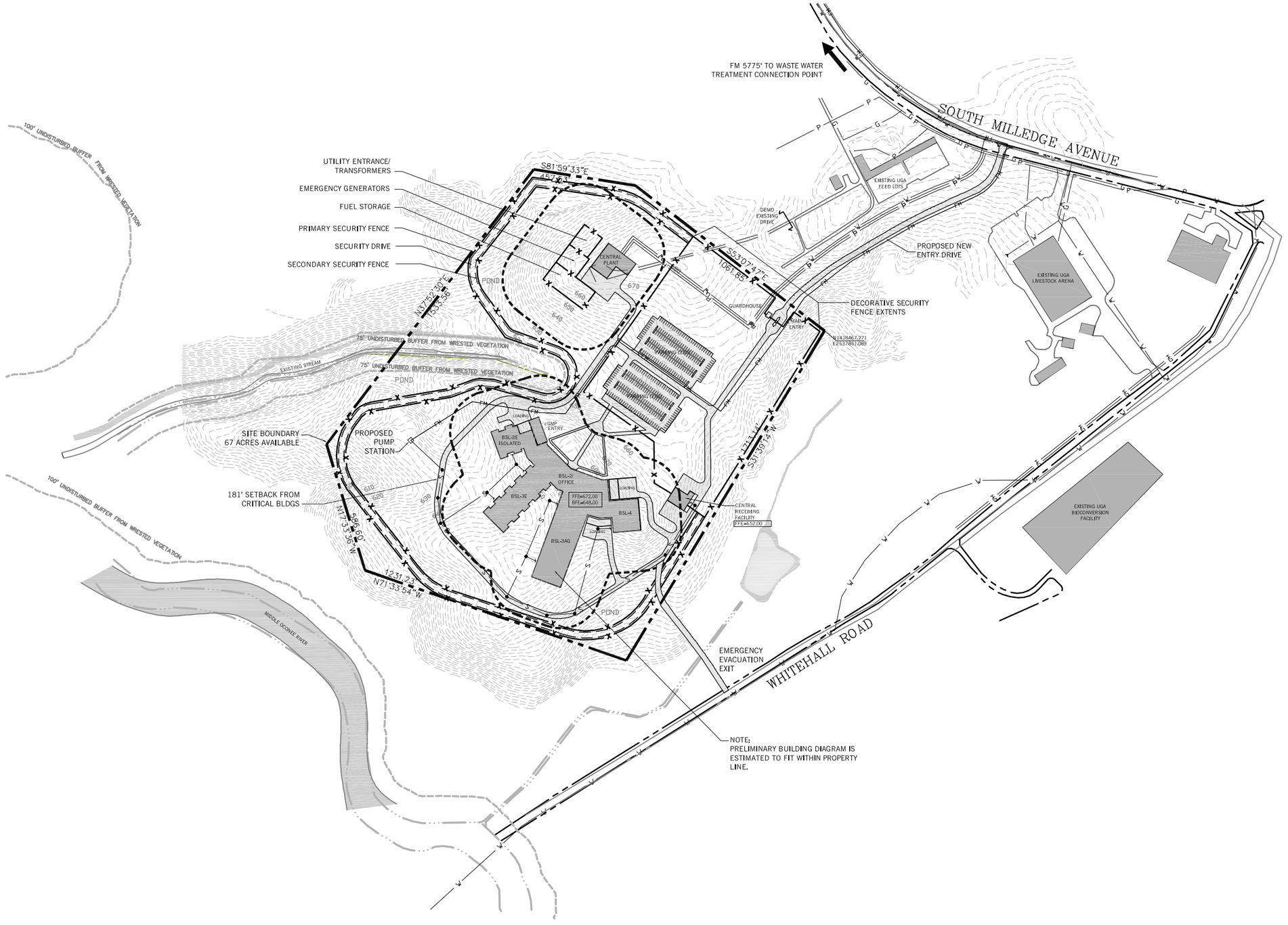
**CUT & FILL ANALYSIS**
**CUT= 292,678 CY**
**FILL= 254,840 CY**
**NET= 37,838 CY CUT**

**NOTE: SHRINKAGE AND TOP SOIL NOT ACCOUNTED FOR**




NORTH

NBAF Design Partnership

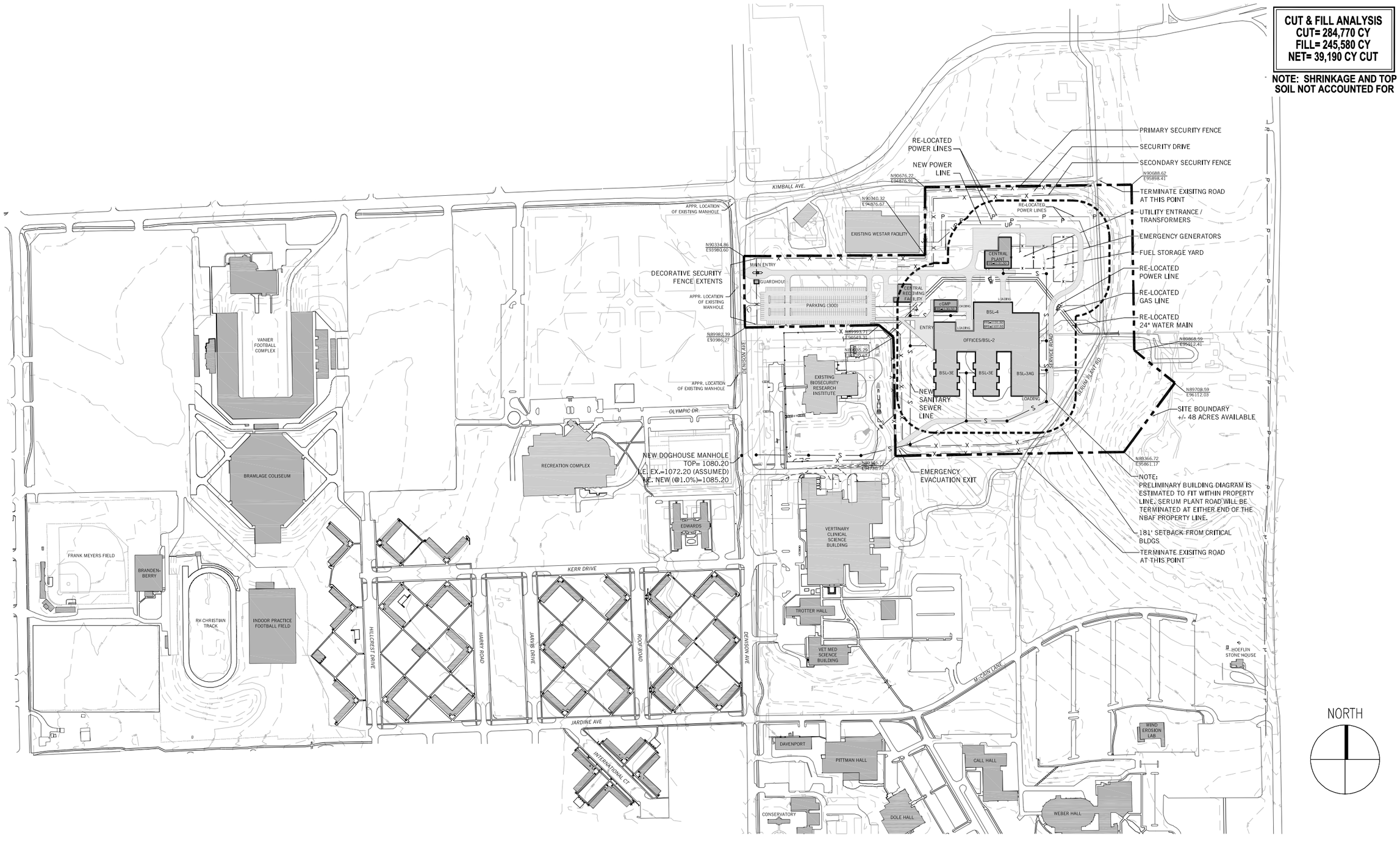
# PROPOSED GEORGIA SITE
# SITE CONCEPT DIAGRAM

July 25, 2008
SCALE: 1" = 200'-0"

GRAPHIC SCALE – IN FEET
100 0 200 400 600 800

P:\Atlanta\800620.000_NBAF\DOCS\01.0-PredesignPlanProg\01.04-ReportOriginals\NBAF Site CAD Backgrounds\GA\GA_Prelim_Site 7-25-08.dwg

DRWN BY: DR CHKD BY: AGB JN: 1-07-0644 CN: GA_PRELIM_SITE 7-25-08 FN: 151-D-041




NBAF Design Partnership

# PROPOSED KANSAS SITE
# SITE CONCEPT DIAGRAM

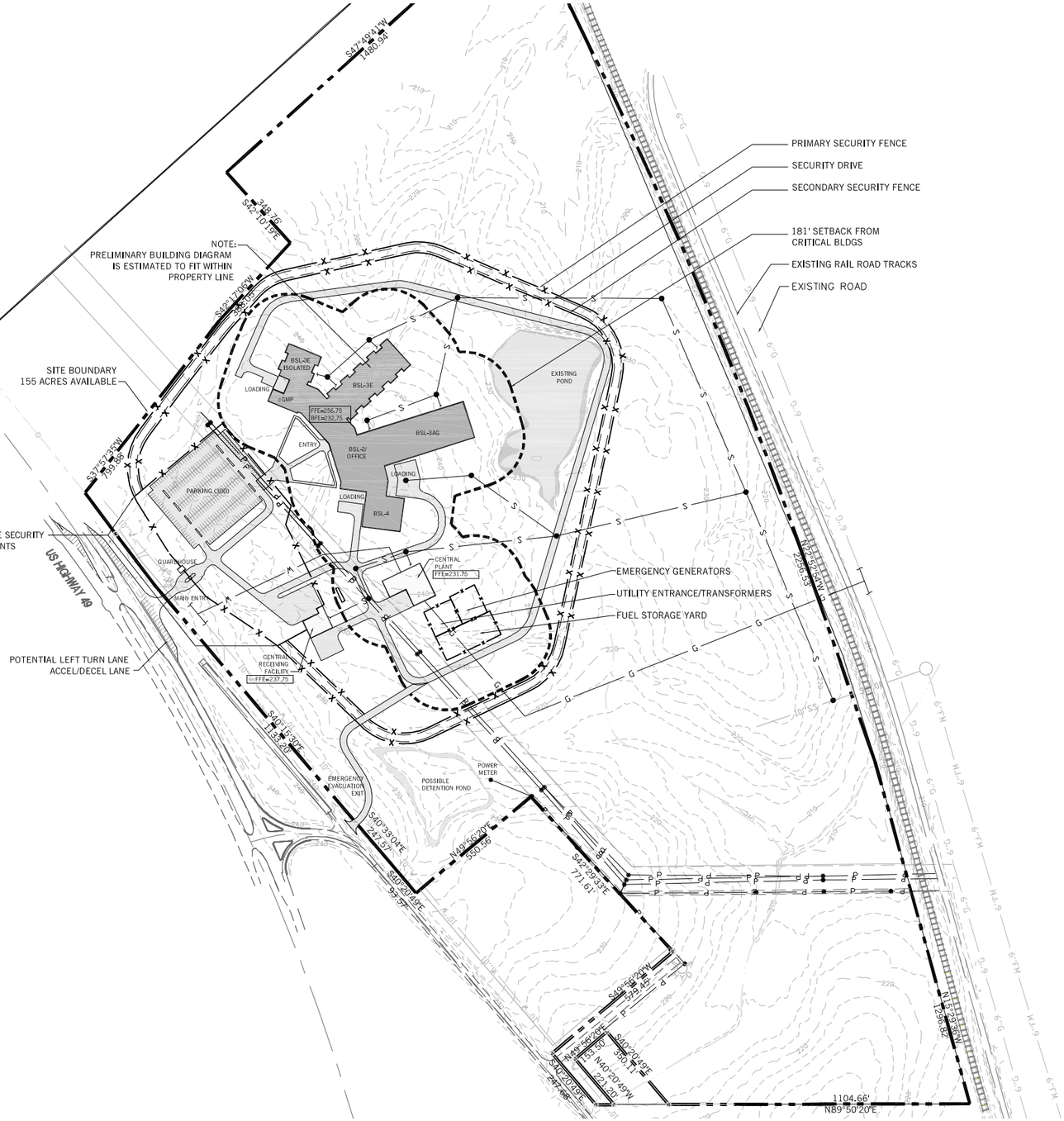
July 25, 2008
SCALE: 1" = 200'-0"
GRAPHIC SCALE – IN FEET
50 0 100 200 300 400

P:\Atlanta\800620.000_NBAF\DOCS\01.0-PredesignPlanProg\01.04-ReportOriginals\NBAF Site CAD Backgrounds\KS\KS_Prelim_Site 7-25-08.dwg

DRWN BY:DR CHKD BY:AGB JN:1-07-0645 CN:KS_PRELIM_SITE 7-25-08 FN:151-D-042

**CUT & FILL ANALYSIS**
**CUT= 166,089 CY**
**FILL= 137,176 CY**
**NET= 28,913 CY FILL**

**NOTE: SHRINKAGE AND TOP SOIL NOT ACCOUNTED FOR**




NORTH

# PROPOSED MISSISSIPPI SITE SITE CONCEPT DIAGRAM

NBAF Design Partnership

July 25, 2008
SCALE: 1" = 200'-0"

GRAPHIC SCALE – IN FEET
100 0 200 400 600 800

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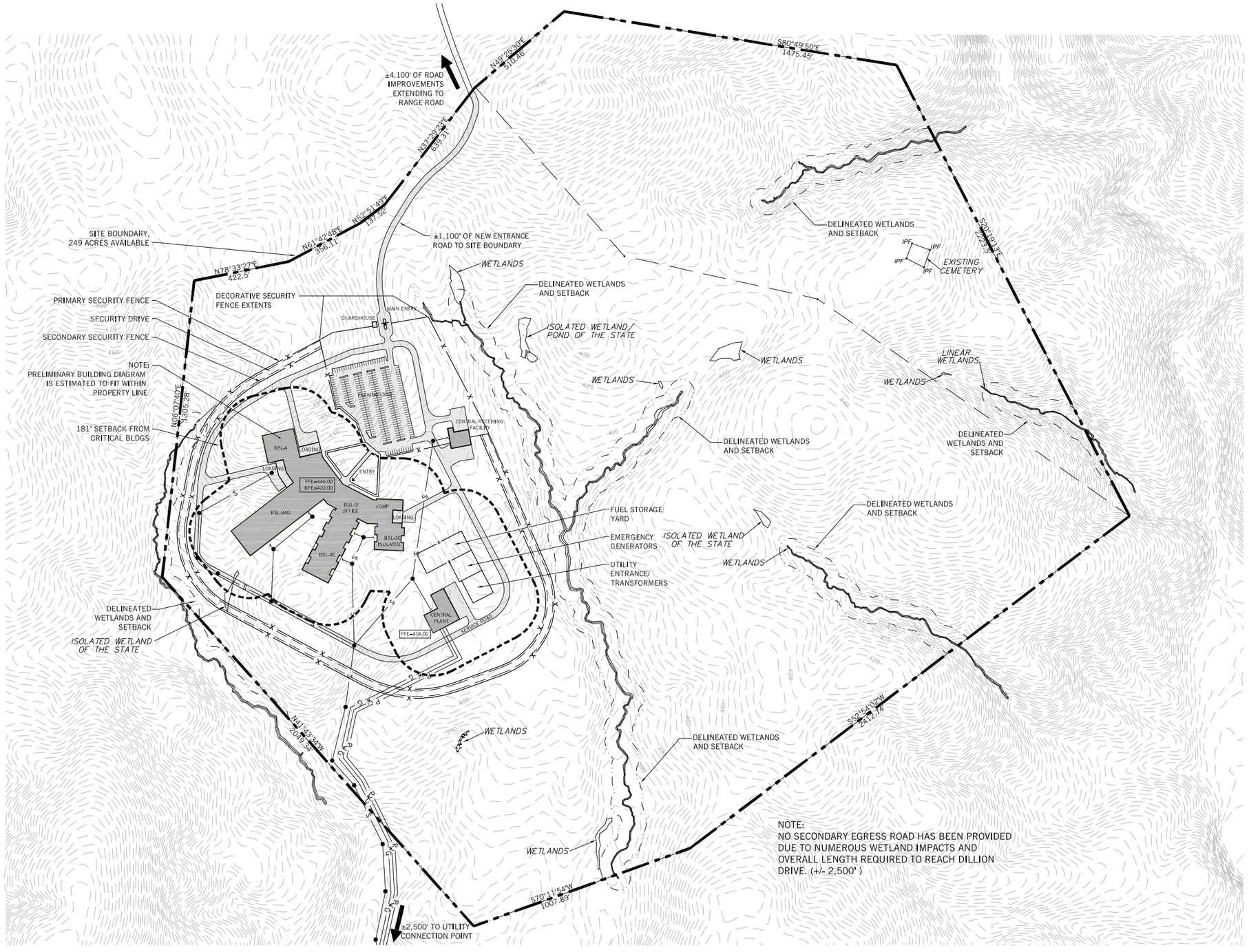
DRWN BY: DR CHKD BY: AGB JN: 1-07-0646 CN: MS_PRELIM_SITE 7-25-08 FN: 151-D-043

**CUT & FILL ANALYSIS**
**CUT= 244,235 CY**
**FILL= 216,701 CY**
**NET= 27,534 CY FILL**

**NOTE: SHRINKAGE AND TOP SOIL NOT ACCOUNTED FOR**




NBAF Design Partnership

# PROPOSED NORTH CAROLINA SITE SITE CONCEPT DIAGRAM

July 25, 2008
SCALE: 1" = 200'-0"

GRAPHIC SCALE – IN FEET
100 0 200 400 600 800

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DRWN BY:DR CHKD BY:AGB JN:1-07-0648 CN:NC_PRELIM_SITE 7-25-08 FN:151-D-045

**CUT & FILL ANALYSIS**
**CUT= 264,544 CY**
**FILL= 49,242 CY**
**NET= 215,303 CY CUT**

**NOTE: SHRINKAGE AND TOP SOIL NOT ACCOUNTED FOR**

PROPOSED NEW WATER TOWER

181' SETBACK FROM CRITICAL BUILDINGS

SECURITY FENCE

PUMP STATION

EXISTING ROUTE

EXISTING PIERS

EXISTING CENTRAL PLANT

EXISTING BUILDING

EXISTING BUILDING

NEW CENTRAL PLANT

BSL-3AG

BSL-3E

BSL-4

BSL-2/ OFFICE

LOADING

ENTRY

GMP

BSL-3E ISOLATED

SKIN

CENTRAL PLANT

EXISTING WASTE TREATMENT FACILITY

PROPOSED WASTE TREATMENT FACILITY

NOTE:
WASTE TREATMENT FACILITY SIZE AND LOCATION TO BE DETERMINED UPON FINAL DESIGN.

ENTRY DRIVE FROM FERRY

OSPREY NESTING SITE (TYPICAL)

FUEL OIL PIPELINE

WETLANDS

WETLANDS

SEWAGE PUMP STATION

SEWAGE PUMP SUBSTATION

WAREHOUSE

SUBSTATION

PANELBOARD

FUEL PUMP AREA

RANGE LIGHTS

PULLBOX

NEW DOCK RAMP

POLE 10D

POLE 10E STRUCTURE

PLUM ISLAND HARBOR

NORTH

NBAF Design Partnership

# PROPOSED
# PLUM ISLAND SITE
# SITE CONCEPT DIAGRAM

P:\Atlanta\800620.000_NBAF\DOCS\01.0-PredesignPlanProg\01.04-ReportOriginals\NBAF Site CAD Backgrounds\NY\NY_Prelim_Site 7-25-08.dwg

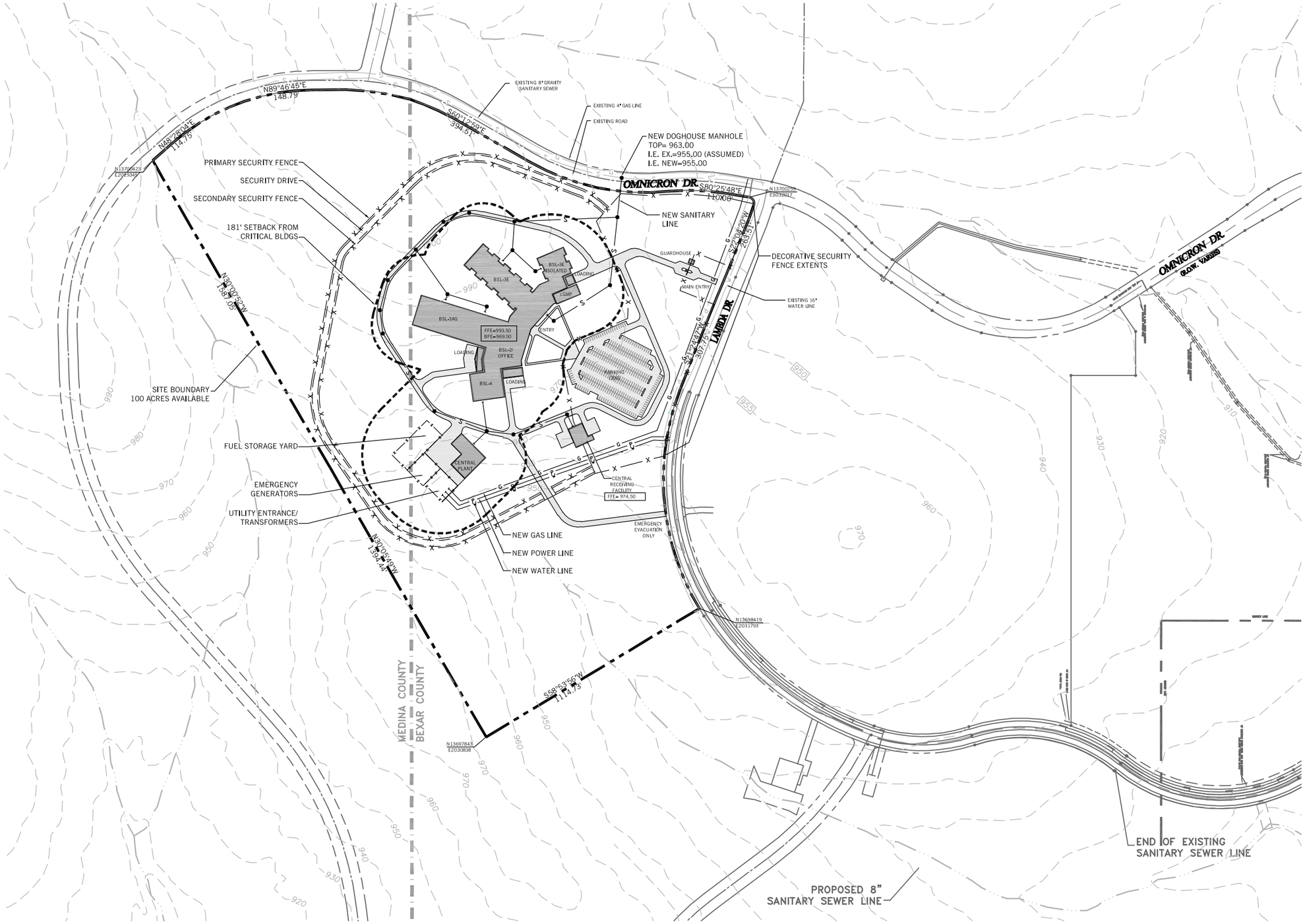
July 25, 2008
SCALE: 1" = 200'-0"

GRAPHIC SCALE — IN FEET
50 0 100 200 300 400

DRWN BY:DR CHKD BY:AGB JN:1-07-0647 CN:NY_PRELIM_SITE 7-25-08 FN:151-D-044

**CUT & FILL ANALYSIS**
**CUT= 324,900 CY**
**FILL= 277,165 CY**
**NET= 47,735 CY FILL**

**NOTE: SHRINKAGE AND TOP SOIL NOT ACCOUNTED FOR**




NBAF Design Partnership

# PROPOSED TEXAS SITE SITE CONCEPT DIAGRAM

P:\Atlanta\800620.000_NBAF\DOCS\01.0-PredesignPlanProg\01.04-ReportOriginals\NBAF Site CAD Backgrounds\TX\TX_Prelim_Site 7-25-08.dwg

July 25, 2008
SCALE: 1" = 200'-0"

GRAPHIC SCALE – IN FEET
100 0 200 400 600 800

DRWN BY:DR CHKD BY:AGB JN:1-07-0649 CN:TX_PRELIM_SITE 7-25-08 FN:151-0-046

# Section 5: Summary

## 5. SUMMARY

### 5.1. Closing

The goal of the report is to analyze each the alternative sites to determine the factors and effects and then quantify and express them in dollar amounts. DHS' goal is to minimize the construction, infrastructure and operating costs of the NBAF. The Site Cost Analysis will present the final evaluation of each alternative including all estimated costs. The goal is to minimize the cost while meeting the mission of the NBAF.

This report does not present any recommendations but rather provide any findings with anticipated implications.

In summary, the aggregate of the anticipated site specific costs as analyzed is inclusive of the following four major categories:

- Project Costs - This includes the construction estimate costs, escalation, contingencies and fees.
- Systems Maintenance – This includes all maintenance related costs, both material and or contract costs, to support the NBAF facility. These costs have been adjusted using the site specific area adjustment factors. No annual escalation was used as the original costs were gathered from actual maintenance costs over this eight year period.
- Utility Costs – This includes the anticipated utility consumption based on the preliminary NBAF program. These costs were calculated using the estimated facility loads multiplied using the utility rates as provided by each site consortia and then escalated at 2.5% annually over an eight year period.
- Salaries – This includes all salaries related to the estimated personnel that would be working within the NBAF facilities. These costs were calculated using the published government site specific salaries then escalated at 2.5% annually over an eight year period. No site adjustment factor was used as the published site specific government rates already account for regional factors.

The itemized project summary costs can be found in section 2, table 2.3.7.2. The Operations & Maintenance summary costs can be found in the tables within section 3.5.

| Cost Category | GA | KS | MS | NC | NY | TX |
|---|---|---|---|---|---|---|
| Construction Estimate | $525,846,429 | $563,009,934 | $497,998,475 | $523,711,811 | $752,474,897 | $501,734,260 |
| Maintenance Costs | $10,145,744 | $10,359,339 | $9,611,758 | $10,145,744 | $14,097,244 | $9,611,758 |
| Utility Costs | $7,566,180 | $6,758,870 | $7,849,037 | $8,809,375 | $9,055,160 | $7,231,148 |
| Salaries | $29,343,993 | $27,408,870 | $27,408,870 | $29,115,897 | $30,975,249 | $31,811,404 |

Note:

1. The maintenance, utility and salary costs represent an average annual cost taken from the estimates of these costs over the initial eight years of operation as projected in the site cost analysis.

Table 5.1 Site Cost Summary

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