

# Executive Summary

## Background

In collaboration with Virginia Tech, AECOM conducted a planning study to evaluate the feasibility of relocating the Hampton Roads Agricultural Research and Extension Center (HR AREC) to alternative sites currently owned by the City of Virginia Beach. The study provides guidance on the time and cost required to create an equivalent replacement of the existing facility at a new location that would be developed according to current regulatory requirements.

Key to the study is an assessment of the specific soil, landmass, and infrastructure characteristics necessary to support the unique types of nursery crop and turf grass research currently conducted at the existing HR AREC campus.

## Existing Facilities

The HR AREC consists of 16 buildings comprising approximately 59,000 gross square feet of built space as well as numerous constructed site support elements. The facility types include a large multi-story building (that contains labs, classrooms and office spaces), greenhouses, and small agricultural sheds. The basis of analysis for this study assumes a 'like-in-kind' replacement of all the buildings and structures.

## Existing Site Conditions

The HR AREC currently utilizes approximately 71 acres in Virginia Beach; 58 acres have been leased from the City of Virginia Beach since 1920. The land is comprised of high-quality soil with excellent drainage and irrigation characteristics. Due to its average elevation of 25 feet above mean sea level and relatively flat topography with low water table, it is not subject to rain-event flooding or sea level rise. The soil quality, elevation, drainage, and irrigation infrastructure are key to successful research activities at the existing site.

## Site Options Process

Due to time constraints, this study was limited to sites currently owned by Virginia Beach that provide a minimum of 71 contiguous acres. Three potential sites were identified at the beginning of the study; however, one site was quickly eliminated as it was in the process of being contracted for sale.

The two remaining sites are the Brown Farm and the Brenneman Farm, both located along North Landing Road. The Brown Farm was studied as two distinct parcels because future extension of the Nimmo Parkway is expected to bifurcate the farm. The report labels these as Brown Farm North and Brown Farm South. Thus, three sites were evaluated as part of this study to develop an understanding of the requirements and costs to relocate HR AREC.

## Land Development Considerations

To ensure a comprehensive review of soil and regulatory requirements, AECOM obtained the services of a nationally renowned soils scientist who conducted a preliminary soils analysis of the existing and alternate sites.

Two critical land development components identified by the soils consultant and AECOM are (1) the establishment of the appropriate soil drainage, and (2) an engineered buffer zone.

## Drainage

Soils are arrayed into seven classifications for drainage adequacy. The soils at the existing HR AREC are classified as "well-drained," typical of upland soils with deep water tables which are ideal for the growth of turf grass and nursery crops.

The Brenneman Farm and Brown Farm primarily grow soybean and corn crops. The soils at both farms have water near or at the surface year-round and as such are classified as "poorly-drained."

While the three alternate sites are currently well-suited for corn and soybean production given the high moisture content of their existing soil, those soil conditions would be harmful to the types of research plants grown at HR AREC.

The soil conditions at the alternate sites would require significant enhancements to establish the drainage characteristics necessary to support the HR AREC's research activities. The essential enhancements would include (1) construction of drainage and irrigation infrastructure and (2) addition of significant engineered soil material (ranging from 1 to 4 feet deep) to elevate plant roots above the water table.

### **Engineered Buffer Zone**

The existing site has been developed over an approximately 100 year period and operates under grandfathered regulatory requirements. Current permitting and land use requirements dictate the need for a separation zone between the research center and adjacent parcels. The construction of a new AREC at an alternate site will require establishment of an engineered buffer zone surrounding its entire perimeter to meet current regulatory requirements. This 100-ft wide area would be based on National Forest Services guidance for width and composition and would contain features established under Virginia stormwater best management practices.

The engineered buffer zone serves three required functions:

1. Compliance with current stormwater management regulations,
2. Ensure rainwater and irrigation run-off is retained on site to preclude infiltration of research-related spillover onto adjacent non-HR AREC parcels, and
3. Preclude infiltration of surface/groundwater from adjacent parcels onto the HR AREC property that could negatively influence research efforts.

The existing AREC encompasses 71 acres of used land but does not include an engineered buffer zone. Establishment of a new AREC will require a larger area to accommodate the engineered buffer zone while maintaining an equivalent program acreage. The additional land area required for the three sites studied varies between 7 to 15 percent dependent upon configuration and natural assets of a particular site.

### **Timeline**

Based upon the following assumptions, the total anticipated time to relocate the HR AREC would not exceed 66 months (approximately five and one-half years):

- Project effective date of July 1, 2023
- "Non-pool" capital funding
- Site approval and acquisition from the City completed within one year of project effective date
- Design duration of eighteen months
- Construction contract procurement and permitting duration of six months
- Total construction duration of thirty-six months

Under these assumptions, the HR AREC would vacate the current site by December 31, 2028.

The timeline has the potential to be reduced depending on (1) the actual time to acquire the property, (2) the actual construction procurement method, and (3) the actual intensity of land development required to achieve the necessary soil drainage and buffer zone.

The timeline includes a transition period for the research program which would begin one year into the three-year construction period and would conclude upon completion of construction. Because of the nature of the soil-based research, projects would not transplant to the new location. Rather, research activity will terminate over a two-year period at the existing site while new research is initiated at a new site.

A brief list of key schedule points for the capital project and the transition of the research program are shown below and shown graphically in Table 1.

#### **Capital Project Timeline:**

1. July 1, 2023 - Project effective date
2. July 2024 - Site acquisition complete
3. July 2025 - Design complete
4. December 2025 - Construction contract procurement complete
5. July 2027 - Construction of buildings complete
6. December 2028 - Land development complete

#### **Research Program Transition Timeline:**

1. December 2026 - Research begins transition to new site.
2. December 2028 - Program terminates at existing site.

## Cost

Total project costs for each site evaluated are shown below in Table 2: Cost Evaluation of the Three Sites. These costs are not based on a design but are parametric estimates which provide reasonable rough order of magnitude (ROM) costs for buildings, land development, and transitioning the research program to a new location. A dedicated cost narrative is provided later in this report detailing how anticipated costs were developed and estimated.

A list of key assumptions and considerations related to costs are shown below:

1. The report reflects 2022 Q4 dollars and would need to be escalated.
2. The report assumes the City of Virginia Beach will provide the required infrastructure services (road network, power, water, sewer, data, etc.) to a selected site. Thus, these costs are not included in the report.
3. The land development costs reflect establishing soil drainage and buffer zone requirements for the entire acreage of each alternative site, and each site is larger than the existing HR AREC location. Once a site is selected and the actual buffer zone requirements are known, the costs for the land development could be controlled by developing only what is necessary to support the existing 71-acre program. This would leave some acreage undeveloped and available for the future.

## Limitations of this Study

- 1. Extent of Soil Analyses:** The soil analysis conducted was sufficient for the purposes of this study in determining approximate time and cost that would be required to relocate the HR AREC. However, this preliminary soil analysis and other contents in this study should be considered a preliminary due diligence effort and not the final analysis for the purposes of selecting the optimal new site for the HR AREC. The next stage of work should carefully define the site's drainage and soil hydrologic conditions and any regulatory complications from potential wetland jurisdictional questions. During the final due diligence effort, it will be necessary to engage the City of Virginia Beach and other stakeholders prior to finalization of site selection.
- 2. Groundwater Level Analyses:** Groundwater levels were reported per available GIS data. Groundwater data should be validated using onsite testing as part of the final due diligence at the next stage.
- 3. Using 1:1 Replacements for Existing Buildings:** The like-in-kind basis for this analysis provided an

appropriately conservative assessment of the facilities required to support the program activities. During a formal design process, programming effort would likely identify opportunities for efficiencies that may improve operations and the scope of buildings required for the operations.

## Additional Alternative Site Locations

Additional time for a more exhaustive search for potential parcels, either commercially available or owned by Virginia Beach, may realize cost avoidance opportunities. These alternatives would still include the need for buildings (estimated at approximately \$32M), and possible acquisition costs, however, savings may be generated if other locations would require less intense soil improvements and infrastructure requirements. For example, golf courses may have the type of soil, improved drainage requirements, stormwater collection, and some of the irrigation that would optimize a newly established HR AREC.

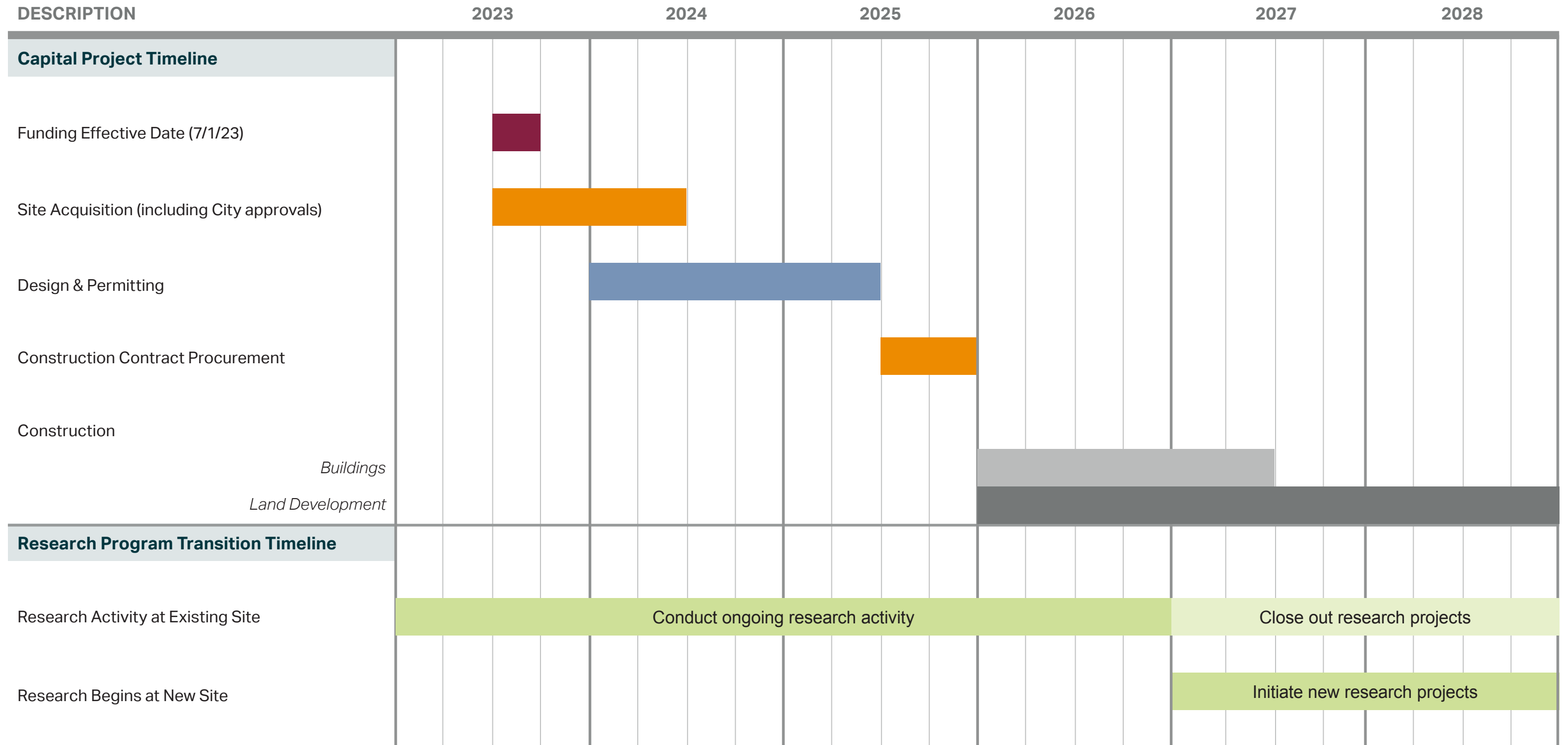
## Conclusion

This study demonstrates the requirements and costs to effectually relocate the HR AREC to alternate sites owned by the City of Virginia Beach, and it highlights two material considerations.

First, the study shows the significant work and costs that would be required to replicate the soil conditions and to establish a buffer zone in accordance with regulatory requirements for a new site.

Second, the study shows that active ground soil research projects are generally not transferable to a new location. Rather, ongoing projects will need to be phased out and terminated while simultaneously initiating new research work at a new location. Thus, the HR AREC would temporarily require some redundant equipment and labor during an approximately two-year transition period, which is included in the total project costs for land development.

**Table 1. Project Schedule**



## Table 2. Cost Evaluation of the Three Sites

### Parametric Cost Estimates

Costs in 2022 Q4 Dollars

(Dollars in Millions)

	<b>Site 1</b> <b>Brenneman Farm</b>	<b>Site 2</b> <b>Brown Farm North</b>	<b>Site 3</b> <b>Brown Farm South</b>
	<b>88.5 acres</b>	<b>109.00 acres</b>	<b>118.00 acres</b>
			
<b>Capital Projects Costs <sup>(1)</sup>:</b>			
Buildings	\$32	\$32	\$32
Land Development <sup>(2)</sup>	\$74	\$70	\$87
<b>Total Capital Project Costs</b>	<b>\$106</b>	<b>\$102</b>	<b>\$119</b>

#### NOTES:

(1) The costs assume the City of Virginia Beach will provide the required infrastructure services (road network, power, water, sewer, data, etc.) to a selected site.

(2) The land development costs reflect establishing soil drainage and buffer zone requirements for the entire acreage of each alternative site, and each site is larger than the existing HR AREC location. Once a site is selected and the actual buffer zone requirements are known, the costs for the land development could be controlled by developing only what is necessary to support the existing 71-acre program. This would leave some acreage undeveloped and available for the future.