GO VIRGINIA REGION 6: MARY BALL WASHINGTON SITE ASSESMENTS REPORT

Fredericksburg Regional Alliance at the University of Mary Washington

Northern Neck Planning District Commission

Middle Peninsula Planning District Commission

PREPARED FOR:

Mr. Neal J. Barber, President
Community Futures
Locust Hill, VA 23092
Phone 804.758.0640

September 15, 2017

Draper Aden Associates
Engineering • Surveying • Environmental Services

DAA Project Number: **17010548-01**

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September 15, 2017

Mr. Neal J. Barber, President
Community Futures
Locust Hill, VA 23092

RE: GO Virginia Region 6
Sites Assessments Report
Draper Aden Associates Project No.17010548-01

Dear Mr. Barber:

Draper Aden Associates has completed the Region 6 Site Assessments Report. The objective of this study was to assist with the development of the Economic Growth and Diversification Plan (EGD Plan) for GO Virginia Region 6.

We value our professional relationship with Community Futures, and hope that you will contact us with any similar needs in the future. If you have any questions regarding this report, or if we can be of any further service to you please do not hesitate to contact us.

Sincerely,
Draper Aden Associates

Carolyn A. Howard

Carolyn A. Howard, PE
Vice President / Regional Manger
Site Development and Infrastructure

cc: Ms. Deborah K. Flippo, Associate / Economic Development Manager, Draper Aden Associates
Ms. Johanna M. Vaughan, Draper Aden Associates

This Report has been subjected to technical and quality reviews by:

		09/15/2017
Name: Johanna M. Vaughan	Signature	Date
		09/15/2017
Name: Carolyn A. Howard, PE	Signature	Date

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1.0 EXECUTIVE SUMMARY

The Mary Ball Washington Region (GO Virginia Region 6) has approximately 63 sites (as per Virginia Scan) with over 15 acres available for commercial / industrial development. The sites are at various levels of site-readiness for development, and compatibility with the Region 6 targeted sectors: Natural resource-based industries, manufacturing, distribution/logistics, data centers, finance and insurance, and professional services (defense/security, home based businesses, and research commercialization). The Caroline Commerce Center is the primary site in the Region with over 100 acres that has all infrastructure available for each target sectors. Refer to Section 2.0 for the results of our findings.

Additionally, Region 6 selected the following sites to provide supplementary review of the compatibility with the Region 6 targeted industries and sectors, and a Virginia Business Ready Sites Program (VBRSP) Site Characterization Tier Level for each site, including order of magnitude estimates of probable construction costs to achieve the next and final Tier Levels.

1. Caroline County - Ladysmith Supersite
2. Gloucester County – Page Middle School Site
3. King & Queen County – West Point Airport
4. Richmond County Commerce Park
5. Spotsylvania County - Webster 140
6. Stafford County - Venture Business Park

2.0 COMPATABILITY WITH TARGETED INDUSTRIES & SECTORS

2.1 Targeted Industries and Sectors

The target industries and sectors for Region 6 are natural resource-based industries, manufacturing, distribution/logistics, data centers, finance and insurance, and professional services (defense/security, home based businesses, and research commercialization). Site characteristics that are critical to attracting specific target industries and sectors are noted below.

A. Proximity to interstates and 4-lane limited access highways: Distribution/logistics and other selected industries and sectors.

B. Availability and redundancy of electric and fiber service: Data centers and selected manufacturing, finance and insurance, and defense/security services.

C. Availability of sewer and water: All target industries and sectors. Note: If the available information provided stated that sewer and water was not currently available at the site, but is available to be extended to the site, determination of suitability was not impacted. However, a few sites, particularly in the Middle Peninsula and Northern Neck regions, have only well and septic available; this effected negatively towards the determination of site suitability.

D. Availability of gas: Most target industries and sectors. Note: If the available information provided stated that gas was not currently available at the site, but is available to be extended to the site, determination of suitability was not impacted.

E. Adjacency to waterbodies: Natural resource-based industries (seafood, aquaculture, commercial fishing, wood products, marine research, and resiliency/marine construction).

F. Large sites (greater than 100 acres): Data centers, selected distribution/logistics, and selected manufacturing.

G. Buffer areas for secure sites: Data centers and defense/security services.

H. Low risk from man-made and/or natural disasters: Data centers and defense/security services.

I. Compatible adjacent land uses: All targets and sectors.

2.2 Virginia Scan Parcels

Draper Aden Associates reviewed 63 sites (15 acres or greater) on Virginia Scan and related readily available information, and compared the existing site characteristics with the major factors for site suitability required for the targeted industries and sectors. The results of our findings are summarized below and in Appendix A – Mary Ball Washington Region VA Scan Sites Assessments Summary.

A. There are 40 sites within 5 miles of an interstate providing easy access for employees and transportation of goods and services; however, 19 of these sites do not have utilities within close proximity, and many are ungraded.

B. Of the 26 parcels with the largest contiguous are over 100 acres, approximately 5 have infrastructure at or adjacent to the site, which reduces the Region's ability to provide large-scale "building ready" sites within a 12-month timeframe. Additionally, 38 of the 63 sites had 0 to 1 utilities currently available on or immediately adjacent to the site.

C. Availability of fiber is critical to many sectors; only 16 sites currently have fiber available, and of these, only a few have redundant service. Redundant service is critical for data centers and selected defense/security services.

D. Approximately 11 sites have rail adjacent to the site.

E. Middle Peninsula and Northern Neck sites are not conducive for data centers and selected defense and security services due to a high risk of natural disasters. However, the site's remoteness and proximity to DC and major military bases makes them attractive to other defense/security services (e.g., defense contractor training, etc.).

Investments in infrastructure and pad-development are critical to attracting new industries or expansion of existing industries and sectors in the Region.

2.3 Selected Parcels

Draper Aden Associates met with the local economic developers, visited each site, and reviewed Virginia Scan and other readily available information, and compared each site's characteristics with the major factors for site suitability required for the targeted industries and sectors. Table 2.3 summarizes each site's capability with the selected targeted industries and sectors.

Table 2.3 - Capability with Targeted Industries and Sectors

Target Industries / Sectors Suitability	**Caroline Co. - Ladysmith Supersite**	**King & Queen Co. - West Point Airport**	**Gloucester Co. – Page School Site**	**Richmond Co. Commerce Park**	**Spotsylvania Co. - Webster 140**	**Stafford Co. - Venture Business Park**
Natural Resource Based						
Seafood/aquaculture/commercial fishing	N	Y	N	Y	N	N
Forestry, wood products, pulp	N	Y	N	N	N	N
Marine research	N	Y	N	Y	N	N
Resiliency/marine construction	N	Y	N	Y	N	N
Agriculture	Y	Y	Y	Y	Y	Y
Manufacturing	Y	Y	Y - small	Y - small	Y	Y - small
Distribution/Logistics	Y	N	N	Y	Y	Y
Information						
Data Centers	N[1]	N[3]	N	N	N	N
Finance and Insurance	Y	Y	Y	Y	Y	Y
Professional Services						
Defense/security	Y	Y	Y - small	Y - small	Y	Y
Home based businesses	N	N	N	N	N	N
Research Commercialization	Y	Y	Y	Y	Y	Y

[1]No redundancy available
[2]Redundancy is available.
[3]Due to unknown capacities / redundancy.

3.0 CAROLINE COUNTY LADYSMITH SUPERSITE

The Caroline County Ladysmith Supersite is a 1020-acre site located adjacent to and east of I-95 at Exit 110, south of Route 639 East (Ladysmith Road), and north of Route 601 (Golansville Road); refer to Figure 3.0. The property is privately owned; the Owners are currently offering the property at a purchase price ranging from $17,000 to $47,500 per acre for Rural Preservation and Business/Commercial or Industrial, respectively.

3.1 Land Use and Zoning

The majority of the total site area is forested/timbered with some farmland and residential structures. The Virginia Bazaar is located within this site off Bazaar Avenue, immediately adjacent to and east of I-95, and south of Route 639.

The existing zoning is Business / Commercial on the Virginia Bazaar site (approximately 97.3 acres), and along the northwest most portion of the site (approximately 3.80 acres.); Industrial over a 554-acre site south of Ladysmith Road and east of Route 633 (Bull Church Road); and the remaining is zoned Rural Preservation. Figure 3.1 shows the existing zoning for the total site area.

The Caroline County Comprehensive plan 2030 includes a portion of this site within the Primary Growth Area of the Ladysmith Community Plan. Refer to Map 8-1: Caroline County Land Use Map and Map 8-4: Ladysmith Community Plan Future Land Use Map in Appendix B. The Future Land Use Map shows Regional Business use near Exit 110 and west of Bull Church Road; Planned Mixed Use Development east of Bull Church Road; and Planned Residential Development north of Golansville Road and west of Bull Church Road. The remainder of the parcel is assumed to be zoned for Rural Preservation.

3.2 Site Conditions

The topography across the site generally increases from southeast to northwest is characterized by approximately 50 feet in topographic variation across the site. The highest elevations are at the north and west sections of the site near Bazaar Avenue and the northern portion of Bull Church Road. The site is tributary to Steven Mill Run and Reedy Swamp, which drains south to Polecat Creek, and east to the Mattaponi River. There are pockets of open water, and appear to be wetlands and streams; however,

there are no regulatory floodplains on the site. Geotechnical analysis and waters of the U.S. delineation and determinations will be critical in determining the actual developable areas of the site. Upon review of the topography and known surface water conditions, it appears approximately 60 to 70 percent of the site is developable. Figure 3.2 shows the topography of the site, and features of interest related to site conditions.

3.3 Infrastructure

The existing infrastructure is shown in Figure 3.3 and consists of water and sanitary sewer utility locations relative to the site location.

3.3.1 Water

Caroline County Public Utilities provides potable water to portions of the county. There is an existing water main along Ladysmith Road and into the Virginia Bazaar Site; size is unknown at this time. Development of the site for any use will require analysis to confirm system capacity and pressures are adequate for the proposed use and extensions of the water main into the site. A large-scale development will likely require the looping of the water main between the existing lines at Ladysmith and Golansville Roads.

3.3.2 Sanitary Sewer

Caroline County Public Utilities provides sanitary sewer service to a portion of the county. There is a sanitary main with force main and pump stations along the east side of I-95. This system discharges into the Polecat Creek Interceptor. Development of the site for any use will require analysis to confirm system capacities are adequate for the proposed use and extensions of the sewer mains into the site. A large-scale development may require upgrades to the existing pump stations downstream to the wastewater treatment facility.

3.3.3 Electric / Gas / Telecommunications / Fiber

The Rappahannock Electric Cooperative (REC) provides electric power to this site. REC will need to be contacted to confirm available capacity and redundancy to the site, and provide costs to serve the development.

Columbia Gas of Virginia provides natural gas to this area. Columbia Gas will need to be contacted to confirm available capacity and provide costs to serve the development.

According to the Virginia Broadband Availability Map and Integrated Broadband Planning and Analysis Toolbox, DSL and fiber are available in this area. Verizon is the telecommunications and fiber provider. Verizon will need to be contacted to confirm available capacity and provide costs to serve the development.

3.4 Due Diligence

Waters of the U.S. survey with Army Corps of Engineers approval within the last five years, geotechnical borings, boundary and topographical survey, cultural resources review, an Endangered Species review, and a Phase I Environmental Site Assessment are not available for this site. These studies must be completed prior to development to define the developable area, and inform the overall estimate of probable 'site readiness' cost and regulatory permit requirements.

3.5 Business / Industrial Use Compatibility

For business or industrial use, the County will need to rezone a significant portion of the site from Rural Preservation. The County will also need to update the Comprehensive Plan to allow for business / industrial use on this parcel. The Comprehensive Plan is currently compatible with business and industrial for the areas shown as Regional Business and Planned Mixed Use Development on the Ladysmith Community Plan Future Land Use Map in Appendix B.

The development will require significant infrastructure improvements to extend water, sanitary sewer, electric, gas, telecommunications, and fiber to the development. Capacities for industrial use will need to be confirmed prior to development.

3.6 VBRSP Site Characterization Tier Level

Based on information provided by the County and readily available information, the Caroline County Ladysmith Super Site is a VBRSP Site Characterization Tier Level 1. Refer to Appendix C for the VBRSP Site Characterization Tier Levels criteria table.

3.7 Order of Magnitude Estimates of Probable "Site Readiness" Cost

The order of magnitude estimate of probable cost to raise the site characterization tier level of the Caroline County Ladysmith Super Site from 1 to 2 is $85,000 and to pad-ready (Tier 5) is $25M. The estimates are based on the following assumptions.

A. An estimate of rezoning costs and due-diligence items noted above are included. Additional studies required are not included.

B. Land acquisition costs are not included.

C. Water and sanitary sewer mains will be extended to Bull Church Road.

D. Earthwork is for mass grading only.

E. Improvements to existing roads and construction of internal roadways are not included.

F. Electric, gas, telecommunications, and fiber service improvements are not included.

G. VSMP initial permit fee and professional service fees to obtain Joint Permit Application approval are included.

Aerial Photograph

Ladysmith Supersite
Caroline County

SCALE: 1" = 2000'

PROJECT: 17010548-01

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Hampton Roads, VA
Raleigh, NC
Fayetteville, NC
Northern Virginia

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DATE: 09-13-17

FIGURE
3.0

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Zoning Map

Ladysmith Supersite
Caroline County

SCALE: 1" = 2000'

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FIGURE
3.1

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Site Conditions Map

Ladysmith Supersite
Caroline County

SCALE: 1" = 2000'

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FIGURE
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Infrastructure Map

Ladysmith Supersite
Caroline County

SCALE: 1" = 2000'

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FIGURE
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4.0 GLOUCESTER COUNTY PAGE SCHOOL SITE

The Gloucester County Page School Site is a 31-acre site located adjacent to and west of U.S. Route 17 (George Washington Memorial Highway and south of the intersection of U.S. Route 17 and Route 629 (T.C. Walker Road); refer to Figure 4.0.. The property is publicly owned by the Gloucester County School Board, and is scheduled to revert to the County Board of Supervisors in 2019. Page Middle School occupied this site until it was destroyed by a tornado in 2011. The site is contiguous to the current Gloucester Business Park.

4.1 Land Use and Zoning

The majority of the site is vacant, with previous parking areas and access drives still intact. Gloucester County Schools utilize the north portion of the site for a bus garage and maintenance facility, which is to be relocated to the new Page Middle School site at the northwest corner of U.S. Route 17 and Route 629.

The existing zoning is Suburban Countryside District (SC-1) illustrated in Figure 4.1. The Gloucester County Comprehensive Plan 2016 Future Land Use Map shows this area to be within the Suburban Countryside land use area.

4.2 Site Conditions

The site is pad-ready with gently-sloping topography, and no visual indications of waters of the U.S. (wetlands or streams) within the existing graded areas; refer to Figure 4.2.

4.3 Infrastructure

The existing infrastructure is shown in Figure 4.3 and consists of water and sanitary sewer utility locations relative to the site location.

4.3.1 Water

Gloucester County Public Utilities provides potable water to portions of the county. There is an existing 12-inch water main on the west side of U.S. Route 17, a 16-inch main along the north property line that connects to the 12-inch main along U.S. Route, and an 8-inch service connection to the 16-inch main.

Gloucester County Public Utilities has a water tank adjacent to the site. Development of the site for any use will require analysis to confirm system capacity and pressures are adequate for the proposed use.

4.3.2 Sanitary Sewer

Gloucester County Public Utilities provides sanitary sewer service to portions of the county; wastewater is treated by the Hampton Roads Sanitation District. There is an existing sanitary main along the east side of U.S. Route 17, adjacent to the site. Development of the site for any use will require analysis to confirm system capacities are adequate for the proposed use and extensions of the sewer mains into the site. A large-scale development may require upgrades to the existing pump stations downstream to the wastewater treatment facility.

4.3.3 Electric / Gas / Telecommunications / Fiber

Dominion Power provides electric power to this site. Dominion will need to be contacted to confirm available capacity and redundancy to the site, and provide costs to serve the development.

Virginia Natural Gas provides natural gas to this area, according to the State Corporation Commission. However, proximity of service to this site is unknown.

According to the Virginia Broadband Availability Map and Integrated Broadband Planning and Analysis Toolbox, DSL and fiber are available in this area. Verizon and Cox provides telecommunications, and Cox provides fiber in this area. Verizon and Cox will need to be contacted to confirm available capacity and provide costs to serve the development.

4.4 Due Diligence

Waters of the U.S. survey with Army Corps of Engineers approval within the last five years, geotechnical borings, boundary and topographical survey, cultural resources review, an Endangered Species review, and a Phase I Environmental Site Assessment are not available for this site. These studies must be completed prior to development to define the developable area, and inform the overall estimate of probable 'site readiness' cost and regulatory permit requirements.

4.5 Business / Industrial Use Compatibility

For business or industrial use, the County will need to rezone the site to a Business District (B-1), Rural Business District (B-4), or Limited Industrial District (I-1). The County will also need to update the Comprehensive Plan to allow for business / industrial use at the site location. The development will require significant infrastructure improvements to extend water, sanitary sewer, electric, gas, telecommunications, and fiber to the development.

Utility capacities for industrial use will need to be confirmed prior to development.

4.6 VBRSP Site Characterization Tier Level

Based on information provided by the County and readily available information, the Gloucester County Page School Site is a VBRSP Site Characterization Tier Level 1. Refer to Appendix C for the VBRSP Site Characterization Tier Level criteria. This site is currently not included in Virginia Scan database; the County should coordinate with VEDP to add this site to the database.

4.7 Order of Magnitude Estimates of Probable "Site Readiness" Cost

The order of magnitude estimate of probable costs to raise the site characterization tier level of the Gloucester County Page School Site from 1 to 2 is $8,000 and to pad-ready (Tier 5) is $100,000. The estimates are based on the following assumptions.

A. An estimate of rezoning costs and due-diligence items noted above are included. Additional studies required are not included.

B. Land acquisition costs are not included.

C. Improvements to existing roads and construction of internal roadways are not included.

D. Electric, gas, telecommunications, and fiber service improvements are not included.

E. VSMP initial permit fee and professional service fees to obtain Joint Permit Application approval are included.

Aerial Photograph

Page School Site
Gloucester County

SCALE: 1" = 1000'

PROJECT: 17010548-01

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FIGURE
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Zoning Map

Page School Site
Gloucester County

SCALE: 1" = 1000'

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FIGURE
4.1

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Site Conditions Map

Page School Site
Gloucester County

SCALE: 1" = 1000'

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FIGURE
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Infrastructure Map

Page School Site
Gloucester County

SCALE: 1" = 1000'

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FIGURE
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5.0 KING AND QUEEN COUNTY – WEST POINT AIRPORT SITE

The West Point Airport Site is a 276-acre site located south of Route 33 (Lewis B. Puller Memorial Highway) and adjacent to Route 643 (Airport Road), which provides access to the Middle Peninsula Regional Airport; refer to Figure 5.0. The overall site is comprised of three sections. The northern section is a 156-acres, and is privately owned by Kinney Jonathan C Trustee & Johnson Ralph W Trustee. The Town of West Point owns the southern adjacent section and consists of 120-acres. The southernmost section is a 20-acre site, and owned by the Middle Peninsula Regional Airport Authority. Figure 5.0 illustrates the three sections of ownership that comprise the West Point Airport site.

5.1 Land Use and Zoning

The majority of the site is densely wooded. The site's zoning is Industrial, which is also consistent with the King and Queen County Comprehensive Plan 2006. Zoning for the site is illustrated in Figure 5.1.

5.2 Site Conditions

The site has moderate slopes across the property with elevations ranging from 10 feet to 40 feet. The north boundary of the site is Goalders Creek. Goalders Creek drains into the York River at the west side of the property. There are several intermittent and perennial tributaries to the Creek onsite.

Portions of the site (approximately 17 acres) are within regulatory floodplain and floodway; refer to Figure 5.2. Floodplain and floodway areas are undevelopable. Additionally 42 acres are within the 0.2 percent annual chance flood (a.k.a. 500-year storm) or areas of the 1 percent annual chance flood (a.k.a. 100-year storm) with average depths of less than 1 foot or with drainage areas less than 1 square mile. The site is also encumbered by Resource Management Areas, which generally following the floodplain areas.

5.3 Infrastructure

The existing, known infrastructure is shown on Figure 5.3.

5.3.1 Water

There is no public water supply available to the site. Groundwater is the water source via wells that are approximately 250 feet deep. Development will require a Groundwater Withdrawal Permit from the

Virginia Department of Health. Water could be supplied on an individual basis or central system for the entire development via a separate authority. Refer to Appendix D – Preliminary Engineering Report for the Middle Peninsula Regional Industrial Park dated 1999 (Industrial Park Report) for more information; however, this information may be outdated and subject to new regulation.

5.3.2 Sanitary Sewer

There is no public sanitary service currently available to the site. The site is within the Hampton Road Sanitation District service area; however, the closest sanitary service and wastewater treatment facility is in the Town of West Point on the west side of the Mattaponi River, which is cost prohibitive for a connection. Septic systems are not feasible due to high groundwater. The wastewater system will need to be provided via a package plant; refer to Appendix D – Industrial Park Report for more information.

5.3.3 Electric / Gas / Telecommunications / Fiber

The Dominion Energy (VEPCO) provides electric power to this site. VEPCO will need to be contacted to confirm available capacity and redundancy to the site, and provide costs to serve the development.

Virginia Natural Gas provides natural gas to this area, according to the State Corporation Commission. However, proximity of service to this site is unknown.

According to the Virginia Broadband Availability Map and Integrated Broadband Planning and Analysis Toolbox, DSL and fiber are not available at this site. Virginia Broadband provides broadband service to this area. Virginia Broadband will need to be contacted to confirm available capacity and provide costs to serve the development.

5.4 Due Diligence

Waters of the U.S. survey with Army Corps of Engineers approval within the last five years, geotechnical borings, boundary and topographical survey, a current Endangered Species review, and a Phase I Environmental Site Assessment are not available for this site. These studies must be completed prior to development to define the developable area, and inform the overall estimate of probable 'site readiness' cost and regulatory permit requirements.

A cultural resources (archaeological and architectural) search with the Virginia Department of Historic Resources was completed for this area in 1999. There are no archeological or historic sites on this parcel, as per the Industrial Park Report.

The Industrial Park Report included a review of endangered species. According to the Industrial Park Report, there is documentation of a Bald Eagle nest near the parcel. The developers should complete an updated Endangered Species review with the Virginia Department of Conservation and Recreation (DCR), the U.S. Fish and Wildlife Service (USFWS), and the Virginia Department of Game and Inland Fisheries (DGIF).

5.5 Business / Industrial Use Compatibility

The site is currently zoned Industrial. The initial cost for the water and sewer system to support an industrial use may be cost prohibitive.

5.6 VBRSP Site Characterization Tier Level

Based on information provided by the County, Planning District Commission, and readily available information, the West Point Airport Site is a VBRSP Site Characterization Tier Level 2. Refer to Appendix C for the VBRSP Site Characterization Tier Level criteria. This site is currently not included in the Virginia Scan database; the County should coordinate with VEDP to add this site to the database.

5.7 Order of Magnitude Estimates of Probable "Site Readiness" Cost

The order of magnitude estimate of probable costs to raise the site characterization tier level of the West Point Airport Site from 2 to 3 is $430,000, and to pad-ready (Tier 5) is $10M. The estimates are based on the following assumptions.

A. Land purchase price is estimated at $3,000 per acre, and is not included in the above estimate.

B. Due-diligence items noted above are included. Additional studies required are not included.

C. Improvements to Airport Road are included; construction of internal roadways is excluded.

D. Earthwork is for mass grading only.

E. Water supply and treatment are included, based on estimates provided in the Industrial Park Report and increased for inflation.

F. Wastewater collection and treatment are Water supply and treatment are included, based on estimates provided in the Industrial Park Report and increased for inflation.

G. Electric, gas, telecommunications, and fiber service improvements are not included.

H. VSMP initial permit fee and professional service fees to obtain Joint Permit Application approval are included.

Aerial Photograph

West Point Airport
King and Queen County

SCALE: 1" = 2000'

PROJECT: 17010548-01

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FIGURE
5.0

Path: \\draperaden.net\daa\Projects\2017\1701\0500\17010548\17010548-010301\GIS\Site-2 Fig-1 West Point Airport.mxd

Zoning Map

West Point Airport
King and Queen County

SCALE: 1" = 2000'

PROJECT: 17010548-01

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FIGURE
5.1

Path: \\draperaden.net\daa\Projects\2017\1701\0500\17010548\17010548-010301\GIS\Site-2 Fig-2 West Point Airport.mxd

Site Conditions Map

West Point Airport
King and Queen County

SCALE: 1" = 2000'

PROJECT: 17010548-01

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FIGURE
5.2

Path: \\draperaden.net\daa\Projects\2017\1701\0500\17010548\17010548-010301\GIS\Site-2 Fig-5 West Point Airport.mxd

Utility information not available at this time.

Infrastructure Map

West Point Airport
King and Queen County

SCALE: 1" = 2000'

PROJECT: 17010548-01

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FIGURE
5.3

Path: \\draperaden.net\daa\Projects\2017\1701\0500\17010548\17010548-010301\GIS\Site-2 Fig-4 West Point Airport.mxd

6.0 RICHMOND COUNTY COMMERCE PARK

The Richmond County Commerce Park has approximately 30 to 35 acres remaining for development. The park is located east of Route 3 (History Land Highway) at Commerce Parkway within the Town of Warsaw; refer to Figure 6.0. The Board of Supervisors of Richmond County owns the remaining parcels. Land purchase price is estimated at $30,000 per acre.

6.1 Land Use and Zoning

The remaining parcel to the north is graded; the south parcel is ungraded and currently used as cropland. The site's zoning is Industrial, and illustrated in Figure 6.1

6.2 Site Conditions

The site has minimal topographic variation with an average elevation of approximately 130 feet. There is a minimal topographic high towards the southwestern portion of the site at an elevation of 140 feet, as illustrated in Figure 6.2. There are no visual indications of waters of the U.S. (wetlands or streams) within the site zoning. There is also a stormwater management facility, which can be modified to provide both stormwater quality and quantity controls in accordance with the latest regulations.

6.3 Infrastructure

The existing infrastructure is shown in Figure 3.3 with the potential for water and sanitary sewer. The existing water and sanitary sewer lines are accessible at the site at and within the site vicinity. Electric, gas, and telecommunications are potentially available through various service providers at the site location.

6.3.1 Water

Town of Warsaw provides potable water to the site; there is an existing water line along Commerce Parkway for connection by a future industry.

6.3.2 Sanitary Sewer

Town of Warsaw operates the wastewater system that serves this site; there is an existing sanitary sewer main along Commerce Parkway for connection by a future industry. The Town of Warsaw's Waste Water Treatment Plant existing capacity is 300,000 gallon per day.

6.3.3 Electric / Gas / Telecommunications / Fiber

The Dominion Energy (VEPCO) provides electric power to this site. VEPCO will need to be contacted to confirm available capacity and redundancy to the site, and provide costs to serve the development.

WGL provides natural gas to this area, according to the State Corporation Commission. However, proximity of service to this site is unknown.

According to the Virginia Broadband Availability Map and Integrated Broadband Planning and Analysis Toolbox, DSL is available at this site. Verizon service to this area, and will need to be contacted to confirm available capacity and provide costs to serve the development.

6.4 Due Diligence

Waters of the U.S. survey with Army Corps of Engineers approval within the last five years, an Endangered Species review, and a cultural resources (archaeological and architectural) review are not available for this site based on our research to date. These studies must be completed to achieve VBRSP site characterization Tier Level 4, and should be completed prior to development. This information will help to confirm the developable area, and inform the overall estimate of probable 'site readiness' cost and regulatory permit requirements.

The County has referenced that geotechnical borings, boundary and topographical survey, and a Phase I Environmental Site Assessment are available for this site. These documents need to be provided to achieve VBRSP Tier Level 4.

6.5 Business / Industrial Use Compatibility

The site is currently zoned Industrial.

6.6 VBRSP Site Characterization Tier Level

Based on information provided by the County and readily available information, the Richmond County Commerce Park is a VBRSP Site Characterization Tier Level 2.5, since the due diligence studies have not been completed. Refer to Appendix C for the VBRSP Site Characterization Tier Level criteria.

6.7 Order of Magnitude Estimates of Probable "Site Readiness" Cost

The order of magnitude estimate of probable costs to raise the site characterization tier level of the Richmond County Commerce Park from 2.5 to 3 is $15,000 and to pad-ready (Tier 5) is $700,000. The estimates are based on the following assumptions.

A. Land acquisition costs are excluded.

B. Due-diligence items noted above as required are included. Additional studies required are not included.

C. Geotechnical borings, boundary and topographical survey, and a Phase I Environmental Site Assessment are assumed to be available and, therefore, are excluded.

D. VSMP initial permit fee and professional service fees to obtain Joint Permit Application approval are included.

E. New access roads are excluded.

F. Earthwork is for mass grading of the south parcel only.

G. Water and sanitary service extensions are excluded.

H. Electric, gas, telecommunications, and fiber service improvements are not included.

I. VSMP initial permit fee and professional service fees to obtain Joint Permit Application approval are included.

Path: \\draperaden.net\daa\Projects\2017\1701\0500\17010548\17010548-010301\GIS\Site-4 Fig-1 RichmondCo Commerce.mxd

Aerial Photograph

Richmond County Commerce Center
Richmond County

SCALE: 1" = 1000'

PROJECT: 17010548-01

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FIGURE
6.1

Zoning Map

Richmond County Commerce Center
Richmond County

SCALE: 1" = 1000'

PROJECT: 17010548-01

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FIGURE
6.1

Path: \\draperaden.net\daa\Projects\2017\1701\0500\17010548\17010548-010301\GIS\Site-4 Fig-2 RichmondCo Commerce.mxd

Site Conditions Map

Richmond County Commerce Center
Richmond County

SCALE: 1" = 1000'

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FIGURE
6.2

Path: \\draperaden.net\daa\Projects\2017\1701\0500\17010548\17010548-010301\GIS\Site-4 Fig-5 RichmondCo Commerce.mxd

Infrastructure Map

Richmond County Commerce Center
Richmond County

SCALE: 1" = 1000'

PROJECT: 17010548-01

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FIGURE
6.3

Path: \\draperaden.net\daa\Projects\2017\1701\0500\17010548\17010548-010301\GIS\Site-4 Fig-4 RichmondCo Commerce.mxd

7.0 SPOTSYLVANIA COUNTY WEBSTER 140

The Spotsylvania County Webster 140 site is approximately 140 acres of undeveloped land. The site is located west of U.S. Route 1 and west of I-95, south of Mudd Tavern Road, and less than one mile from Exit 118 on I-95. The site is privately owned with a sales price of $100,000 and $65,000 per acre for sites A and B, respectively. Refer to Figure 7.0 for the parcel location and designations.

7.1 Land Use and Zoning

The majority of the site is cropland with forested areas, and two open water features within the steep sloped areas. The site is currently zoned Agriculture (A-1). Refer to Figure 7.1.

The Spotsylvania County Comprehensive Plan was updated in 2016 and includes this site within the Primary Development Boundary with an "Employment Centers" designation; refer to Appendix E for the Future Land Use Map. The Employment Center designation is described in the Comprehensive Plan "…to be the primary location for new office and industrial development within the County, with the focus on larger scale office complexes, industrial users, and business parks."

7.2 Site Conditions

The site has a moderately sloping topography across the portion of the property currently used as cropland with elevations ranging from 220 feet to 255 feet. The remaining parcel will be challenging to develop due to the existing water feature and steep slopes toward the Mattaponi River.

7.3 Infrastructure

The existing infrastructure is shown in Figure 7.3 with the potential for water and sanitary sewer. The existing water and sanitary sewer lines are accessible within the site vicinity. Electric, gas, and telecommunications are potentially available through various service providers at the site location.

7.3.1 Water

The Spotsylvania County Utilities/Public Works Department provides potable water to the County; there is an existing water line along Mudd Tavern Road that will need to be extended approximately 3000 feet along U.S. Route 1 to the south line of tax parcel 76-A-58 to serve future development. Prior to any work,

the Spotsylvania County Utilities/Public Works Department should be consulted to confirm system capacity and pressures are adequate for the proposed use and extensions of the water main into the site.

7.3.2 Sanitary Sewer

The Spotsylvania County Utilities/Public Works Department provides sanitary sewer service to portions of the county. There is an existing sanitary sewer main along Mudd Tavern Road; due to the topography, a pump station will be required near the south portion of the site with a force main north along U.S. Route 1 discharging to a gravity sewer along Mudd Tavern Road. Prior to any development, the Spotsylvania County Utilities/Public Works Department should be consulted to confirm system improvements that may be required and capacities are adequate for the proposed use.

7.3.3 Electric / Gas / Telecommunications / Fiber

The Rappahannock Electric Cooperative (REC) provides electric power to this site. REC will need to be contacted to confirm available capacity and redundancy to the site, and provide costs to serve the development.

Columbia Gas of Virginia provides natural gas to this area. Columbia Gas will need to be contacted to confirm available capacity and provide costs to serve the development.

According to the Virginia Broadband Availability Map and Integrated Broadband Planning and Analysis Toolbox, DSL and fiber are available to this area via Verizon. Verizon will need to be contacted to confirm available capacity and provide costs to serve the development.

7.3.4 Due Diligence

Waters of the U.S. survey with Army Corps of Engineers approval within the last five years, geotechnical borings, boundary and topographical survey, cultural resources review, an Endangered Species review, and a Phase I Environmental Site Assessment are not available for this site. These studies must be completed prior to development to define the developable area, and inform the overall estimate of probable 'site readiness' cost and regulatory permit requirements.

7.4 Business / Industrial Use Compatibility

For business or industrial use, the County will need to rezone A-1 to an Office, Commercial, or Industrial zoning.

The development will require significant infrastructure improvements to extend water, sanitary sewer, electric, gas, telecommunications, and fiber to the development. Capacities for industrial use will need to be confirmed prior to development.

7.5 VBRSP Site Characterization Tier Level

Based on information provided by the County and readily available information, the Spotsylvania County Webster 140 site is a VBRSP Site Characterization Tier Level 2. Refer to Appendix C for the VBRSP Site Characterization Tier Level criteria.

7.6 Order of Magnitude Estimates of Probable "Site Readiness" Cost

The order of magnitude estimate of probable costs to raise the site characterization tier level of the Spotsylvania County Webster 140 site from 2 to 3 is $240,000, and to pad-ready (Tier 5) is $4.6M. The estimates are based on the following assumptions.

An estimate of rezoning and due diligence costs are included.

A. Due-diligence items noted above are included. Additional studies required are not included.

B. Water and sanitary sewer service to the site are included.

C. Earthwork is for mass grading only.

D. Improvements to existing roads and construction of internal roadways are excluded.

E. Electric, gas, telecommunications, and fiber service improvements are excluded.

F. VSMP initial permit fee and professional service fees to obtain Joint Permit Application approval are included.

Aerial Photograph

Webster 140
Spotsylvania County

SCALE: 1" = 1000'

PROJECT: 17010548-01

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FIGURE
7.0

Path: \\draperaden.net\daa\Projects\2017\17010500\17010548\17010548-010301\GIS\Site-5 Fig-1 Thornburg.mxd

Zoning Map

Webster 140
Spotsylvania County

SCALE: 1" = 1000'

PROJECT: 17010548-01

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FIGURE
7.1

Path: \\draperaden.net\daa\Projects\2017\1701\0500\17010548\17010548-010301\GIS\Site-5 Fig-2 Thornburg.mxd

Site Conditions Map

Webster 140
Spotsylvania County

SCALE: 1" = 1000'

PROJECT: 17010548-01

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FIGURE
7.2

Path: \\draperaden.net\daa\Projects\2017\17010\500\17010548\17010548-010301\GIS\Site-5 Fig-5 Thornburg.mxd

Infrastructure Map

Webster 140
Spotsylvania County

SCALE: 1" = 1000'

PROJECT: 17010548-01

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FIGURE
7.3

Path: \\draperaden.net\daa\Projects\2017\1701\0500\17010548\17010548-010301\GIS\Site-5 Fig-4 Thornburg.mxd

8.0 STAFFORD COUNTY VENTURE BUSINESS PARK

The Stafford County Venture Business Park consists of approximately 106 acres of undeveloped land with a 1360 foot, 2-lane access road (Venture Drive) into the site. The site is located east of and adjacent to I-95, west of Wyche Road, and south of Courthouse Road, which is Exit 140 on I-95. Refer to Figure 8.0 for the parcel location.

Improvements to Exit 140 are currently under construction that will provide more convenient access to I-95 to/from this site. Refer to http://www.virginiadot.org/projects/fredericksburg/interstate_95-route_630_courthouse_road_interchange_relocation_and_route_630_widening.asp for more information.

8.1 Land Use and Zoning

The site is undeveloped except for the Venture Drive extension with adjoining utilities, and the stormwater management facility to the south. The north 56 acres is zoned B2 Urban Commercial; the south 49.6 acres is zoned B3 Office. Refer to Figure 8.1.

The Stafford County Comprehensive Plan 2016 - 2036 and includes this site within the Courthouse Planning Area as Commercial – Retail and Office; refer to Appendix F for the Courthouse Planning Area Land Use Concept. The following is an excerpt from the Comprehensive Plan – Chapter 3: The Land Use Plan.

> *Stafford County's 2015 Economic Development Strategic Action Plan identifies the Courthouse Area as a Priority Focus Areas because of its location, and current and future anchors. The area has four development resources planned that could transform the district: a new medical campus at the new Stafford Hospital Center, a new Interstate 95 (I-95) interchange, and a future Stafford Campus of Germanna Community College at the south end of the district. The area has long been talked about as a future location for a tourist visitor center, open-air market, and town square. Businesses, such as restaurants, hotels and supporting convenience retail, will be desired by employees and visitors, and the area could add to the diversity of Stafford County with health services, recreational activities and an active, pedestrian town center.*

8.2 Site Conditions

The site has moderate to steep slopes across the portion of the property currently with elevations ranging from approximately 110 to 230. The south portion (approximately 1.7 acres) of the property is encumbered by the resource protection area, wetlands, and floodplain adjacent to Accokeek Creek.

8.3 Infrastructure

The existing infrastructure is shown in Figure 8.3 and consists of water and sanitary sewer utility locations relative to the site location.

8.3.1 Water

A 12-inch water line runs along Venture Boulevard from the 8-inch water line in Wyche Road for approximately 1550 feet (south of the cul-de-sac), where it is reduced to a 10-inch line extending an additional 1100 feet to its terminus. Stafford County Department of Utilities (DOU) manages the water system. Prior to any work, the DOU should be consulted confirm system capacity and pressures are adequate for the proposed use and extensions of the water main into the site.

8.3.2 Sanitary Sewer

An 8-inch sanitary sewer runs from an existing sewer manhole west of U.S. Route 1 near the south portion of the site west and north into the development. Prior to any further development, DOU should be consulted to confirm capacities are adequate for the proposed use.

8.3.3 Electric / Gas / Telecommunications / Fiber

The Dominion Energy (VEPCO) provides electric power to this site. VEPCO will need to be contacted to confirm available capacity and redundancy to the site, and provide costs to serve the development.

Columbia Gas of Virginia provides natural gas to this site. Columbia Gas will need to be contacted to confirm available capacity and provide costs to serve the development.

According to the Virginia Broadband Availability Map and Integrated Broadband Planning and Analysis Toolbox, DSL is available at the site, and fiber is available along Route 630 (Courthouse Road). Verizon provides telecommunications and fiber to this site. Verizon will need to be contacted to confirm available capacity and provide costs to serve the development.

8.4 Due Diligence

Waters of the U.S. survey with Army Corps of Engineers approval within the last five years, an Endangered Species review, and a cultural resources (archaeological and architectural) review are not

available for this site based on our research to date. These studies must be completed to achieve VBRSP site characterization Tier Level 4, and should be completed prior to additional development. This information will help to confirm the developable area, and inform the overall estimate of probable 'site readiness' cost and regulatory permit requirements.

The Owner has referenced that geotechnical borings, boundary and topographical survey, and a Phase I Environmental Site Assessment have been completed. These documents need to be provided to achieve VBRSP Tier Level 4.

8.5 Business / Industrial Use Compatibility

For business or industrial use, the County will need to rezone A-1 to an Office, Commercial, or Industrial zoning.

The development will require infrastructure improvements to extend electric, gas, telecommunications, and fiber to the development. Capacities for industrial use will need to be confirmed prior to development.

8.6 VBRSP Site Characterization Tier Level

Based on information provided by the County and readily available information, the Richmond County Commerce Park is a VBRSP Site Characterization Tier Level 2.5. Refer to Appendix C for the VBRSP Site Characterization Tier Level criteria.

8.7 Order of Magnitude Estimates of Probable "Site Readiness" Cost

The order of magnitude estimate of probable costs to raise the site characterization tier level of the Stafford County Venture Business Park from 2.5 to 3 is $72,000 and to pad-ready (Tier 5) is $2.2M. The estimates are based on the following assumptions.

A. Land purchase price is estimated at $327,000 per acre for the B2 zoned area; this cost is not included.

B. Due-diligence items noted above are included. Additional studies required are not included.

C. Earthwork is for mass grading only.

D. Improvements to existing roads and construction of internal roadways are excluded.

E. Electric, gas, telecommunications, and fiber service improvements are excluded.

F. VSMP initial permit fee and professional service fees to obtain Joint Permit Application approval are included.

Aerial Photograph

Venture Business Park
Stafford County

SCALE: 1" = 1000'

PROJECT: 17010548-01

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FIGURE
8.0

Path: \\draperaden.net\daa\Projects\2017\1701\0500\17010548\17010548-010301\GIS\Site-6 Fig-1 Venture.mxd

Zoning Map

Venture Business Park
Stafford County

SCALE: 1" = 1000'

PROJECT: 17010548-01

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FIGURE
8.1

Path: \\draperaden.net\daa\Projects\2017\1701\0500\17010548\17010548-010301\GIS\Site-6 Fig-2 Venture.mxd

Site Conditions Map

Venture Business Park
Stafford County

SCALE: 1" = 1000'

PROJECT: 17010548-01

Draper Aden Associates
Engineering ◆ Surveying ◆ Environmental Services

2206 South Main Street
Blacksburg, VA 24060
540-552-0444 Fax: 540-552-0291

Richmond, VA
Charlottesville, VA
Hampton Roads, VA

Raleigh, NC
Fayetteville, NC
Northern Virginia

DESIGNED: SMF
DRAWN: SMF
CHECKED: JMV
DATE: 09-13-17

FIGURE
8.2

Path: \\draperaden.net\daa\Projects\2017\17010500\17010548\17010548-010301\GIS\Site-6 Fig-5 Venture.mxd

Infrastructure Map

Venture Business Park
Stafford County

SCALE: 1" = 1000'

PROJECT: 17010548-01

Draper Aden Associates
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2206 South Main Street
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FIGURE
8.3

Path: \\draperaden.net\daa\Projects\2017\1701\0500\17010548\17010548-010301\GIS\Site-6 Fig-4 Venture.mxd

APPENDIX A

Mary Ball Washington Region VAScan Sites Assessments Summary

Mary Ball Washington Region **TABLE 1**

VAScan Sites Assessments Summary

Site	Locality	Area (Acres)			Access			Infrastructure On or Adjacent to Site & Sufficient Capacity						Target Industries / Sectors Suitability													
		Total Parcel	***Buildable***	***Largest Continguous***	***within 5 miles of Intersate***	***within 5 miles of 4-lane limited access highway***	***rail***	***sewer***	***water***	***gas***	***electric***	***fiber***	***telecom***	***Natural Resource Based***	Seafood / aquaculture / commercial fishing	Forestry / wood / products / pulp	Marine research	Resiliency / marine construction	Agriculture	***Manufacturing***	***Distribution/Logistics***	***Data Centers***	***Finance and Insurance***	***Professional Services***	Defense / security	Research Commercialization	***Tourism***
Carmel Church Station Super Site	Caroline	1,100	1,100	421	Y	Y	Y	Y	N	N	Y	Y[2]	Y		N	N	N	N	Y	Y	Y	Y	Y		Y	Y	Y
Orrock-Simms Assemblage Super Site	Caroline	1,027	872	872	Y	Y	N	N[1,3]	N[3]	N[3]	N[3]	N[1,3]	N[3]		N	Y	N	N	Y	Y	Y	N	Y		?	Y	Y
Ladysmith Super Site	Caroline	1,020	1,000	550	Y	Y	N	Y - 200K GPD	Y - 900K Gallons	N	Y[1] - 230KV	N	Y		N	N	N	N	Y	Y	Y	N	Y		N	Y	Y
Roseman Mega Site	Caroline	550	500	550	Y	Y	N	N[3]	N[3]	N[3]	N[3]	N[3]	N[3]		N	N	N	N	Y	Y	Y	N	Y		?	Y	Y
Ladysmith Mega Site	Caroline	470	400	400	Y	Y	N	N[3]	N[3]	N[3]	N[3]	Y[2,3]	N[3]		N	N	N	N	Y	Y	Y	Y	Y		Y	Y	Y
Caroline Commerce Center	Caroline	300	250	200	Y	Y	N	Y	Y	N[3]	Y[1]	Y[2]	Y		N	N	N	N	N	Y	Y	Y	Y		Y	Y	Y
Gray Property	Caroline	300	157	157	N	Y	Y	N[3]	N[3]	N[3]	N[1,3]	N	N[3]		Y	N	N	N	Y	Y	Y	N	Y		N	Y	Y
Giles Data Center Site	Caroline	218	152	152	Y	Y	N	N[3]	N[3]	N[3]	Y	Y[2]	N[3]		N	N	N	N	Y	Y	Y	Y	Y		Y	Y	Y
WHC Property	Caroline	200	200	200	Y	Y	N	N[3]	N[3]	N[3]	N[1,3]	N	N[3]		N	N	N	N	Y	Y	Y	N	Y		N	Y	Y
Amireh Site	Caroline	200	150	97	Y	Y	N	N[3]	N[3]	N[3]	N[1,3]	N[3]	N[3]		N	N	N	N	Y	Y	Y	?	Y		?	Y	Y
Ronald Smith I-95 Site	Caroline	147	100	100	Y	Y	N	N[3]	N[3]	N[3]	N[1,3]	N[1,3]	N[3]		N	N	N	N	Y	Y	Y	N	Y		N	Y	Y
EDA Data Center Site	Caroline	125	115	115	Y	Y	N	N[3]	N[3]	N[3]	N[1,3]	N	N[3]		N	N	N	N	Y	Y	Y	N	Y		N	Y	Y
Ladysmith Industrial Park	Caroline	115	90	35	Y	Y	N	Y	Y	Y	Y[1]	Y[1]	Y		N	N	N	N	Y	Y	Y	N	Y		?	Y	N
Carmel Church Business Centre	Caroline	104	94	20	Y	Y	Y	Y	Y	Y	Y[1]	Y[1]	Y		N	N	N	N	N	Y	Y	N	Y		?	Y	N
Hamlet - 65-100 Acres at Ladysmith Road & Green Road	Caroline	100	100	65	Y	Y	N	Y	Y	Y	Y[1]	N	Y		N	N	N	N	N	Y	Y	N	Y		N	Y	Y
Virginia Bazaar Property	Caroline	97	80	80	Y	Y	N	Y	Y	Y	Y[1]	N	Y		N	N	N	N	N	Y	Y	N	Y		N	Y	Y
Thompson Industrial	Caroline	79	70	70	Y	Y	N	N[3]	N[3]	N[3]	N[1,3]	N[3]	N[3]		N	N	N	N	Y	Y	Y	N	Y		?	Y	Y

[1]Redundancy is not available or unknown.

[2]Redundancy is available.

[3]Provider listed; no utilites to site or capacity not provided.

Mary Ball Washington Region **TABLE 1**

VAScan Sites Assessments Summary

		Area (Acres)			Access			Infrastructure On or Adjacent to Site & Sufficient Capacity						Target Industries / Sectors Suitability													
Site	***Locality***	***Total Parcel***	***Buildable***	***Largest Continguous***	***within 5 miles of Intersate***	***within 5 miles of 4-lane limited access highway***	***rail***	***sewer***	***water***	***gas***	***electric***	***fiber***	***telecom***	***Natural Resource Based***	Seafood / aquaculture / commercial fishing	Forestry / wood / products / pulp	Marine research	Resiliency / marine construction	Agriculture	***Manufacturing***	***Distribution/Logistics***	***Data Centers***	***Finance and Insurance***	***Professional Services***	Defense / security	Research Commercialization	***Tourism***
Marshall Property	Caroline	73	65	73	Y	Y	N	N[3]	N[3]	N[3]	N[1,3]	N	N[3]		N	N	N	N	Y	Y	Y	N	Y		?	Y	N
Jones Ladysmith Road Site	Caroline	43	40	40	Y	Y	N	Y[3]	Y[3]	Y[3]	Y[1,3]	Y[1,3]	Y[3]		N	N	N	N	N	Y	Y	N	N		N	Y	Y
North View	Caroline	40	40	40	N	Y	N	N[3]	N[3]	N[3]	Y	N[1,3]	N[3]		N	N	N	N	N	Y	Y	N	Y		?	Y	N
Union Bankshares Business Park	Caroline	35	35	14	Y	Y	N	Y[3]	Y[3]	Y[3]	Y[1,3]	Y[1,3]	Y[3]		N	N	N	N	N	Y	Y	N	Y		?	Y	Y
The Shoppes at Carmel Church	Caroline	28	28	28	Y	Y	N	Y[3]	Y[3]	Y[3]	Y[1,3]	Y[1,3]	Y[3]		N	N	N	N	N	N	N	N	Y		N	?	N
Keller Ladder Pad Site	Caroline	21	21	21	N	Y	N	septic	Y[3]	Y[3]	Y[1,3]	N	Y[3]		N	N	N	N	Y	Y	Y	N	Y		?	Y	N
Hugh Jones 110 Interstate Site	Caroline	18	18	18	Y	Y	N	N[3]	N[3]	N	N[1,3]	N[1,3]	N[3]		N	N	N	N	Y	Y	Y	N	Y		?	Y	N
Celebrate Virginia South	Fredericksburg	210	210	63	Y	Y	Y	Y	Y	Y	Y[1]	Y[1]	Y		N	N	N	N	Y	Y	N	N	Y		?	Y	Y
Plank Road, I-95, Cowan Boulevard	Fredericksburg	89	70	70	Y	Y	Y	Y	Y	Y	Y[2]	Y[1]	Y		N	N	N	N	N	Y	Y	N	Y		N	Y	Y
Battlefield Industrial Park - Tyler St/Belman Rd	Fredericksburg	61	61	61	Y	Y	N	Y[3]	Y[3]	Y[3]	Y[1,3]	Y[3]	Y		N	N	N	N	N	Y	N	N	Y		?	Y	N
6500 Gordon W. Shelton Blvd. - Celebrate Virginia South	Fredericksburg	38	30	30	Y	Y	Y	Y[3]	Y[3]	Y[3]	Y[1,3]	Y[1,3]	Y[3]		N	N	N	N	N	Y	Y	N	Y		?	Y	N
Graves Court @ Fall Hill to Cowan - 3430 Fall Hill Ave	Fredericksburg	35	35	35	Y	Y	N	Y[3]	Y[3]	Y[3]	Y[1,3]	Y[1,3]	Y[3]		N	N	N	N	N	Y	Y	N	Y		?	Y	N
Fletcher Road	Gloucester	79	79	79	N	Y	N	N	N	N	N[1,3]	N	N[3]		Y	Y	Y	Y	N	Y	Y	N	?		?	?	Y
Gloucester Business Park	Gloucester	70	11	7	N	Y	N	Y	Y	N	Y[2] - 34.5KV	Y[1,3]	Y		Y	Y	Y	Y	N	Y	N	N	Y		Y	Y	Y
Cow Creek/Ware River	Gloucester	40	40	40	N	Y	N	N	N	N	N[1,3]	N	N[3]		Y	Y	Y	Y	Y	Y	N	N	?		?	?	Y

[1]Redundancy is not available or unknown.

[2]Redundancy is available.

[3]Provider listed; no utilites to site or capacity not provided.

VAScan Sites Assessments Summary

Site	Locality	Area (Acres)			Access			Infrastructure On or Adjacent to Site & Sufficient Capacity						Target Industries / Sectors Suitability													
		Total Parcel	***Buildable***	***Largest Contiguous***	***within 5 miles of Intersate***	***within 5 miles of 4-lane limited access highway***	***rail***	***sewer***	***water***	***gas***	***electric***	***fiber***	***telecom***	***Natural Resource Based***	Seafood / aquaculture / commercial fishing	Forestry / wood / products / pulp	Marine research	Resiliency / marine construction	Agriculture	***Manufacturing***	***Distribution/Logistics***	***Data Centers***	***Finance and Insurance***	***Professional Services***	Defense / security	Research Commercialization	***Tourism***
3295 George Washington Memorial Highway	Gloucester	39	39	39	N	Y	N	N[3]	N[3]	N	N[1,3]	N	N[3]		Y	Y	Y	Y	Y	Y	N	N	Y		?	Y	Y
King and Queen Commerce Park	King and Queen	112	112	112	N	Y	N	N[3]	N[3]	N	N[1,3]	N	N[3]		Y	Y	Y	Y	Y	Y	?	N	Y		?	Y	Y
Cleydael	King George	500	200	200	N	Y	N	N	N	N	Y	N[3]	N[3]		Y	Y	Y	Y	Y	N	N	N	N		N	?	Y
Taylor Property	King George	350	300	300	N	Y	Y	N[3]	N[3]	N	N[1,3]	N[3]	N[3]		?	?	?	?	Y	Y	?	N	Y		?	Y	Y
King George Industrial Park	King George	148	49	33	N	Y	Y	Y[3]	Y[3]	N	Y[1]	Y[1]	Y[3]		N	N	N	N	N	Y	N	N	Y		?	Y	Y
Mount Columbia	King William	1,142	1,100	146	N	Y	N	N[3]	N[3]	N[3]	N[1,3]	N[1,3]	N[3]		Y	Y	Y	Y	Y	Y	N	N	Y		?	Y	Y
Sweet Hall Site	King William	907	907	907	N	Y	Y	N	N	N	N[1,3]	N	N[3]		Y	Y	Y	Y	Y	?	N	N	?		?	?	Y
Max Spring Farm	King William	307	300	300	N	N	N	N	N	N[3]	N[1,3]	N	N[3]		Y	Y	Y	Y	Y	?	N	N	?		?	?	Y
King William Commerce Park	King William	170	125	50	N	Y	N	N[3]	N[3]	N[3]	N[1,3]	N	N[3]		Y	Y	Y	Y	Y	Y	?	N	?		?	?	Y
West Point Industrial Park	King William	100	70	22	N	Y	N	Y	Y	Y	Y[1,3]	Y[1,3]	Y		Y	Y	Y	Y	Y	Y	Y	N	Y		?	Y	N
Fontainebleau Industrial Park	King William	89	75	40	N	Y	N	Y	Y	N	Y[1,3]	N	Y		Y	Y	Y	Y	Y	Y	Y	N	?		?	Y	N
Aylett Lumber Site	King William	23	23	23	N	Y	N	N	N	N	N[1,3]	N	N[3]		Y	Y	Y	Y	Y	Y	Y	N	?		?	Y	Y
Kilmarnock Business and Technology Park	Lancaster	140	66	66	N	N	N	N[3]	N[3]	N	N[1,3]	N	N[3]		Y	Y	Y	Y	Y	Y	?	N	?		?	Y	?
Richmond County Commerce Center	Richmond	56	35	35	N	Y	N	Y	Y	Y	Y[1,3]	Y[1,3]	Y		Y	Y	Y	Y	Y	Y	Y	N	Y		?	Y	N
Gilman Tract East	Spotsylvania	666	666	666	Y	Y	N	N	N	N	Y	N	N		N	N	N	N	Y	Y	Y	N	Y		N	Y	Y
Ni Village- The Village and East Campus	Spotsylvania	333	333	333	Y	Y	N	N	N	N	N[3]	N[3]	N[3]		N	N	N	N	N	N	N	N	Y		?	Y	Y
Gilman Tract West	Spotsylvania	314	295	314	Y	Y	N	N[3]	N[3]	N[3]	N[3]	N	N[3]		N	N	N	N	Y	Y	Y	N	Y		?	Y	Y
Thornburg Webster 200 Site	Spotsylvania	200	200	200	Y	Y	N	N[3]	N[3]	N[3]	N[1,3]	N	N[3]		N	N	N	N	Y	Y	Y	N	Y		N	Y	Y

[1]Redundancy is not available or unknown.

[2]Redundancy is available.

[3]Provider listed; no utilites to site or capacity not provided.

APPENDIX B

Map 8-1: Caroline County Land Use Map

Map 8-4: Ladysmith Community Plan Future Land Use Map

Caroline County
Land Use Map
Caroline County, Virginia
Railroad
HCOD Line
Manufactured Homes
Resource Sensitive Overlay
Town Boundaries
Flood Plains
Fort A.P. Hill
Agricultural Preservation (0.04 DUA)
Public Lands
County Line
Low Density Residential (1-4 DUA)
Planned Development
Primary Growth Area
Note: - The "white" areas in the Carmel Church community south of 658 and west of Route 1 are designated Rural Transition Areas.
Note: Community and Village land use plans should be used for specific guidance in these locations.
GEORGE WASHINGTON
REGIONAL COMMISSION
STAFFORD COUNTY
KING GEORGE COUNTY
ESSEX COUNTY
KING AND QUEEN COUNTY
KING WILLIAM COUNTY
SPOTSYLVANIA COUNTY
HANOVER COUNTY
FORT A. P. HILL MILITARY RESERVATION
Port Royal
Port Royal Community Plan
Skinners Neck Community Plan
Bowling Green and Milford Community Plan
Central Point
Sparta
Shumansville
Doggett's Corner
Dawn Community Plan
Ladysmith Community Plan
Carmel Church Community Plan
Rutter Glen
Cedon
Cedon Village Plan
Chilesburg
Chilesburg Village Plan
Adopted by the Caroline County
Board of Supervisors on February 27, 2007
N
E
S
W
Miles
0 1 2 4 6

Map 8-1

LADYSMITH COMMUNITY PLAN
Future Land Use Map
LEGEND
Primary Growth Area Boundary
Neighborhood Business
Community Business
General Business
Regional Business
Light Industrial
Mobile Home Park
Office Business
Open Space/Flood Plain
Planned Mixed Use Development
Planned Residential Development
Residential Low Density
N
W
E
S
0
0.5
1
2
Miles
GEORGE WASHINGTON
REGIONAL COMMISSION
95
1
603
639
658
683
501

Map 8-4

APPENDIX C

VBRSP Site Characterization Tier Levels

Site Characterization Tier Levels

An applicant will retain a Site Development Professional to assess a site and to designate one of the following Site Characterization Tier Levels to such site:

(i) **Tier 1**: Site under (a) public ownership, (b) public/private ownership, or (c) private ownership which such private owner(s) agreeable to marketing the site for economic development purposes and to allowing access to the property for site assessment and marketing purposes, but at no established sales price. Comprehensive plan reflects site as appropriate for industrial or commercial development and use, but site is not zoned as such. Site has minimal or no infrastructure. Minimal or no due diligence has been performed.

(ii) **Tier 2**: Site under (a) public ownership, (b) public/private ownership, or (c) private ownership with an option agreement or other documentation of a commitment by the private owner(s) to a competitive sales price, to permit access to the site for site assessment, construction, and marketing, and to market the site for industrial or commercial economic development purposes. Comprehensive Plan reflects site intended for industrial or commercial development and use, but site is not zoned as such and a rezoning hearing needs to be scheduled. Site has minimal or no infrastructure. Minimal or no due diligence has been performed.

(iii) **Tier 3**: Site is zoned for industrial or commercial development and use. Site has minimal or no infrastructure. Due diligence including, among other things, a wetlands survey with Army Corps of Engineers approval within the last five years, geotechnical borings, boundary and topographical survey, cultural resources review, an Endangered Species review, and a Phase I Environmental Site Assessment, has been completed. Estimated costs of development have been quantified.

(iv) **Tier 4**: All infrastructure is in place or will be deliverable within 12 months. All permit issues have been identified and quantified.

(v) **Tier 5**: All permits are in place and the site is ready for a site disturbance permit from the locality in which the site is located.

APPENDIX D

Preliminary Engineering Report for the Middle Peninsula Regional Industrial Park

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Appendix A – Soil Descriptions

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CHAPTER ONE - INTRODUCTION

The Middle Peninsula Regional Industrial Park is an undeveloped 325-acre site, consisting of two separate parcels, with approximately 285 acres of developable land. One of the parcels consists of 68 acres owned by the Town of West Point; the other parcel consists of 257 acres owned by the Chesapeake Forest Products Company.

The property has approximately 1,600 feet of frontage along VA Route 643. VA Route 643 begins at VA Route 33 and extends south to the Middle Peninsula Regional Airport. The site lies approximately ½ mile southeast of VA Route 33 and 9 miles northeast of Interstate 64. Exhibit 1-1 presents the location of the proposed site.

The proposed industrial park lies within King and Queen County. The site is currently zoned for industrial use by the county. This location supports a strategy of focusing economic development along existing commercial centers. The industrial park site has the distinct advantage of immediate access to the ground transportation corridors of Rt. 33 and Interstate 64, as well as the Middle Peninsula Regional Airport. Exhibit 1-2 shows the major transportation corridors in the vicinity of the proposed site.

In April 1999, the Middle Peninsula Planning District Commission was awarded a $25,000 grant from the 1999 Industrial Site Development Fund (ISDF). The ISDF grant program is provided and administered by the Virginia Department of Housing and Community Development (VDHCD). This program's goal is to provide localities financial assistance to conduct preliminary engineering and environmental evaluation for the development of regional industrial sites. In addition to the ISDF grant, Gloucester County, King and Queen County, King William County, Mathews County and the Town of West Point provided 25 percent of the total project cost.

In order to assist with the planning of the Middle Peninsula Regional Industrial Park, the preliminary engineering report and environmental audit will address the following key issues concerning the infrastructure requirements and future impacts of the industrial park:

- Number of developable acres at the site;
- Preliminary design and layout of the site;
- Placement of sewer and water facilities, access roads, stormwater drainage facilities; and,
- Likely environmental or archaeological impacts.

The analysis and design alternatives presented in the report should allow the owner, and its agents, to continue the design of the industrial park. The proximity of the industrial park to the Middle Peninsula Regional Airport and the need to ensure the safety of aviation operations, are issues that will be integrated into the design concepts presented in the report.

Exhibit 1-1

Middle Peninsula Regional Industrial Park

Area Location Map

TALBERT & BRIGHT

ENGINEERING & PLANNING CONSULTANTS

10105 KRAUSE ROAD, SUITE 100

CHESTERFIELD, VIRGINIA 23832

PHONE: 804-768-6878 FAX: 804-768-6871

Exhibit 1-2
Middle Peninsula Regional Industrial Park

Vicinity Map

TALBERT & BRIGHT
ENGINEERING & PLANNING CONSULTANTS
10105 KRAUSE ROAD, SUITE 100
CHESTERFIELD, VIRGINIA 23832
PHONE: 804-768-6878 FAX: 804-768-6871

CHAPTER TWO - THE INDUSTRIAL PARK

2.1 Description

An industrial park is an assembly of land organized or planned for business and industrial facilities. It is now a well-established land use in communities throughout the U.S. Its suitability for industrial use is based on favorable conditions such as: topography, proper zoning, availability of utilities and transportation access.

Industrial parks are developed according to a comprehensive plan designed to ensure compatibility between the industries within the park, as well as the park and the community in which it is located. In order to ensure efficient business and industrial operations, as well as the compatibility with surrounding land uses, industrial parks are regulated through zoning and private restrictions incorporated as legal requirements or leases. These regulations pertain to specific use requirements such as: lot size, parking and loading requirements, building setbacks, and other provisions. When industrial parks are of sufficient size and are zoned properly, they can benefit the area by increasing land values.

The following elements are essential to a well-planned industrial park:

- A comprehensive plan;
- Compatibility among industrial operations in the park;
- Compatibility between the industrial park, the community, and surrounding land uses;
- Design controls, such as: streets designed for trucks and other traffic, building setbacks, lot size minimums, land area/building coverage ratio minimums, architectural control provisions, and specific use requirements;
- Openness and parklike character;
- Harmonious integration into neighborhood;
- Zoning to protect the surrounding area; and
- Continuing responsibility of park management to preserve compatibility between park and community, and protect of developer and tenants.[1]

[1] Urban Land Institute. *Business and Industrial Park Development Handbook.* Washington: Urban Land Institute, 1988.

2.2 Types of Industrial Parks

Although they share the integral elements and characteristics, which make up the industrial park concept, the industrial parks of today often vary widely in their design and uses.

Office Park

An office park is a development on a parcel of land, which is made up of separate office buildings. This development supports uses and open space, which are planned, designed, built and managed on an integrated and coordinated basis. The key to a successful office park is the controlled environment that provides the users/tenants with the essential facilities, which will allow them to efficiently conduct their business. The primary use in an office park, by definition, is limited exclusively to offices.

Tenants, for an office park, range from headquarters of major corporations, professional offices for lawyers, consultants, doctors, accountants, small businesses or even research and development related activities. Office parks require visible locations along major arterial highways or streets with convenient access.

Professional / Business Park

The business park is based on the same development concept as the industrial park or office park. The business park has introduced three important trends: 1) the growing convergence of office and industrial parks in terms of functions, activities and appearance; 2) the increase in the multiuse character of the industrial park; and 3) a desire to de-emphasize the industrial character of many industrial park occupants. Some multiuse business parks contain a variety of activities including traditional industrial uses such as warehouse / distribution, light manufacturing and research and development activities. Other types of land uses include headquarters offices, back offices, service oriented shopping centers, recreational facilities, health clubs, daycare centers, hotel conference centers, wholesale/retail showrooms, museums, and even performing art spaces. Business parks differ from industrial parks in terms of their sophisticated land use planning, high quality architectural and landscape design, increased variety of amenities, building flexibility, decreased reliance on rail access and a greater need for highway and airport access.

Warehouse/Distribution

Warehousing is typically located near population centers, but located in areas with lower priced land such as at the fringe of urban development. The main reason for its location is because warehouses are land intensive. These locations need to be well served by local, regional, or less importantly, national transportation networks.

Based on the type of industry being served, transportation needs could center around the location highway system, railway accessibility and air transport to different markets. Bulk warehouses require large tracts of land that are flat and can accommodate truck or rail services. These activities usually do not generate problems such as noise, odor or smoke. With careful site planning the problem of truck traffic can be avoided, which is usually the biggest problem generated by warehouse and distribution type parks.

Manufacturing

The manufacturing being done today has come a long way from the manufacturing practices which existed back in the early 1970's. The demand for clean, light-manufacturing is currently growing in today's economy and has been successfully obtained with today's technology. These uses have found business park locations to be compatible with their operational requirements, because in many cases they can be co-located with offices, warehouses and research facilities. With current environmental requirements noxious side effects are virtually non-existent and this type of manufacturing makes good neighbors to other business park activities.

Often, light manufacturing products are in relatively small units that can be transported by truck or air rather than by rail. Because it is "clean" operationally, light manufacturing uses are free to locate in many business parks that cannot accept heavier industry. Many light-manufacturing firms also are interested in planned environments that stress employee amenities, as are office and high technology firms.

Airport Industrial Park

Many airports and industrial parks have been developed within close proximity to each other. This is often due to the fact that both land uses have common characteristics and needs, and can often be mutually beneficial. The land use requirements of airports and industrial parks are much the same, therefore industrial parks are generally developed adjacent to or near airports. The following factors highlight some of the common land use needs of airports and industry, and they illustrate the benefits of developing airports in areas zoned for industry.

- **Both require a large amount of land.** Airports need large areas for their facilities and protection of their airspace and safety areas. Both industrial developments and airports require ample vacant land so as to protect future development from being restricted by neighboring land uses.

- **Both need to be segregated from residential areas.** Many areas zoned for industry are segregated from residential development to avoid any noise, pollution operational impacts to homes and neighborhoods. One of the biggest concerns about airport development is that airport noise and activity will negatively impact nearby residential land uses, so airports are often developed in industrial zones.

- **Transportation access is important.** A major consideration in planning for industrial development is transportation access. Access to major state and general road systems, rail lines, and airports is critical to industrial development, which relies on the ability to ship and receive goods efficiently. Airports also require proximity to major roads, since their users rely on ground transportation to get to and from the airport.

- **Airports and Industry offer mutually beneficial competitive advantages.** Direct or easy access to an airport facility enables industrial parks to capitalize on the inherent benefits of aviation access. Aviation related businesses are obvious beneficiaries but so are other types of companies, which rely on air travel for its executives and clients. Airports benefit from the increased aviation demand generated by local businesses.

Developing an airport industrial park has many benefits, but caution and careful planning are required to avoid hampering the future development of the airport. It is critical that an airport's airspace be protected from incursion from outside development. Planning for an airport industrial park must prevent any incursion to an airport's existing and future critical areas and airspace.

2.3 Airport Industrial Park Case Studies

The case studies selected for this report were chosen based on their similar size and their relationship with the associated airport. The choice of each case-study example was also based on the perception that the individual park is among the most successful of its type. Every effort has been made to provide accurate and up-to-date information. The following table presents a comparative overview of the case study examples.

Case Studies
Airport Industrial Park

	Accomack	Chesterfield	Louisa	Carroll County
Total Developable Acres	250	300	500	88
Owner/Developer	Industrial Develop-ment Authority of Accomack County	Chesterfield County	Louisa County Industrial Develop-ment Authority	Carroll County Industrial Development Authority
Park Development Complete	20%	95%	50%	55%
Construction Date	1978	1960-1970	1978	Early 1980's
Funding				
Federal	X		X	
State	X		X	
Local	X	X	X	X
Transportation Access (within 5 miles)				
Interstate		X	X	
State Route	X	X	X	X
Rail Access	X			
Parcel Sizes (Acres)				
0 – 5	X	X		X
6 – 10	X	X	X	
11 – 15	X	X	X	
> 15	X	X	X	
Roads				
Gravel				
Paved	X	X	X	X
Curb/Gutter				X
Utilities				
Electric Power	X	X	X	X
Water	X	X	X	X
Sewer	X	X	X	X
Natural Gas		X	X	X
Telephone	X	X	X	X
Types of Industry Using Park				
Aviation Related	X	X	X	
Other Transportation		X		
Manufacturing		X	X	X
Service	X	X	X	X
Wholesale Trade				
Agriculture	X			
Construction				
Financial			X	
Government	X	X	X	X
Public Utility				
Warehouse		X		
Airport				
Park Tenants Use Airport	X	X	X	X
Taxiway to Airport		X		
Park Has Restrictions Preventing Development Incompatible to Airport	X			

2.3.1 Chesterfield Airport Industrial Park

The Chesterfield Airport Industrial Park is located in Chesterfield County, Virginia. The 300-acre industrial park has direct access to State Route 10 and the Chesterfield County Airport. Chesterfield County owns the property and provided the funding for the infrastructure and initial site development of the park. State and Federal funds were not utilized in this development.

The industrial park contains more than 14,000 feet of industrial lot frontage fully equipped with water, sewer, drainage, electric and telecommunications service. Most of the infrastructure was developed between 1960 and 1970. Electric power is supplied by Virginia Power and Bell Atlantic provides all of the telecommunications services to the park. The Chesterfield County Utilities Department supplies water to the site from the Swift Creek Reservoir via 16" and 20" water mains. The Falling Creek Wastewater Treatment Plant provides wastewater treatment. The internal streets of the industrial park are located on 60-90 foot right of ways with 24 – 36 foot pavement widths.

The industrial park's direct access to State Route 10 is less than a ¼ mile from Route 288, which connects to Interstate 95. This corridor provides access to the major metro areas of the East Coast. State Route 10 is a 4-lane divided highway, and is a major east-west corridor for truck traffic. The Chesterfield County Airport is located on property adjacent to the industrial park. Taxiway access is provided for the park. Lot sizes, at the park, range from 1 to 20 acres. The current price per acre ranges between $20,000 and $30,000.

The industrial park property is zoned Industrial. Of the 59 lots, 14 are vacant. The current tenants of the park include 11 manufacturing, 5 warehouse, and 29 office/business uses. The average wage per job in Chesterfield County was $27,495 in 1997. (Bureau of Economical Analysis, U.S. Dept. of Commerce, 1998)

Chesterfield Airport Industrial Park	
Owner:	Chesterfield County
Location:	State Route 10 in Chesterfield, Virginia
Total Acreage:	300 acres
Range of Lot Sizes:	1-20 acres
Development Stage:	95% Developed
Zoning:	Industrial
Marketing:	County Economic Development markets parks with other county marketing efforts. No special incentives provided.
Infrastructure:	
Roads:	24 - 36 foot wide paved streets with shoulders. 60 – 90 foot right of way. No curb and gutter.
Electric Power:	Virginia Power
Water:	Provided by Chesterfield County Utilities Department.
Sewer:	Provided by Chesterfield County Utilities Department.
Telecommunications:	Bell Atlantic

Source: Virginia State Transportation Map
1998-99

Exhibit 2.3.1-1
Middle Peninsula Regional Industrial Park

Chesterfield County Airport Vicinity Map

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Chesterfield County Airport Industrial Park

Chesterfield County Virginia
ECONOMIC DEVELOPMENT

Source: 1999 Chesterfield Airport Industrial Park Directory

Exhibit 2.3.1-2
Middle Peninsula Regional Industrial Park

Chesterfield County Airport Industrial Park

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2.3.2 Louisa Industrial Airpark

The 500-acre Louisa Industrial Air Park is located off of State Route 22 near the town of Louisa, in Louisa County, Virginia. From State Route 22, a single access road extends from the park entrance to the airport. The park has excellent access to U.S. Routes 33, 522, and Interstate 64. Interstate 64 lies approximately 8 miles southeast of the airport and Interstate 95 is located 35 miles east of the facility, approximately one half hour away.

The Louisa County Industrial Development Authority (IDA) developed the 500-acre park in 1978 and is the current owner. Local, State, and Federal sources were used to acquire and develop the land for the park. The FAA provided funding to acquire the airport portion of the park; the IDA issued bonds to fund the purchase of the remaining portion of the air park, as well as the infrastructure and site development costs.

The park is zoned for industrial use and its current occupancy rate is approximately 35 percent. The subdivided lots have been developed to suit the needs of the tenants. They range in size from 10 acres to 30 acres. The current price per acre ranges between $8,000 to $15,000. Based on a survey taken by the Louisa County Industrial Development Authority in July of 1999, there were 450 employees working in the park. The 1997 average annual wage for Louisa County was $27,786. (Bureau of Economic Analysis, U.S. Dept. of Commerce, 1998)

The park is fully equipped with water, sewer, power, telephone, and natural gas services. The water system is a reservoir/well system with a maximum daily capacity of 1 MG and a storage capacity of 586,000 G. Water is distributed via a 12" water main. Louisa County provides wastewater service and the system has a 200,000G maximum daily capacity.

The Louisa County Industrial Development Authority has a marketing plan for the park, and also provides prospective tenants with a list of local government and business contacts to aid in the development process. The types of businesses located at the park include 6 manufacturing tenants, 7 professional office tenants, and 1 warehouse storage tenant. These businesses include: Klearfold Box Company, Louisa Aerial Survey, Louisa County Rescue Squad, ADC Louisa Map Publishers, Virginia Community Bank, Busada Manufacturers, Venture Corporation of Virginia, and Whitman Air Filtration, Inc. Although none of the park tenants require direct taxiway access to the airport, several of the businesses regularly use the airport.

Louisa Industrial Air Park	
Owner:	Louisa County Industrial Development Authority
Location:	State Route 22, Near the town of Louisa, Louisa County
Total Acreage:	500 acres
Range of Lot Sizes:	10 - 30 acres
Development Stage:	35% fully developed
Zoning:	Industrial
Marketing:	The IDA has a marketing plan in place for the park.
Infrastructure:	
Roads:	24-36 foot wide pave streets. No curb and gutter.
Electric Power:	Virginia
Water:	Reservoir/Well system provided by the Industrial Development Authority. (elevated tank)
Sewer:	Louisa County
Telecommunications:	Bell Atlantic

Source: Virginia State Transportation Map
1998-99

Exhibit 2.3.2-1
Middle Peninsula Regional Industrial Park

Louisa County Airport Vicinity Map

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Source: ADC Louisa Map Publishers

Exhibit 2.3.2-2
Middle Peninsula Regional Industrial Park

Louisa Industrial Air Park

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2.3.3 Carroll County Industrial Park

The Carroll County Air Business Center is an 88 acre industrial park located on Maryland Route 97, north of Westminster, Maryland. The park is adjacent to the Carroll County Regional Airport. The park is owned by Carroll County. Park development and marketing are the responsibility of the Carroll County Industrial Development Authority (IDA).

In 1969 the Carroll County Commissioners purchased 100 acres adjacent to the county airport for the purposes of creating an industrial park. In the early 1980s, public monies were spent to engineer, construct roads, utilities, stormwater management facilities and other infrastructure at the site. The County's purpose was to have ready-to-build industrial sites available in order to attract businesses that might want to locate in Carroll County. As of 1997, 55% of the park was built out.

The park has 31 industrial lots comprising 88.15 acres. As of 1997, 16 ½ parcels have been developed, 14 ½ parcels are undeveloped. The net development cost for the 88.15 acres was $2,544,048.

The park employs approximately 950 people with an annual payroll of $26,023,000. The average worker earns $27,393. The park is zoned industrial and currently has 50 businesses located at the park: 12 industrial, 28 commercial and 10 public entities. Tenants include Marada Industries, Laser Applications, Quality Glass and a restaurant.

The County receives over one-half million dollars in income from the less than 49 acres of developed land at the park. This is a significant income stream for the County for such a very small portion of the County's 288,000 acres.

Access to the park is from Maryland Route 97, a four and two lane highway, which runs north from Westminster, Maryland to Pennsylvania. The nearest interstate (I-70) is 25 miles from the park. Direct taxi access to the park is not available to aircraft utilizing the Carroll County Regional Airport. However, direct pedestrian and vehicle accesses are available.

Carroll County Air Business Center	
Owner:	Carroll County, Maryland
Location:	MD Route 97, 2 miles north of Westminster, Maryland
Total Acreage:	88 acres
Range of Lot Sizes:	2 – 5 acres
Development Stage:	55%
Zoning:	Industrial
Marketing/Financing	Development and marketing are handled by the Industrial Development Authority.
Infrastructure:	
Roads:	30 foot wide paved street with curb and gutter
Electric Power:	Baltimore Gas and Electric
Water:	Carroll County
Sewer:	Westminster
Natural Gas:	Baltimore Gas and Electric
Telecommunications:	Bell Atlantic

Source: Maryland State Transportation Map
1998-99

Exhibit 2.3.3-1
Middle Peninsula Regional Industrial Park

Carroll County Airport Vicinity Map

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2.3.4 Accomack County Industrial Park

The Accomack Airport Industrial Park is located near the town of Melfa, in Accomack County, Virginia. The industrial park has direct access to U.S. Highway 13. U.S. Highway 13 is a 4-lane divided highway, and a major north-south corridor for truck traffic. The Accomack County Airport is located on property adjacent to the industrial park. Airport Parkway, the park access road, provides direct auto access from U.S. Highway 13 to the airport terminal building.

The Industrial Development Authority of the County of Accomack (IDA) developed the park in 1978. The development costs were approximately $5.7 million (1999 dollars). Federal, State and local funds were used to purchase the land and develop 90 acres of the park. The Economic Development Administration and the Coastal Plains Regional Commission of the U.S. Department of Commerce provided approximately 60 percent of the project cost. The State provided funding nearly 5 percent of the project costs and the County of Accomack funded the remaining 35 percent of the project.

The park has 340 total acres of land zoned for industrial use. Only 250 acres of the park are suitable for development. Out of those 250 acres, 90 acres have either been developed by the IDA or sold. The remaining 160 acres are undeveloped and available for sale. In the developed portion of the park, the sizes of the lots range from 3 to 52 acres. The IDA is reluctant to subdivide or sell any of the undeveloped lots less than 5 acres. The approximate value of the vacant land in the park is $22,000 per acre. As an incentive for attracting businesses to the park, the IDA sells the vacant lots at a discount. The per acre cost of land in developed portion of the park is approximately $3,000 and $2,000 per acre in the undeveloped portion of the park. In exchange for the reduced cost of land, the IDA sets conditions which include construction to begin within one year and business operations to begin within three years.

The park contains more than 14,000 feet of industrial lot frontage fully equipped with water, sewer, drainage, electric and telecommunications service. The IDA supplies water to the park, which also has a 250,000-gallon, elevated storage tank on site. The Town of Onancock, Virginia provides wastewater treatment. The internal streets of the park are located in 60-foot rights of way with 24-foot wide pavement widths.

Although the park tenants do utilize the airport, none of them require direct taxiway access to the facility. In 1986, the IDA adopted a set of protective covenants and restrictions for the park, which include an airport safety provision. The provision prevents the construction of any building that will penetrate any of the airport's Part 77 surfaces. In July of 1999 the park reported 50 employees and expects to add 25 more in the spring of 2000.

As discussed previously, the IDA offers reduced land costs as a way to attract new industry. The park is also zoned Industrial and current tenants include Blue Crab Bay, Piedmont Aviation, Bay Beyond Inc., Truss tech, Interad, Eastern Shore of Virginia Chamber of Commerce, Shore Gin & Cotton, Insul-Tech, and the Virginia Wholesale

Farmers Market. In 1997, the average annual wage in Accomack County was $18,668. (Bureau of Economic Analysis, U.S. Dept. of Commerce, 1998)

The park is also located in an Enterprise Zone, providing substantial financial incentives to businesses expanding or locating facilities in the industrial park. In addition, the IDA provides financing assistance for the construction of new facilities through the use of industrial development bonds.

Accomack Airport Industrial Park	
Owner:	Accomack Industrial Development Authority
Location:	U.S. Highway 13, Near the town of Melfa, Accomack County
Total Acreage:	250 acres
Range of Lot Sizes:	3 - 52 acres
Development Stage:	20 %
Zoning:	Industrial
Marketing/Financing:	Marketing plan targets aviation related companies and light industry with 100 employees or less. Enterprise Zone tax credits and construction-financing assistance are available.
Infrastructure:	
Roads:	24 foot wide paved streets, 60 foot right of way. No curb and gutter.
Electric Power:	Delmarva Power
Water:	Provided by Accomack Industrial Development Authority.
Sewer:	Town of Onancock
Telecommunications:	Bell Atlantic

Source: Virginia State Transportation Map
1998-99

Exhibit 2.3.4-1
Middle Peninsula Regional Industrial Park

Accomack County Airport Vicinity Map

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Source: Accomack County Airport Property Map, 1997

Exhibit 2.3. 4-2
Middle Peninsula Regional Industrial Park

Accomack Airport Industrial Park

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2.4 Case Study Conclusions

The case studies illustrate several factors that are important in developing the Middle Peninsula Regional Industrial Park. The development of the park will be a long process. In each of the case studies, the industrial park development has lasted at least 20 years and only Chesterfield County's park is near completion. All the owners of the parks stressed patience in the parks early development stages. It will be important to follow a planning strategy, which looks at ways of attracting smaller businesses in the initial phases of the project. The only types of industry, which are located in all of the parks, are service and government sectors. These types of businesses do not require large lots and do not demand more than well and septic systems for their water and wastewater needs. All of the industrial parks have lots with ample road frontage, which is important to these smaller businesses. These types of industries do not have intensive infrastructure and land requirements, thus reducing the initial development costs of the park. These are often the most feasible types of tenants to which the park can be initially marketed.

The parks in all of the case studies pursued this strategy of developing parcels on the site for smaller businesses, while also reserving larger parcels for industries with greater infrastructure and land requirements. As the first phase of the park's development, a marketing plan targeting specific industrial sectors should be developed. The land and infrastructure requirements of these targeted industries must be protected during the initial development of the park. In the case of the Accomack Airport Industrial Park, a marketing plan has been developed which targets the manufacturing sector from the Hampton Roads and Washington / Northern Virginia regions.

Another critical reason for initially developing smaller parcels and attracting service or government entities to the site is the need to generate income from the site and obtain the important first "seed" parcels. For all of the parks studied this was important, since only two used state or federal sources to fund park development. Chesterfield County and Carroll County funded the development of their parks entirely with local funds. Louisa County was able to use state funding, as well as FAA funding to purchase the land for their park, as FAA funds were used to purchase the airport portion of the site.

Finally, all of the case studies reveal the importance of the airport to each of the industrial parks. Each park has tenants who regularly use the airport, and the airport serves as a point of access for clients and customers travelling to businesses within the air park, thus adding a benefit many industrial parks cannot offer.

CHAPTER THREE - SITE CHARACTERISTICS

3.1 Property Description

The 325-acre site for the Middle Peninsula Regional Industrial Park is located adjacent to, and north of, the Middle Peninsula Regional Airport. The site consists of two parcels. One 68 acre parcel is owned by the Town of West Point and the other 257 acre parcel is owned by the Chesapeake Forest Products Company.

The York River lies approximately ¼ mile to the west of the site's western boundary. Goalder's Creek runs along the western and northern boundary of the site. Baker's Creek lies along the eastern boundary of the site. Both creeks drain into the York River, approximately 1 mile from the site. The two creeks extend north of the site, and transition into non-tidal, forested wetlands.

Along Route 643, between VA Route 33 and the airport, there are 14 houses. West of Route 643 and north of the site is ASB Greenworld, a potting soil packaging plant. The remainder of the property adjacent to the site is vacant.

3.2 Topography

The site is primarily a coastal plain with a maximum difference in elevation of 30 feet. The topographical elevations range from elevation 10 to 40. The site is densely wooded with moderate slopes across the property. Exhibit 3.2-1 details the topography of the site.

3.3 Soil Types

King and Queen County is located in the Atlantic Coastal Plain. Most of the county is on the Sunderland Terrace, which is characterized as elevated, gently rolling plateau, dissected by numerous steep drainageways. The soils of the county range from sands and loamy sands to clay. King and Queen County is primarily agricultural, with 60 percent of the county being woodland, and 40 percent being farmland.

A soil map of the subject area (Exhibit 3.3-1) indicates the predominant soils are Tetotum fine sandy loams. These soils are moderately well drained with 0 to 6 percent slopes that rarely flood. The parent material is moderately fine textured fluvial sediments overlying stratified, coarse to medium textured sediments.

Small areas of Bojac loamy sand and State fine sandy loam are located on the northern portion of the property. These soils are described as yellowish-brown loamy sand and brown fine sandy loam, respectively. Both soils are well-drained and are located in the higher landscape positions, with State soils having more clay in the subsoil.

Exhibit 3.2-1
Middle Peninsula Regional Industrial Park

Site Topography

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Legend

Future Boundary of Middle Peninsula Regional Industrial Park

Soils Legend

1A	Augusta Fine Sandy Loam
2B	Bojac Loamy Sand
16A	State Fine Sandy Loam
19A	Tetotum Fine Sandy Loam
19B	Tetotum Fine Sandy Loam

Exhibit 3.3-1
Middle Peninsula Regional Industrial Park

Soil Conditions

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Kinston and Bibb soil types are predominate along Goalders Creek. These are hydric soils, which are poorly drained and occasionally flood. The permeability is moderate. These soil types pose development limitations due to their wetness. Most areas containing these soils are in woodland areas.

Although these soil types have limitations, experience shows that with good engineering design and sound construction practices, the existing site will be able to support development such as roads and buildings. Soil of similar characteristics is present on the airport and has proved suitable for construction of structures and pavement.

3.4 Cultural Resources

A search was made at the Virginia Department of Historic Resources (DHR) to determine the known archaeological and historic architectural resources in the study area. According to information made available by the DHR, there are no recorded historic or archaeological sites in the area of the proposed project. However, based on historical topographic quadrangles and the Chesapeake Corporation plat of survey, there appears to have been an old mill house and dam which were located on the northeastern portion of the property. According to research, the mill house and dam were removed over 100 years ago. No evidence of the house or dam was observed during the site reconnaissance.

3.5 ECOLOGY AND WATER RESOURCES

3.5.1 Endangered Species

According to the Department of Conservation and Recreation Natural Heritage Program (DCR), a Bald Eagle nest site has been documented in the project vicinity. Bald Eagle nest sites are often found in the midst of large wooded areas near marshes or other bodies of water. Threats to this species include human disturbance of nest sites and development of feeding and breeding areas. This species is currently listed as threatened by the United States Fish and Wildlife Service (USFWS) and as threatened by the Virginia Department of Game and Inland Fisheries (VDGIF). According to the VDGIF, no eagle nests have been documented within a one mile radius of the site. Further coordination with the USFWS and VDGIF will be needed if the nest is located near the project.

3.5.2 Water Quality

According to the December 10, 1997 DEQ Water Quality Standards (9 VAC 25-260-5 et seq.) the York River, including all tributaries to the headwaters that enter estuarine portions of the York are designated "nutrient enriched waters" These waters have nutrients such as chlorophyll "a", oxygen and phosphorous that contribute to undesirable growths of aquatic plant life in the surface waters.

A Virginia Department of Transportation (VDOT) drainageway is located on the property, west of Route 643. No streams on the National Park Service Nationwide Inventory, Final List of Rivers, potential Scenic Rivers or existing or potential State Scenic Byways are in the project area.

The York River and tidal portions of its tributaries (including Goalders Creek) are capable of propagating shellfish and so must adhere to restriction classifications for fecal coliform bacteria established by the State Department of Health. According to the water quality standards, all designated uses in these waters that receive sewage discharges, shall be protected. Wastewater Treatment will be addressed in Chapter 7 of this document.

3.5.3 Wetlands and Streams

The project area includes Goalders Creek and several intermittent and perennial tributaries. The major sources of surface water in King and Queen County are the Mattaponi and Poropotank Rivers and the Dragon Run Swamp. The county also has numerous millponds, beaver ponds, oxbow lakes, backswamps and manmade lakes that contribute to the flow of most of the smaller tributaries.

An approximate wetland and Waters of the U.S. (Waters) mapping was completed using existing soil maps, National Wetlands Inventory maps, a site boundary map, a plat of

survey and site reconnaissance. However, no formal wetland delineation was completed as part of this effort. The wetland and Waters mapping was not confirmed by the Corps of Engineers, nor was the boundary "surveyed". The project will probably require a formal wetland delineation and permits from the Corps of Engineers and DEQ for any wetland/stream impacts. Wetlands identified on the subject property during the site reconnaissance are shown on the Wetlands and Chesapeake Bay Preservation Area Map (Exhibit 3.5.3-1). The wetlands are generally confined to the outer margins of the property and several drainageways are located in the central portion of the site. It should be possible to develop a site plan that avoids most of these areas and is therefore "permitable".

3.5.4 Chesapeake Bay Preservation Act

An approximate mapping of Resource Protection Areas (RPAs) and Resource Management Areas (RMAs) according to the Chesapeake Bay Preservation Act (CBPA) was completed (Exhibit 3.5.3-1). The exact extent of these areas will need to be identified as part of the wetland delineation. The following is a brief description of these areas:

RPAs consist of sensitive lands at or near the shoreline that have an intrinsic water quality value due to the ecological and biological processes they perform or are sensitive to impacts which may cause significant degradation to the quality of state waters. These include:

- Tidal wetlands
- Nontidal wetlands connected by surface flow and contiguous to tidal wetlands or tributary streams
- Tidal shores
- A buffer area not less than 100 feet in width and located adjacent to and landward of the components listed above, and along both sides of any tributary stream.

RMAs include land types that, if improperly used or developed, have a potential for causing significant water quality degradation or for diminishing the functional value of the RPA. The following land categories are considered for inclusion in the Resource Management Area:

- Floodplains
- Highly erodible soils, including steep slopes
- Highly permeable soils
- Nontidal wetlands not included in the RPA
- Other lands under the provisions of subsection A of § 3.3 of the Chesapeake Bay Preservation Act.

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Exhibit 3.5.3-1
Middle Peninsula Regional Industrial Park

Wetland and Chesapeake Bay Preservation Area Map

The CBPA program requires that certain development standards be applied when development occurs in sensitive environmental areas known as RPAs and RMAs. The parcel where the facility will be located includes both RPAs and RMAs, which have been identified for this report.

The program requires performance standards for development such as restrictions on vegetative clearing, storm water management requirements, limits to the amount of impermeable surface created and septic tank construction and maintenance. The program also requires that a Water Quality Impact Report be prepared for projects that impact RPAs. RPAs are located along Goalders Creek on western and northern boundaries of the property.

There are RMAs located throughout the property. Palustrine forested and palustrine emergent wetlands were found in the southwest portion, just north of the Middle Peninsula Regional Airport. There are also several Waters located throughout the property. A dry intermittent channel was located to the east of Route 643. This channel begins at Goalders Creek, in the northern portion of the property and ends at the southern boundary, with a large wetland area at the end. To the west of the wetland area, a dry, intermittent stream was identified. Another dry channel with associated wetlands was located on the eastern portion of the property. There is also a very small wetland to the east of Woods Road in the northeast portion of the property.

If the project moves forward, the Chesapeake Bay Preservation Act will need to be as required by the performance standards incorporated in the King and Queen County zoning ordinance.

3.5.5 Floodplains

According to the FEMA Flood Insurance Rate Map for King and Queen County, dated September 5, 1990 the majority of the property is located outside the 500-year floodplain. However, portions of Goalders Creek along the western and northern boundaries, and a tributary located in the southwest portion of the property are inundated by the 100-year flood with fringe areas being 100-year and 500-year flood.

3.5.6 Groundwater

In this area, groundwater is usually obtained from several water-bearing strata, which commonly occur between depths of 50 and 200 feet. Wells drilled into these strata are generally for private residential use. In most areas, groundwater has a high content of minerals which lessens with depth. Groundwater flow in the area is generally west-southwest.

Because there are no existing utilities in the area and most of the areas around the site have good yields from the wells, groundwater supply should be an option for water supply. King and Queen is not located in a groundwater protection area. Therefore, a Groundwater Withdrawal Permit would not be needed for any proposed groundwater

supply wells. Permits will be needed from the Virginia Department of Health for wells that are constructed on the property.

3.6 HAZARDOUS MATERIALS

During the site reconnaissance on August 31, 1999 several rusted, empty 55-gallon drums, oil containers and debris were observed at several points along a jeep trail at the southeast portion of the property, at several points along Woods Road, and along a tributary crossing Woods Road at the northern portion of the property. It is recommended that this debris be removed and disposed of as a condition of the property transaction. No hazardous materials were found at the site, although no subsurface investigations or comprehensive site reconnaissance was completed.

CHAPTER FOUR - SITE DESIGN ALTERNATIVES

4.1 Proposed Uses

The site design of the Middle Peninsula Regional Industrial Park must be able to accommodate various lot configurations and sizes. Development of the site will be geared toward attracting businesses locating to or expanding in the region. Prospective business demand in the region already indicates a need for fully serviced industrial sites, between 10 and 30 acres in size, with a shell building between 30,000 sq. ft. and 100,000 sq. ft.

Another important consideration for the site design was the need to compliment the development of the Middle Peninsula Regional Airport into a facility capable of meeting the demands of businesses who value and rely upon general aviation services. In addition, the site design must conform to Federal Aviation Administration and Virginia Department of Aviation regulations protecting the safety of the adjacent airport's operations. Care is required to ensure that the proposed design will not preclude any future airport development.

Each parcel on the site will be developed with the necessary infrastructure in place. Water and sewer services will be provided to all of the industrial park parcels, which will range in size from 3 to 30 acres. Access roads will be provided throughout the site.

The site lies within an area zoned for industrial use, so no steps will have to be taken to bring the development into compliance with county zoning regulations. King and Queen County had initially proposed that the Chesapeake Corporation's parcel, serve as the location of a regional correctional facility. As part of the planning for the facility the County processed and received both an NPDES permit from the DEQ and a well permit from the Health Department. The DEQ NPDES permit has been granted an extension. The well permit has expired but can be renewed with no time delay for the project.

Several design alternatives were considered for the site. The alternatives provided are preliminary and should be used as a basis for developing the site. These layouts can be refined to accommodate a target industry or conform to desired phasing.

4.2 Alternative 1

Alternative 1 has a single and connected entrance for both east and west sections. Wetlands, streams, and topographic conditions have been used for logical lot lines to create well-shaped parcels. Consisting of 30 parcels ranging in size from 3 to 25 acres of useable land, this arrangement features:

- Smaller parcels at the entrance
- Smaller parcels adjacent the airport access point
- Middle size parcels centrally located along the main road
- Large parcels on higher land along the north boundary

- Excellent mix of small, medium and large parcels
- Excellent relationship to airport area

Exhibit 4.2-1 shows the proposed layout.

4.3 Alternative 2

Alternative 2 provides two points of access from Route 643 for the larger east area, and one point of access for the smaller west area. Again, wetlands and topographic features have been utilized for logical lot lines resulting in more easily developed lots. The principal difference in Alternative 2 is the larger number of smaller lots created. There are 40 lots from 2 to 30 useable acres with the following features:

- Cluster of smaller lots by the entrance
- Cluster of smaller lots by the airport access option
- Cluster of middle size lots centrally located in the east area
- Cluster of middle size lots in the west area
- Four large lots: one centrally located, three on north boundary
- Large number of lots in the 2 to 4 acre range
- Excellent relationship to airport area

Exhibit 4.3-1 shows the proposed layout.

Exhibit 4.2-1
Middle Peninsula Regional Industrial Park

Layout - Alternative 1

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Exhibit 4.3-1
Middle Peninsula Regional Industrial Park

Layout - Alternative 2

CHAPTER FIVE - WATER / WASTEWATER - DEMANDS AND FLOWS

There are two proposed layouts for the industrial park, Alternative 1 (Exhibit 4.2-1) and Alternative 2 (Exhibit 4.3-1). Alternative 1 contains 30 lots ranging in size of 3 to 25 acres and Alternative 2 contains 40 lots ranging in size of 2 to 30 acres. Both alternatives have a developable acreage of approximately 285 acres. In determining the water and wastewater requirements for the park, the type of industry and proposed use is required. In this case, this park is being developed and the type and use of industries that will locate in the park are not known. Some typical industries that locate in this type of park include:

- Storage/warehousing facilities
- Contractor offices/storage facilities
- Small assembly type industries
- Industries that would support the paper mill
- Offices
- Light industry
- Government Facilities

The water and wastewater demands for the above mentioned industries are somewhat alike. However, the fire flow requirements would vary significantly. Fire flow requirements are based on type of construction, materials stored, manufacturing processes, and any identified hazards.

The following table illustrates the proposed water and wastewater demands for the park for varying gallons per day/acre from 50 gpd/acre to 1000 gpd/acre. The average day water demand (domestic demand) is calculated by multiplying the number of developable acres by the estimated usage (column (3)). After the domestic demand is determined, a peak factor is used to convert the domestic demand to a maximum day demand. In most industrial applications a peak factor of 1.3 to 1.5 is used. For these calculations, a peak factor of 1.3 is used. The max day water demands are shown in column (5).

Industrial parks typically consume 10% of the water delivered for process. This means the average day wastewater flow equals the average daily water demand minus 10% (column (6)). The Virginia Department of Health Sewage Collection and Treatment Regulations require a peak design factor of 2.5 times the average day wastewater flow. Therefore, the maximum day wastewater demand is 2.5 times the average day wastewater demand (column (8)).

Proposed Water and Wastewater Flows

(1) Developed Acres (acres)	(2) Estimated Usage (gpd/acre)	(3) Avg. Day Water Demand (gpd)	(4) Water PF (no. units)	(5) Max. Day Water Demand (gpd)	(6) Wasterwater Demand (gpd)	(7) Wastewater PF (no. units)	(8) Max. Day Wastewater (gpd)	Gravity Sewer Size (inches)
285	50	14,250	1.3	18,525	16,673	2.5	41,681	8"
285	100	28,500	1.3	37,050	33,345	2.5	83,363	8"
285	150	42,750	1.3	55,575	50,018	2.5	125,044	8"
285	200	57,000	1.3	74,100	66,690	2.5	166,725	8"
285	250	71,250	1.3	92,625	83,363	2.5	208,406	8"
285	300	85,500	1.3	111,150	100,035	2.5	250,088	8"
285	350	99,750	1.3	129,675	116,708	2.5	291,769	8"
285	400	114,000	1.3	148,200	133,380	2.5	333,450	8"
285	450	128,250	1.3	166,725	150,053	2.5	375,131	8"
285	500	142,500	1.3	185,250	166,725	2.5	416,813	8"
285	550	156,750	1.3	203,775	183,398	2.5	458,494	8"
285	600	171,000	1.3	222,300	200,070	2.5	500,175	8"
285	650	185,250	1.3	240,825	216,743	2.5	541,856	8"
285	700	199,500	1.3	259,350	233,415	2.5	583,538	10"
285	750	213,750	1.3	277,875	250,088	2.5	625,219	10"
285	800	228,000	1.3	296,400	266,760	2.5	666,900	10"
285	850	242,250	1.3	314,925	283,433	2.5	708,581	10"
285	900	256,500	1.3	333,450	300,105	2.5	750,263	10"
285	950	270,750	1.3	351,975	316,778	2.5	791,944	10"
285	1000	285,000	1.3	370,500	333,450	2.5	833,625	10"

CHAPTER SIX - WATER SYSTEM

6.1 Water System Analysis

Three (3) types of water service were considered for the park:

(1) Service from an existing water utility
(2) On site well system (authority) to serve the entire industrial park
(3) Individual wells for each parcel

6.1.1 Existing Utilities

With the separation created by the Mattaponi River from West Point, there are no existing water and wastewater utilities in close proximity to the proposed industrial park. Furthermore, with the current rotating bridge there is no way to install a waterline to the bridge and it is cost prohibitive to direction drill the Mattaponi River. The distance from West Point to the proposed Middle Peninsula Industrial Park is approximately 5 miles. For these reasons, no further consideration was given to extending water service from West Point.

A meeting was held with a representative of West Point Public Works to determine if there were any future plans to extend water facilities east of the Mattaponi River. We were advised that there were no future facilities plans for extension of water service east of the Mattaponi River.

6.1.2 Individual Wells

Water service could be provided by a private well on each parcel. In the case of private wells, each well would be bored at the time the site is developed. The cost of boring the well could be included in the sitework (development) for the parcel and be borne by the industry doing the development. King and Queen Health Department advised that the average depth of bored wells east of the Mattaponi River is 250'. Furthermore, the quality of water in the area is excellent.

The main issue with individual wells is that fire protection would also have to be provided on site (additional cost to industry). In other words, the individual industry would be responsible for storage or on site protection.

6.1.3 Central Well System

A central well, storage and pump station could be installed to provide water service to the park. This would require the formation of a utility authority that would operate and maintain the potable well system. The requirements for operation of a potable water system are outlined in *WATERWORKS REGUALTIONS* governed by the Virginia Department of Health (VDH). These regulations detail the requirements for drinking water standards, operation of a waterworks, cross connection and backflow, pumping facilities, water storage, record keeping, and water distribution systems. A newly created utility would be permitted and overseen by VDH.

The capital costs associated with the construction of a central well, storage and pumping facility are included in Chapter 9 of this document. In addition to the capital costs there will also be operating costs for a newly created utility (authority) including power costs, chemical costs, and personnel costs. The authority would also have to develop a rate structure and capital improvement program to maintain service. Another option for consideration is that this water system could be owned and operated by a private contractor.

In order to attract industries that could contribute valuable tax revenue to the county, a central well system and appurtenances are recommended. This would include the central well, pump station, tanks, and water lines. The estimated cost for these facilities are included in Chapter 9.

At least a two-acre site should be dedicated for the central well, ground tank and pump station site. The suggested location for the well site is in the park on the east side of Route 643. The only governing requirement for the central well location is that the site produces the correct yield to support the park water system. For this preliminary engineering report, no subsurface investigations or vertical boring took place. As previously mentioned the King and Queen County Health Department advised that the wells in the area are of good water quality and average 250' depth.

6.2 Water Storage Facilities

When designing storage for a water system, equalization storage is calculated as 20% of the maximum day demand. The following table illustrates the equalization storage requirements based on the maximum day demands calculated in chapter 5.0 of this document (column 3).

The second factor in determining the required water storage facilities is fire flow. Fire flow is based on the type of industry, materials stored, type of construction, etc. This figure can vary from 500 gpm to 4000 gpm. For this park we have assumed a fire flow of 1000 gpm for a four-(4) hour duration. This converts to a fire flow storage of 240,000 gallons to fight a fire for a four (4) duration.

Sizing Water Infrastructure

(1) Max. Day Water Demand (gpd)	(2) Equalization Storage (gallons)	(3) Fire Flow Storage (gallons)	(4) Total Storage Req'd (gallons)	(5) Elevated Tank (gallons)	(6) Elevated Storage (dollars)	(7) Ground Storage (dollars)
18,525	3,705	240,000	243,705	250,000	$275,000	$162,500
37,050	7,410	240,000	247,410	250,000	$275,000	$162,500
55,575	11,115	240,000	251,115	250,000	$275,000	$162,500
74,100	14,820	240,000	254,820	250,000	$275,000	$162,500
92,625	18,525	240,000	258,525	250,000	$275,000	$162,500
111,150	22,230	240,000	262,230	275,000	$302,500	$178,750
129,675	25,935	240,000	265,935	275,000	$302,500	$178,750
148,200	29,640	240,000	269,640	275,000	$302,500	$178,750
166,725	33,345	240,000	273,345	275,000	$302,500	$178,750
185,250	37,050	240,000	277,050	275,000	$302,500	$178,750
203,775	40,755	240,000	280,755	275,000	$302,500	$178,750
222,300	44,460	240,000	284,460	275,000	$302,500	$178,750
240,825	48,165	240,000	288,165	300,000	$330,000	$195,000
259,350	51,870	240,000	291,870	300,000	$330,000	$195,000
277,875	55,575	240,000	295,575	300,000	$330,000	$195,000
296,400	59,280	240,000	299,280	300,000	$330,000	$195,000
314,925	62,985	240,000	302,985	300,000	$330,000	$195,000
333,450	66,690	240,000	306,690	300,000	$330,000	$195,000
351,975	70,395	240,000	310,395	325,000	$357,500	$211,250
370,500	74,100	240,000	314,100	325,000	$357,500	$211,250

Notes:

(1) Fire flow is based on 1000 gpm for a duration of 4 hours (column (3).

(2) Sized ground storage and elevated storage the same.

(3) Elevated storage is estimated at $1.10/gallon.

(4) Ground storage is estimated at $0.65/gallon.

The total amount of storage required is the sum of the equalization storage, plus the fire flow storage, which equals column (2) plus column (3) with the results illustrated in column (4).

On site storage should be an elevated tank and a ground storage tank. A pump station and well system would be required to fill the elevated tank. Both the ground storage and elevated tank are illustrated in the capital outlay cost illustrated in Chapter 9.

The location of the elevated tank should be on the highest ground possible to provide the necessary pressure to the park. The tank would require a site approximately 200'x200'and be located around the 40' contour. The estimated height of the tank would be 130', which would provide domestic pressures in the range of 40 to 50 psi.

6.3 Water Pumping Station

There are a couple of options for the pump station. The pump station can be:

(1) Variable speed pumping into a closed system. Depending on the demand, the pumps would run all the time and the speed would change. In order to provide reliable service a generator would also be required. (no elevated storage)

(2) Constant speed pumps with a hydroneumatic tank and air compressor. The pumps would pump to a set pressure and turn off. The hydroneumatic tank would provide pressure until the pressure falls and the pumps start back up. This type of system is used extensively in the tidewater area to serve private subdivisions. (limited storage, generator required to maintain service)

(3) Constant speed pumps pumping to an elevated tank. For an industrial application, this would be the most desirable layout. In this case standby power is an option, and equalization and fire flow storage are provided. Furthermore, constant speed controls are maintenance friendly and have a longer useful life than variable speed controls.

For option (3), the pump station would be set up with well pumps pumping directly into the ground storage tank. Depending on the quality of the ground water and Safe Drinking Water Act requirements, a chemical feed system such as sodium hypochlorite may be required for disinfection. Jars tests should be run on the groundwater source selected to determine if any type of treatment will be required at the central well site. These tests are not included in this report.

The mode of operation for the pump station would be as follows:

The well pumps would operate off of the ground tank level and pump well water into the ground tank to set levels. Next, the centrifugal pumps in the pump station would pump the water from the ground tank to the elevated water tank. At a set level the pumps in the

pump station would turn off. When the level falls to a predetermined level, the pumps would start back up and the cycle would continue.

The pump station could have a jockey pump/fire pump layout. The jockey pump would be sized to handle the maximum day water demand and the fire pump would be sized to handle the fire flow. For a maximum day demand of 370,500 the jockey pump would be sized to handle approximately 250 gpm and the fire pump would be sized to handle 1000 gpm (probably slightly higher). Depending on the phasing of the proposed development, the pump station could be built with smaller pumps and have larger pumps installed in the future.

The pump station and ground tank should be located on the same two acre central well site.

6.4 Water Line Size & Location

The proposed road layouts into the industrial park are preferred alignment for the water mains. The water main supplying the park would run adjacent to the road for the same distance. The water main is sized by adding the fire flow and maximum day demand together in gallons per minute. For a flow of 1250 gpm(1000 gpm fire flow + 250 gpm max day flow) a line size of 8" would be required (assumes 8" is looped through the industrial park). Note, the main factor in sizing the water line is the fire flow requirement. As the fire flow requirement increases, the size of the main also increases. For estimating purposes, we have used a fire flow of 1000 gpm and a line size of 8".

The distribution system would include fire hydrants (1000 lf internals), valves, and necessary appurtenances (tees, fittings, etc.). The water main material will be C900 PVC. The location of the water mains can be placed in the pavement or adjacent to the pavement (10' horizontal separation from the sanitary sewer collection lines required). Since the size of service for each industry is not known, it is suggested that the water main be installed outside the pavement to that services can be tapped and installed as industries move into the park. Figures 6.5-1 and 6.5-2 illustrate proposed water main layouts, tank location, and pump station location for each alternative. The water line estimates for alternatives 1 and 2 are included in Chapter 9. The cost for each service tap is not included since each type of industry is not known. The connection fee for service should include a construction cost by size to install the service. This type of billing structure would also be the responsibility of the utility provider.

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Exhibit 6.5-1
Middle Peninsula Regional Industrial Park
Utility Layout - Alternative 1

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Exhibit 6.5-2
Middle Peninsula Regional Industrial Park
Utility Layout - Alternative 2

CHAPTER SEVEN- WASTEWATER SYSTEM

7.1 Wastewater Generation

The calculations for the proposed wastewater flows are included in Chapter 5. The type of wastewater generated is not known. Wastewater discharges are related to the process that a particular industry is performing. For the types of industries listed in Chapter 5, the majority of these industries will only have domestic waste as a discharge. However, light industry could have different discharges from heavy metals to organic. Therefore, some type of pretreatment may be required for a particular industrial waste before it is sent to the collection system and the wastewater plant. As mentioned for the water system, the wastewater treatment plant will also be permitted by the state and have to meet certain discharge requirements. The permitted discharge requirements will determine the amount of pretreatment required before an industry discharges to the industrial park's wastewater plant. The above mentioned pretreatment would be governed by the provider of the wastewater treatment plant.

7.2 Proposed Wastewater System

Three types of wastewater service were considered:

(1) Extend gravity sewer from an existing utility
(2) Build a package plant to treat the wastewater
(3) Use on site disposal such as septic systems

7.2.1 Extend Gravity Sewer

With the separation created by the Mattaponi River from the Town of West Point, there are no existing wastewater utilities in close proximity to the proposed industrial park. The Town of West Point no longer operates its wastewater plants. The Hampton Roads Sanitation District (HRSD), an authority, now operates the wastewater plants. The distance from West Point to the proposed Middle Peninsula Industrial Park is approximately 5 miles. Similar to the water service, it would be cost prohibitive to directional drill the Mattaponi River for the amount of wastewater generated from the park. For these reasons, no further consideration was given to extending wastewater service from West Point.

A meeting was held with a representative of West Point Public Works to determine if there were any future plans to extend wastewater facilities east of the Mattaponi River. We were advised that there were no future plans for extension of wastewater service east of the Mattaponi River.

7.2.2 Package Plant

Similar to the discussion for a central well system, an entity such as a utility authority would have to be developed to handle the wastewater needs. A Virginia Pollution Discharge Elimination System (VPDES) permit would be necessary. At this time, the Environmental Protection Agency (EPA) is taking a serious look at the nutrient loadings on Virginia's rivers. The discharge from this proposed treatment plant would flow into Goalder's Creek and then the Mattaponi River.

If the authority does not desire to operate a wastewater facility, it may approach HRSD to investigate whether they would operate the treatment plant. HRSD has taken over the operation of both the Town of West Point's treatment plants. HRSD was contacted and has expressed an interest in operating this system as well.

7.2.3 On Site Septic System

King and Queen County VDH was contacted to determine the requirements for on site septic systems. The proposed area for the industrial park has a high water table and would not be suitable for septic systems. They also advised that the soils may be suspect in that area. Furthermore, we were advised that industrial wastewater flows should go through a treatment plant. Therefore, no further consideration was given to on site septic systems.

7.3 Evaluation of Treatment Alternatives

The first hurdle to overcome in determining the treatment alternatives is obtaining approval from the State to discharge the treated water to a creek feeding the York River. For discussion purposes, the assumption is made that these issues can be resolved and are including requirements found in other plants throughout the state. With the increased attention given to Virginia's rivers, the treatment train would most likely include:

(1) Preliminary Treatment (screening and grit removal)
(2) Primary Treatment
(3) Secondary Treatment
(4) Nitrification
(5) Denitrification
(6) Disinfection (chlorination)
(7) Dechlorination

In reviewing other conventional plants of this size, the average cost of construction for a conventional wastewater plant is approximately $10.00/gallon. This is the figure used to calculate the wastewater treatment plant cost illustrated in Chapter 9.

7.4 Collection System

For both alternatives a gravity collection system can be used. The proposed park is generally flat but there is some relief from east to west. The treatment plant would be located adjacent to Goalder's Creek at the end of the cul-de-sac on the west side of Route 643. The collection piping is 8" and 10" PVC with the majority being 8". As final contours and grades are established for the park, it may be possible to use 8" throughout the whole park (increasing the grade on the 8" line). However, at this stage, 8" and 10" were used in the estimates. The collection system should be located in the pavement with laterals for each parcel stubbed outside of the pavement. This will allow for easy connection in the future as the park develops. Manholes were estimated at 500' intervals.

Estimates for Alternative 1 and 2 are presented in Chapter 9. The developable acreage is the same for both alternatives but the road layout and lot layouts differ. Exhibits 6.5-1 and 6.5-2 illustrate the proposed collection layouts and the location of the proposed wastewater plant. Alternative 2 contains approximately 1500 of additional sewer lines compared to Alternative 1.

CHAPTER EIGHT - ROADWAYS AND DRAINAGE

A basic roadway design was considered for the development of the site. Specific items that were considered includes:

- Environmental impacts
- Geometric layout
- Pavement design
- Aesthetics

Both alternatives provide the option for direct road links with the airport, and ease of access and circulation throughout the site. The divided entrances are shown to recommend a landscaped median and to provide various signage opportunities.

Based on the proposed park size, an average vehicle per day (VPD) count was estimated to be 500. Also, to allow for ease of circulation and mobility throughout the site, a typical section of two twelve foot travel lanes is proposed including standard curb and gutter at the entrance to control runoff. The breakdown and cost for roadway development are contained in Appendix C.

The Virginia Department of Transportation may require improvements to Route 33 and 643 due to the increase in traffic volume. Items requested would be the strengthening of the existing pavement on Route 643, and the construction of turn lanes and road widening on Route 33. These items could be phased with the development of the property, but coordination would have to be made with VDOT on these improvements. At this time no additional improvements are proposed for Route 33 in the VDOT five year plan.

The site can be drained by standard ditch and culverts. The site drains to the east (Bakers Creek) and to the west (Goalders Creek). Because of the site's location to Goalders Creek and the York River, the Chesapeake Bay Preservation Act (CBPA) requirements for storm water runoff, as well as controlling the runoff, will be important issues with the development of the property. These requirements would require the introduction of best management practices (BMP). Two options that are available for addressing the storm water quality and storm water management issues:

(1) The site can be developed, as required, for each incoming tenant. This would include the roads, storm water drainage system and utilities. Storm water management and storm water quality would have to be addressed with the development of each lot. This would include the construction of BMP's for each lot as required by the CBPA. A benefit to this option would be lower initial construction costs.

(2) The site can be developed including roads, storm water drainage, utilities and "regional" SWM/BMP basins for the entire development. This basin would serve the development for both storm water management and storm water quality as

required by the CBPA. Exhibits show possible locations for the "regional" BMP's. With this option, land within the individual lots could be developed to its maximum. It would also be easier to maintain one or two basins rather than requiring each tenant to maintain their own.

CHAPTER NINE – FINANCIAL OVERVIEW

9.1 Estimated Costs

Opinions of probable cost were prepared for the major line item cost elements for each alternative in its ultimate build-out configuration. The costs are shown below and supporting documentation is located in Appendix C.

Ultimate Development

Cost Description	Alternative 1	Alternative 2
Land Purchase	$ 870,000	$ 870,000
Roads/Drainage/SWM	$1,370,000	$1,452,000
Water System	$1,487,000	$1,544,000
Wastewater System	$1,596,000	$1,755,000
Final Engineering	$ 400,000	$ 400,000
Legal and Administrative	$ 20,000	$ 20,000
Miscellaneous	$ 200,000	$ 200,000
Total	**$5,943,000**	**$6,241,000**
Cost per developed acre (285 acres)	$ 20,853	$ 21,898

The first phase costs were broken out to include items that would be necessary to allow for the development of the first 3-5 lots for each alternative. Each cost represents the construction of approximately 1000 feet of paved road and gravel access for the remainder to the property. This will allow for easier access to the undeveloped portions of the park. Also, each estimate include the phased construction of the sewer treatment plant and the minimal amount of piping needed to provide sewer to each of the developed lots. In order to minimize costs during the first phase of development, it was anticipated that each developed lot would be served by wells for their water needs. The proposed tank and pumps for the future water system can be installed once the remainder of the park is developed. Those lots utilizing wells can connect to the water system once it is installed.

The first phase costs for each alternative are noted below:

Initial Development (Phase I)

Cost Description	Alternative 1	Alternative 2
Land Purchase	$ 870,000	$ 870,000
Roads/Drainage/SWM	$ 362,000	$395,000
Water System	$0	$0
Wastewater System	$646,000	$679,000
Final Engineering	$ 65,000	$ 65,000
Legal and Administrative	$ 10,000	$ 10,000
Miscellaneous	$ 150,000	$ 150,000
Total	**$2,103,000**	**$2,169,000**

9.2 Estimated Economic Impact

An estimate of the park's economic impact was calculated. The economic impact calculations were based on a set of reasonable assumptions regarding the complete development of the park and the jobs and wages which would be generated. The results of the economic impact analysis should serve as a useful indicator of the economic potential of the fully developed industrial park.

The economic impact calculations were based on the methodology used in the 1996 report, "The Economic Impact of Aviation in Virginia," prepared for the Virginia Department of Aviation. The report presented the direct economic impacts for each of the state's airports. An Impact Analysis for Planning (IMPLAN) model, was used to estimate the direct and indirect impacts of employment and wages generated by airports and aviation related businesses in the state. The study developed specific multipliers for specific industry categories in each region of the state. The multipliers were applied to the direct employment and wage estimates, in order to assess the secondary impact of these components of the economy. The Middle Peninsula region was included in Region 9 of the study. In Region 9, for the Government category of industry (including New Industrial & Commercial Construction, Maintenance and Repair, and Engineering and Architectural businesses), the secondary employment multiplier was 1.46 and the secondary payroll multiplier was 1.34. These secondary multipliers were used in the calculations for the industrial park.

The 325-acre industrial site should provide approximately 285 acres of land suitable for development. Each acre of developable land is projected to support 8 jobs per acre. Using these assumptions, the fully developed industrial park would create approximately 2,280 jobs for the Middle Peninsula region. Using the secondary employment multiplier of 1.46, the total employment impact (direct and indirect) of the industrial park was 3,329 jobs (2,280 x 1.46 = 3,329).

In order to project the wages to be generated by the park, the 1997 average wage for King and Queen County was used. The 1997 average annual wage was $20,910, or $402 per week (Bureau of Economic Analysis, U.S. Dept. of Commerce, 1998). Using the projected figure of 3,329 jobs created at the park, $1,338,178 in weekly wages would be generated. Applying the secondary impact multiplier of 1.34 yields an estimated $1,793,158 in total annual economic impact. The direct and indirect impacts of the industrial park employee earnings would generate a total economic impact of over $93M per year (52 weeks x $1,793,158). Appendix B presents the assumptions and calculations of the annual economic impact.

9.3 Estimated Tax Impacts

The potential tax impact of the industrial park was also evaluated. The calculations aim to reflect the potential tax impact per acre of developed property in a total build out scenario (285 developed acres). The tax impact calculation is based on the assumption that the park will generate an average of $277,000 of capital investment per acre. An

average building size of 10,000 sq. ft. was assumed for the 7 parcels sized 10 acres and larger. For the 23 parcels, smaller than 10 acres, a 5,000 sq. ft. building was assumed.

$ 47,000	Real Estate Investment (5,000sf – 10,000sf building, land, improvements)
$150,000	Machinery & Tools Investment
$ 30,000	Personal Property Investment (Road Licensed Vehicles)
$277,000	**Capital Investment per acre**

In King and Queen County, industries are responsible for the following taxes: real estate tax, machinery and tool tax, tangible personal property tax on road licensed vehicles, and industrial utility taxes on electric and telephone bills. The 1999 tax rates for King and Queen County were used to calculate the annual tax impact.

Real Estate Tax-	$ .70 per $100 of Assessed Valuation
Machine and Tool Tax-	$ .99 per $100 of Assessed Valuation
	Percentage of Assessed Value is Taxable based on Age
Personal Property Tax-	$3.94 per $100 of Assessed Valuation
Industrial Utility Tax-	10% on the first $100 of each monthly electric bill
	10% on the first $100 of each monthly telephone bill

Based on a total build out scenario, the current tax rates and the capital investment assumptions listed above, each acre of developable industrial park has the potential to generate $ 3,451 in tax revenue in its first year. The total annual tax impact for the industrial park would be $ 983,535. The tax impact figure is a preliminary estimate and will likely change from year to year, because of the changing assessed value of real estate and personal property, as well as the aging and replacement of machinery and tools. Appendix B presents the assumptions and calculations for the annual tax impact calculations.

9.4 Funding Sources

The development of the park will be eligible for funding from the Virginia Department of Housing and Community Development (DHCD). Through the Industrial Site Development Fund (ISDF), the DHCD provided financial assistance for the preliminary engineering report. Site development assistance is also available through this program. The eligibility requirements for this funding are much the same as those for the preliminary engineering assistance.

Another source of funding for the site development is the VDOT Industrial Park Access Road Program. Funding is available for any site in Virginia, provided that the site has a new or expanding manufacturing, processing or other qualifying establishment already constructed or under firm contract to be built. VDOT will fund the first $300,000 of roadway construction costs at 100% and the next $300,000 at 50%. In addition to roads constructed to VDOT standards, shoulders and ditches are eligible costs. Curbs and gutters, storm sewer systems, sidewalks, additional traffic lanes, medians, lighting, right-of-way, and relocation of utilities are not eligible for this funding.

CHAPTER TEN – EXECUTIVE SUMMARY

10.1 Introduction

The Middle Peninsula Regional Industrial Park consists of 325 undeveloped acres located north of the Middle Peninsula Regional Airport. Two parcels make up the 325 acres and are owned by the Town of West Point and Chesapeake Forest Products Company. Site access is via State Route 33 to State Route 643. The developable acreage for the ultimate build out is 285 acres.

10.2 Airport Industrial Park Case Studies

Four airport industrial parks were studies to provide a representation of the businesses and park configuration. The following parks were studied:

- Chesterfield Airport Industrial Park
- Louisa Industrial Airpark
- Carroll County Air Business Center
- Accomack County Industrial Park

The case studies concluded that smaller parcels, best suited for service, professional and governmental prospects are important for attracting these users. Larger parcels are planned to accommodate light industrial, manufacturing or warehousing. Many of the park tenants utilized the airport for the transport of employees, potential clientele and small goods. Marketing efforts aimed at prospects that have propensity for executive and buyer visitation should be the initial target tenants.

10.3 Site Characteristics

The site has gently rolling to flat topography with predominantly fine, sandy loams. There are no known cultural resources or endangered species within the site boundaries. Wetlands and waters of the U.S. are present on the property and are located predominantly along the northern property line (tributary of Goalders Creek). Chesapeake Bay Preservation Act Resource Protection Areas (RPA) and Resource Management Areas (RMA) are present and, in most cases, are contiguous to the wetlands identified. Wetlands, waters, RPA's and RMA's were identified via a walkover and are not an approved U.S. Corps of Engineers delineation. The majority of the property is located outside the 500-year floodplain. However, portions of Goalders Creek and a tributary in the southwest portion of the property are within the 100-year floodplain. Groundwater is usually obtained from several water-bearing strata occurring between depths of 50 and 200 feet. No hazardous materials were found at the site.

10.4 Site Design Alternatives

Two site layout alternatives were developed.

Alternative 1 Features

- Smaller parcels at the entrance
- Smaller parcels adjacent the airport
- Middle size parcels centrally located along the access main
- Large parcels on higher land along the north boundary
- Excellent mix of small, medium and large parcels
- Excellent relationship to airport area

Alternative 2 Features

- Cluster of smaller lots by the entrance
- Cluster of smaller lots by the airport access
- Cluster of middle size lots centrally located in the east area
- Cluster of middle size lots in the west area
- Four large lots; one centrally located, three on north boundary
- Large number of lots in the 2 to 4 acre range
- Excellent relationship to airport area

10.5 Water/Wastewater Demands and Flows

Water demand estimated at 74,100 gallons per day and wastewater demand estimated at 166,700 gallons per day.

10.6 Water System

Options considered for water service:

- Service from existing utility
- Onsite well to serve entire park
- Individual wells

The central well system with elevated storage is recommended. Water line size of 8".

10.7 Wastewater System

Options considered for wastewater service:

- Service extension from existing utility
- Construct package plant to treat wastewater
- Septic disposal

The package plant to treat wastewater is recommended. Wastewater collection can be accomplished via gravity flow to the package plant.

10.8 Roadways and Drainage

Roadways in park will be designed to accommodate truck traffic based on 500 VPD. Stormwater drainage will be via open ditches and culverts. Stormwater Management BMPs will be located to provide the entire park with the appropriate stormwater quality measures.

10.9 Financial Overview

Preliminary cost opinions were developed for each alternative.

- Alternative 1 $ 5,943,000 (ultimate build out)
- Alternative 2 $ 6,241,000 (ultimate build out)

A first phase which could provide access to 200 acres of the park were estimated. (see Appendix B)

- Alternative 1 $ 2,103,000 (first phase)
- Alternative 2 $ 2,169,000 (first phase)

Economic impact of the ultimate park build out was estimated.

- 3,329 jobs (2,280 direct impact, 1,049 secondary impact)
- $69,585,235 (annual direct wage impact)
- $23,658,960 (annual indirect wage impact)

Estimated tax impacts were calculated for real estate, machinery and tool, and personal property tax. Annual tax impact was estimated to be $3,451 per acre and $983,535 for the entire park.

Potential funding sources for continuing the park development includes the Industrial Site Development Fund and VDOT Industrial Park Access Road Program.

APPENDIX A

SOIL DESCRIPTIONS

Soil Descriptions

1A= Augusta fine sandy loam, 0 to 2 percent slopes, rarely flooded.

Setting
Landform: Stream terraces of the Coastal Plain
Landscape position: Linear, concave treads
Parent material: Loamy alluvial sediments
Size of areas: 5 to 75 acres

Composition
Augusta soil and similar inclusions: 85 to 95 percent.
Dissimilar inclusions: 5 to 15 percent

Inclusions
Dissimilar inclusions:
- Roanoke soils, which are poorly drained and in the lower landscape positions
- Wahee soils, which have more clay in the subsoil than the Augusta soil and are in similar landscape positions.

Similar inclusions:
- Munden and Tetotum soils, which are moderately well drained and in landscapes positions higher than those of the Augusta soil
- Tomotley soils, which are poorly drained and in the lower landscape positions

Typical Profile
Surface layer:
0 to 6 inches = yellowish brown fine sandy loam

Subsurface layer:
6 to 9 inches = yellowish brown fine sandy loam that has grayish brown and yellowish masses of iron accumulation

Subsoil:
9 to 19 inches = light grayish brown sandy clay loam that has gray iron depletions and light yellowish brown masses of iron accumulation
19 to 39 inches = light brownish gray clay loam that has light yellowish brown and yellowish brown masses of iron accumulation
39 to 45 inches = light brownish gray clay loam
45 to 60 inches = gray sandy clay loam that has yellowish brown masses of iron accumulation

Substratum:
60 to 70 inches = gray loam sand

2B = Bojac loam sand, 2 to 6 percent slopes, rarely flooded

Setting
Landform: Stream terraces of the Coastal Plain
Landscape position: Gently sloping, convex treads
Size of areas: 5 to 50 acres

Composition
Bojac soil and similar inclusions: 85 to 95 percent
Dissimilar inclusions: 5 to 15 percent

Inclusions
Dissimilar inclusions:

- Tarboro soils, which are somewhat excessively drained, are sandy throughout, and are in landscape positions similar to those of the Bojac soil
- Craven and Tetotum soils, which are moderately well drained and in the lower landscape positions

Similar inclusions:

- Munden soils, which are moderately well drained, have more clay in the subsoil than the Bojac soil, and are in the lower, linear or concave areas
- State soils, which have more clay in the subsoil than the Bojac soil and are in similar landscape positions
- Bojac soils that have a cobbly or gravelly surface layer and are in landscape positions similar to those of the major soil

Typical Profile
Surface layer:
0 to 10 inches = yellowish brown loamy sand

Subsoil:
10 to 18 inches = yellowish brown sandy loam
18 to 27 inches = light yellowish brown sandy loam
27 to 35 inches = brownish yellow sandy loam
35 to 49 inches = brownish yellow sandy loam that has light yellowish brown masses of iron accumulation
49 to 55 inches = light yellowish brown loamy sand that has brownish yellow masses of iron accumulation

Substratum:
55 to 62 inches = brownish yellow loamy sand that has light gray iron depletions
16A = State fine sandy loam, 0 to 2 percent slopes

Setting
Landform: Stream terraces of the Coastal Plain
Landscape position: Convex treads

Parent material: Loamy fluvial sediments
Size of areas: 5 to 150 acres

Composition
State soil and similar inclusions: 85 to 95 percent
Dissimilar inclusions: 5 to 15 percent

Inclusions
Dissimilar inclusions:

- Craven soils, which are moderately well drained, have more clay than the State soil, and are in the higher concave areas
- Munden soils, which are moderately well drained, have more clay than the State soil, and are in the lower landscape positions
- Tarboro soils, which are somewhat excessively drained, have less clay than the State soil, and are in the slightly lower landscape positions

Similar inclusions:

- Bojac soils, which are well drained, have less clay in the subsoil than the State soil, and are in similar landscape positions
- Tetotum soils, which are moderately well drained, have more clay than the State soil, and are in the lower landscape positions

Typical Profile
Surface layer:
0 to 8 inches = brown fine sandy loam

Subsurface layer:
8 to 17 inches = light yellowish brown loamy fine sand

Subsoil:
17 to 28 inches = yellowish brown sandy clay loam
28 to 36 inches = yellowish brown sandy loam

Substratum:
36 to 46 inches = yellowish brown loamy fine sand
46 to 56 inches = brownish yellow and very pale brown loamy sand that has strong brown lamellae
56 to 62 inches = olive yellow and very pale brown loamy fine sand

19A = Tetotum fine sandy loam, 0 to 2 percent slopes, rarely flooded

Setting
Landform: Stream terraces of the Coastal Plain
Landscape position: Linear, convex treads

Parent material: Moderately fine textured fluvial sediments overlying stratified, coarse to medium textured sediments
Size of areas: 5 to 75 acres

Composition
Tetotum soil and similar inclusions: 85 to 95 percent
Dissimilar inclusions: 5 to 15 percent

Inclusions
Dissimilar inclusions:

- Bojac soils, which are well drained and in the higher landscape positions
- Craven soils, which are moderately well drained, have more clay in the subsoil than the Tetotum soil, and are in similar landscape positions
- Tarboro soils, which are somewhat excessively drained, have less clay than the Tetotum soil, and are in the higher landscape positions
- Wahee soils, which are somewhat poorly drained, have more clay in the subsoil than the Tetotum soil, and are in the slightly lower, concave landscape positions

Similar inclusions:

- Augusta soils, which are somewhat poorly drained and in concave landscape positions
- Munden soils, which have less clay in the subsoil than the Tetotum soil and are in similar landscape positions
- State soils, which are well drained and in convex landscape positions

Typical Profile
Surface layer:
0 to 8 inches = dark brown find sandy loam

Subsurface layer:
8 to 12 inches = light yellowish brown fine sandy loam

Subsoil:
12 to 18 inches = yellowish brown loam that has light yellowish brown iron depletions and strong brown masses of iron accumulation
18 to 25 inches = yellowish brown loam that has strong brown masses of iron accumulation

25 to 32 inches = yellowish brown sandy clay loam that has light yellowish brown and light brownish gray iron depletions
32 to 49 inches = light yellowish brown, yellowish brown, and light brownish gray sandy loam

Substratum:
49 to 56 inches = yellowish brown and yellow sand
56 to 62 inches = yellowish brown and yellow sand
19B = Tetotum fine sandy loam, 2 to 6 percent slopes, rarely flooded

Setting
Landform: Stream terraces of the Coastal Plain
Landscape position: Linear, convex treads
Parent material: Moderately fine textured fluvial sediments overlying stratified, coarse to medium textured sediments
Size of areas: 5 to 50 acres

Composition
Tetotum soil and similar inclusions: 85 to 95 percent
Dissimilar inclusions: 5 to 15 percent

Inclusions
Dissimilar inclusions:

- Bojac soils, which are well drained and in the higher landscape positions
- Craven soils, which are moderately well drained, have more clay in the subsoil than the Tetotum soil, and are in similar landscape positions
- Tarboro soils, which are somewhat excessively drained, have less clay than the Tetotum soil, and are in the higher landscape positions
- Wahee soils, which are somewhat poorly drained, have more clay in the subsoil than the Tetotum soil, and are in the slightly lower, concave landscape positions

Similar inclusions:

- Augusta soils, which are somewhat poorly drained and in concave landscape positions
- Munden soils, which have less clay in the subsoil than the Tetotum soil and are in similar landscape positions
- State soils, which are well drained and in convex landscape positions

Typical Profile
Surface layer:
0 to 8 inches = dark brown fine sandy loam

Subsurface layer:
8 to 12 inches = light yellowish brown fine sandy loam

Subsoil:
12 to 18 inches = yellowish brown loam that has light yellowish brown iron depletions and strong brown masses of iron accumulation

18 to 25 inches = yellowish brown loam that has strong brown masses of iron accumulation
25 to 32 inches = yellowish brown sandy clay loam that has light yellowish brown and light brownish gray iron depletions
32 to 49 inches = light yellowish brown, yellowish brown, and light brownish gray sandy loam

Substratum:
49 to 56 inches = yellowish brown and yellow sand
56 to 62 inches = yellowish brown and yellow sand

APPENDIX B

ECONOMIC IMPACT & ANNUAL TAX IMPACT CALCULATIONS

Economic Impact Assumptions:

1) The calculations were based on the methodology used in the 1996 report, "The Economic Impact of Aviation in the Commonwealth of Virginia." The report was prepared for the Department of Aviation and presented the economic impact of each airport in the Virginia Air Transportation System. To estimate the secondary impact of employment and wages as they circulate through the economy, the study developed specific multipliers. Employment and wages directly generated by an airport were then multiplied by a factor to generate an estimate of secondary impact.

2) Estimated jobs per acre- 8

   A conservative figure was used, because jobs per acre can vary greatly among different industries. Employee density in industrial parks is highly variable because of the mixing of industrial and business activities, often within the same building. Businesses with the lowest employee density are highly automated industries or warehouses, which often support fewer than five employees per acre. Light service industries located on small parcels generally have 5 to 20 employees per acre. The most intensive uses are research and development activities and offices, which may support more than 100 employees per acre.

   Source: Business and Industrial Park Handbook, Urban Land Institute, 1988.

3) Secondary Employment Multiplier- 1.46
   Secondary Wage Multiplier- 1.34

   Through an analysis of employment and wage data, secondary multipliers were developed for different business categories and for different regions. The Middle Peninsula region was included in "Region 9" of the study. The study's "Government" industry category, represented the new industrial & commercial construction businesses, maintenance and repair businesses, and Engineering & Architecture firms. We used the multipliers for the Government category, in our calculation.

   Source: "Economic Impact of Aviation in the Commonwealth of Virginia," 1996.

4) Average Weekly Wage- $402

   This is 1997 average weekly wage for King and Queen County.

   Source: Bureau of Economic Analysis, U.S. Department of Commerce, 1998.

Employment Impact

Jobs per Developed per Acre	Number of Developed Acres	Direct Employment (jobs)	Secondary Impact Multiplier	Total Employment Impact
8	285	2,280	1.46	3,329

Wage Impact

Total Employment	Average Weekly Wage	Total Weekly Wages	Secondary Impact Multiplier	Total Weekly Wage Impact	Total Annual Wage Impact
3,329	$ 402	$ 1,338,178	1.34	$ 1,793,158	$ 93,244,216

Annual Direct Economic Impact ($1,338,178 x 52)= $ 69,585,256
Annual Indirect Economic Impact ($454,980 x 52)= $ 23,658,960

Tax Impact Calculations Assumptions:

1) There are 285 developable acres in the park. The site design for Alternative 1, is made up of 30 lots. The calculation reflects the tax impact of the built out park.

   7 lots- 10 acres or larger in size.
   23 lots- Less than 10 acres in size.

2) ± 10 acre lots = Warehouse/Mftg. Uses (Avg. Building Size- 10,000sf)
   Less than 10 acre lots = Office/Service Parcels (Avg. Building Size- 5,000sf)

   Based on a sampling of other industrial park projects, Warehouse/Manufacturing buildings range in size from 10,000sf to 30,000sf. Office/Service buildings range in size from 5,000sf to 10,000sf.

   Source: Business and Industrial Park Development Handbook, Urban Land Institute, 1988.

Building Investment

Lot Use	Lot Size	No. of Parcels	Avg. Bldg. Size (sf)	Total Bldg. Space (sf)	Cost per sf	Total Bldg. Investment
Warehse/Mftg	± 10	7	10,000	70,000	$ 35	$ 2,450,000
Office/Service	< 10	23	5,000	115,000	$ 35	$ 4,025,000
			TOTAL	185,000		**$ 6,475,000**

Parking/Paving Requirements

Lot Use	Total Bldg. Space (sf)	Parking Spaces per sf*	Total Parking Spaces
Warehse/Mftg	70,000	2	140
Office/Service	115,000	4	460
TOTAL	185,000		600

* Source: ITE Trip Generation, *Fourth Edition*, Institute of Transportation Engineers, 1987.

Parking/Paving Investment

Total Parking Spaces	Parking Space Dimensions*	Total Pavement (sf)	Total Pavement (sy)	Cost per sy	Total Investment
600	270	162,000	6,889	$ 15	**$ 103,335**

* Includes allowance for travel lane space.

Land/Development Investment

Land Cost	Development Cost (Alternative 1)	Total Investment
$ 870,000	$ 5,943,000	$ 6,813,000

Total Real Estate Investment

Total Building Investment	Total Paving Investment	Total Land/Dev. Investment	Total Investment (285 acres)	Investment per Dev. acre
$ 6,475,000	$ 103,335	$ 6,813,000	$ 13,391,335	$ 47,000

Estimated Capital Investment Per Acre

$ 47,000	Real Estate
$ 150,000	Machinery & Tools
$ 30,000	Personal Property (Road Licensed Vehicles)
$ 277,000	Total Capital Investment per acre

1999 Tax Rates, King and Queen County

Real Property Tax: $ 0.70 per $100 assessed value

The nominal tax rate was used.

Machinery and Tool Tax: $ 0.99 per $100 of 70% of assessed value

The percentage of the assessed value, which is taxable, is based on the age of the equipment. In year one, 70 percent of the machinery's assessed value is taxable. The taxable percentage decreases as machinery ages. Machinery 7 years and older is subject to taxes on 10% of its assessed value.

Personal Property Tax: $ 3.94 per $100 assessed value

Industrial Utility Tax: 10% on the first $100 of each monthly electric bill.
10% on the first $100 of each monthly telephone bill.

An average monthly electric bill of $500/acre is assumed. ($50/month, $600/year)
An average monthly telephone bill of $250/acre is assumed. ($25/month, $300/year)

Source: A Virginia Guide to Local Taxes on Businesses, Virginia Economic Development Partnership, July 1998.

Annual Tax Impact per acre:

$ 329	Real Estate
$ 1,040	Machinery & Tools
$ 1,182	Personal Property (Road Licensed Vehicles)
$ 900	Industrial Utility
$ 3,451	**Annual Tax Impact per acre**

Annual Tax Impact- Total Buildout (285 x $3,451) = $ 983,535

APPENDIX C

PROJECT ESTIMATES

ROADS/DRAINAGE/STORMWATER MANAGEMENT
Opinion of Probable Cost
Middle Peninsula Industrial Park
Alternative 1

Item No.	Description	Unit	Quantity	Unit Price	Total
1	Clearing and Grubbing	AC	14	$1,500.00	$21,000.00
2	Earthworks				
	Cut as Fill	CY	17600	$12.00	$201,200.00
3	Pavement				
	2" SM-2A	TN	3036	$45.00	$136,620.00
	3" BM-2	TN	4554	$45.00	$204,930.00
	8" 21B Stone	TN	11880	$18.00	$213,840.00
4	Drainage (10% of Pavt.+ Earthworks)	LS	1		$75,659.00
5	Curb and Gutter	LF	1000	$15.00	$15,000.00
6	Erosion Control	LS	1	$75,000.00	$75,000.00
7	Seeding and Mulching	AC	6	$1,500.00	$9,000.00
8	Wetland Mitigation	AC	10	$11,000.00	$110,000.00
9	Mobilization	LS	1	$150,000.00	$150,000.00
10	Miscellaneous (10%)	LS	1	$150,000.00	$150,000.00
				Total	$1,362,249.00
				USE	$1,370,000.00

ROADS/DRAINAGE/STORMWATER MANAGEMENT
Opinion of Probable Cost
Middle Peninsula Industrial Park
Alternative 2

Item No.	Description	Unit	Quantity	Unit Price	Total
1	Clearing and Grubbing	AC	15	$1,500.00	$22,500.00
2	Earthworks				
	Cut as Fill	CY	19200	$12.00	$230,400.00
3	Pavement				
	2" SM-2A	TN	3312	$45.00	$149,040.00
	3" BM-2	TN	4968	$45.00	$223,560.00
	8" 21B Stone	TN	12960	$18.00	$233,280.00
4	Drainage (10% of Pavt.+ Earthworks)	LS	1		$83,628.00
5	Curb and Gutter	LF	1000	$15.00	$15,000.00
6	Erosion Control	LS	1	$75,000.00	$75,000.00
7	Seeding and Mulching	AC	6	$1,500.00	$9,000.00
8	Wetland Mitigation	AC	10	$11,000.00	$110,000.00
9	Mobilization	LS	1	$150,000.00	$150,000.00
10	Miscellaneous (10%)	LS	1	$150,000.00	$150,000.00
				Total	$1,451,408.00
				USE	$1,452,000.00

WATER INFRASTRUCTURE
Opinion of Probable Cost
Middle Peninsula Industrial Park
Alternative 1

8" PVC	UNIT	QUANTITY	UNIT PRICE	TOTAL
LENGTH PVC	LF	9100	$ 17.14	$155,974.00
VALVE	EA	9	$1,075.00	$ 9,675.00
45, 22 1/2, OR ¼ BENDS	EA	6	$ 251.00	$ 1,506.00
TEE	EA	3	$ 281.00	$ 843.00
BLIND FLANG/PLUG	EA	2	$ 240.00	$ 480.00
FIRE HYDRANT (COMPLETE)	EA	9	$3,785.00	$ 34,065.00
CLEAR, AND GRUB	LF	9100	$ 8.80	$ 80,080.00
SUBTOTAL				$282,623.00

ENGINEERING, CONTINGENCY	$70,656
TOTAL COST	**$353,279**

Note – Cost of service installations not included.

WASTEWATER INFRASTRUCTURE
Opinion of Probable Cost
Middle Peninsula Industrial Park
Alternative 1

8" PVC	UNIT	QUANTITY	UNIT PRICE	TOTAL
CUT 6-8	LF	1200	$ 27.57	$ 33,084.00
CUT 8-10	LF	4100	$ 36.52	$149,732.00
CUT 10-12	LF	1200	$ 38.87	$ 46,644.00
CUT 12-15	LF	200	$ 47.22	$ 9,444.00
# OF MH DEPTH 0-6	EA	1	$2,055.00	$ 2,055.00
# OF MH DEPTH 6-8	EA	5	$2,675.00	$ 13,375.00
3 OD MH DEPTH 8-10	EA	2	$3,225.00	$ 6,450.00
# OF MH DEPTH 10-12	EA	1	$3,525.00	$ 3,525.00
# OF MH DEPTH 12-15	EA	1	$4,900.00	$ 4,900.00
# SERVICE CONNECTIONS PVC	EA	25	$ 622.80	$ 15,570.00
CLEAR, AND GRUB	LF	8700	$ 8.80	$ 76,560.00
SUBTOTAL				$361,399.00

ENGINEERING, CONTINGENCY	$90,335.00
TOTAL COST	$451,734

10" PVC	UNIT	QUANTITY	UNIT PRICE	TOTAL
CUT 6-8	LF	2000	$ 38.11	$76,220.00
# SERVICE CONNECTIONS PVC	EA	5	$622.68	$ 3,114.00
SUBTOTAL				$79,334.00

ENGINEERING, CONTINGENCY	$ 19,834.00
TOTAL COST	**$99,168.00**
TOTAL PROJECT COST	**$550,902.00**

WATER INFRASTRUCTURE
Opinion of Probable Cost
Middle Peninsula Industrial Park
Alternative 2

8" PVC	UNIT	QUANTITY	UNIT PRICE	TOTAL
LENGTH PVC	LF	10650	$ 17.14	$182,541.00
VALVE	EA	10	$1,075.00	$ 10,750.00
45, 22 1/2, OR ¼ BENDS	EA	5	$ 251.00	$ 1,255.00
TEE	EA	5	$ 281.00	$ 1,405.00
BLIND FLANG/PLUG	EA	4	$ 240.00	$ 960.00
FIRE HYDRANT (COMPLETE)	EA	10	$3,785.00	$ 37,850.00
CLEAR, AND GRUB	LF	10650	$ 8.80	$ 93,720.00
SUBTOTAL				$328,481.00

ENGINEERING, CONTINGENCY	$82,120.00
TOTAL COST	**$410,601.00**

Note – Cost of service installations not included.

WASTEWATER INFRASTRUCTURE
Opinion of Probable Cost
Middle Peninsula Industrial Park
Alternative 2

8"PVC	UNIT	QUANTITY	UNIT PRICE	TOTAL
CUT 6-8	LF	5100	$ 27.57	$140,607.00
CUT 8-10	LF	1200	$ 36.52	$ 43,824.00
CUT 10-12	LF	1400	$ 38.87	$ 54,418.00
CUT 12-15	LF	400	$ 47.22	$ 18,888.00
CUT 15-18	LF	1400	$ 64.07	$ 89,698.00
# OF MH DEPTH 0-6	EA	5	$ 2,055.00	$ 10,275.00
# OF MH DEPTH 6-8	EA	8	$ 2,675.00	$ 21,400.00
3 OD MH DEPTH 8-10	EA	4	$ 3,225.00	$ 12,900.00
# OF MH DEPTH 10-12	EA	1	$ 3,525.00	$ 3,525.00
# OF MH DEPTH 12-15	EA	1	$ 4,900.00	$ 4,900.00
# OF MH DEPTH 15-18	EA	1	$ 7,350.00	$ 7,350.00
# SERVICE CONNECTIONS PVC	EA	33	$ 622.80	$ 20,552.40
CLEAR, AND GRUB	LF	10700	$ 8.80	$ 94,160.00
SUBTOTAL				$522,497.40

ENGINEERING, CONTINGENCY $130,624

TOTAL COST $653,121

10" PVC	UNIT	QUANTITY	UNIT PRICE	TOTAL
CUT 6-8	LF	600	$ 29.16	$17,496.00
CUT 8-10	LF	600	$ 38.11	$22,866.00
# SERVICE CONNECTIONS PVC	EA	7	$622.80	$ 4,359.60
SUBTOTAL				$44,722.00

ENGINEERING, CONTINGENCY $11,180.00

TOTAL COST **$ 55,902.00**

TOTAL PROJECT COST **$709,023.00**

Middle Peninsula Industrial Park
Cost Estimates

Item	Alternative 1	Alternative 2
Water Infrastructure	$ 354,000	$ 411,000
Elevated Water Tank	$ 429,000	$ 429,000 (1)
Ground Storage Tank	$ 254,000	$ 254,000 (2)
Water Pump Station and Well	$ 450,000	$ 450,000
Water Total	$1,487,000	$1,544,000
Wastewater Infrastructure	$551,000	$710,000
Wastewater Plant	$1,045,000	$1,045,000 (3)
Wastewater Total	$1,596,000	$1,755,000

(1) The elevated water tank estimate was multiplied by 1.2 to include engineering and Contingencies
(2) The ground storage tank estimate was multiplied by 1.2 to include engineering and Contingencies
(3) Wastewater plant is $835,000 multiplied by 1.25 for engineering and contingencies

ROADS/DRAINAGE/STORMWATER MANAGEMENT
Opinion of Probable Cost
Middle Peninsula Industrial Park
Alternate 1 (Phase I)

Item No.	Description	Unit	Quantity	Unit Price	Total
1	Clearing and Grubbing	AC	14	$1,500.00	$21,000.00
2	Earthworks				
	Cut as Fill	CY	1800	$12.00	$21,600.00
3	Pavement				
	2" SM-2A	TN	320	$45.00	$14,400.00
	6" BM-2	TN	950	$45.00	$42,750.00
	12" 21B Stone	TN	9720	$18.00	$174,960.00
4	Drainage (10% of Pavt. + Earthworks	LS	1		$25,371.00
5	Curb and Gutter	LF	500	$15.00	$7,500.00
6	Erosion Control	LS	1	$20,000.00	$20,000.00
7	Seeding and Mulching	AC	1	$1,500.00	$1,500.00
8	Wetland Mitigation	AC	0	$11,000.00	$0.00
9	Mobilization	LS	1		$32,908.10
			Total		$361,989.10
			USE		$362,000.00

ROADS/DRAINAGE/STORMWATER MANAGEMENT
Opinion of Probable Cost
Middle Peninsula Industrial Park
Alternate 2 (Phase I)

Item No.	Description	Unit	Quantity	Unit Price	Total
1	Clearing and Grubbing	AC	15	$1,500.00	$22,500.00
2	Earthworks				
	Cut as Fill	CY	1800	$12.00	$21,600.00
3	Pavement				
	2" SM-2A	TN	320	$45.00	$14,400.00
	6" BM-2	TN	950	$45.00	$42,750.00
	12" 21B Stone	TN	10620	$18.00	$191,160.00
4	Drainage (10% of Pavt. + Earthworks	LS	1		$26,991.00
5	Curb and Gutter	LF	500	$15.00	$7,500.00
6	Erosion Control	LS	1	$20,000.00	$20,000.00
7	Seeding and Mulching	AC	1	$1,500.00	$1,500.00
8	Wetland Mitigation	AC	1	$11,000.00	$11,000.00
9	Mobilization	LS	1		$35,940.10
			Total		$395,341.10
			USE		$395,000.00

WATER INFRASTRUCTURE
Opinion of Probable Cost
Middle Peninsula Industrial Park
Alternative 1 (Phase I)

8" PVC	UNIT	QUANTITY	UNIT PRICE	TOTAL
LENGTH PVC	LF	1800	$ 17.14	$ 30,852.00
VALVE	EA	2	$1,075.00	$ 2,150.00
45, 22 1/2, OR ¼ BENDS	EA	2	$ 251.00	$ 502.00
TEE	EA	1	$ 281.00	$ 281.00
BLIND FLANG/PLUG	EA	1	$ 240.00	$ 240.00
FIRE HYDRANT (COMPLETE)	EA	3	$3,785.00	$ 11,355.00
CLEAR, AND GRUB	LF	1800	$ 8.80	$ 15,840.00
SUBTOTAL				$ 61,220.00

ENGINEERING, CONTINGENCY	$15,305
TOTAL COST	**$76,525**

Note – Cost of service installations not included.

WASTEWATER INFRASTRUCTURE
Opinion of Probable Cost
Middle Peninsula Industrial Park
Alternative 1 (Phase I)

8" PVC	UNIT	QUANTITY	UNIT PRICE	TOTAL
# OF MH DEPTH 6-8	EA	2	$2,675.00	$ 5,350.00
3 OD MH DEPTH 8-10	EA	2	$3,225.00	$ 6,450.00
# OF MH DEPTH 10-12	EA	1	$3,525.00	$ 3,525.00
# OF MH DEPTH 12-15	EA	1	$4,900.00	$ 4,900.00
# SERVICE CONNECTIONS PVC	EA	6	$ 622.80	$ 3,736.80
CLEAR, AND GRUB	LF	1900	$ 8.80	$ 16,720.00
SUBTOTAL				$ 40,681.80

ENGINEERING, CONTINGENCY $10,170.00

TOTAL COST $ 50,852

10" PVC	UNIT	QUANTITY	UNIT PRICE	TOTAL
CUT 6-8	LF	1900	$ 38.11	$72,409.00
# SERVICE CONNECTIONS PVC	EA	5	$622.68	$ 3,114.00
SUBTOTAL				$75,523.00

ENGINEERING, CONTINGENCY $ 18,881.00

TOTAL COST **$94,404.00**

TOTAL PROJECT COST **$145,256.00**

WATER INFRASTRUCTURE
Opinion of Probable Cost
Middle Peninsula Industrial Park
Alternative 2 (Phase I)

8" PVC	UNIT	QUANTITY	UNIT PRICE	TOTAL
LENGTH PVC	LF	2100	$ 17.14	$ 35,994.00
VALVE	EA	3	$1,075.00	$ 3,225.00
45, 22 1/2, OR ¼ BENDS	EA	3	$ 251.00	$ 753.00
TEE	EA	1	$ 281.00	$ 281.00
BLIND FLANG/PLUG	EA	2	$ 240.00	$ 480.00
FIRE HYDRANT (COMPLETE)	EA	4	$3,785.00	$ 15,140.00
CLEAR, AND GRUB	LF	2100	$ 8.80	$ 18,480.00
SUBTOTAL				$ 74,353.00

ENGINEERING, CONTINGENCY	$18,588.00
TOTAL COST	**$92,941.00**

Note – Cost of service installations not included.

WASTEWATER INFRASTRUCTURE
Opinion of Probable Cost
Middle Peninsula Industrial Park
Alternative 2 (Phase I)

8"PVC	UNIT	QUANTITY	UNIT PRICE	TOTAL
CUT 15-18	LF	800	$ 64.07	$ 51,256.00
3 OD MH DEPTH 8-10	EA	3	$ 3,225.00	$ 9,675.00
# OF MH DEPTH 10-12	EA	1	$ 3,525.00	$ 3,525.00
# OF MH DEPTH 12-15	EA	1	$ 4,900.00	$ 4,900.00
# OF MH DEPTH 15-18	EA	1	$ 7,350.00	$ 7,350.00
# SERVICE CONNECTIONS PVC	EA	6	$ 622.80	$ 3,736.80
CLEAR, AND GRUB	LF	2000	$ 8.80	$ 17,600.00
SUBTOTAL				$ 98,042.80

ENGINEERING, CONTINGENCY $24,511

TOTAL COST $122,554

10" PVC	UNIT	QUANTITY	UNIT PRICE	TOTAL
CUT 6-8	LF	600	$ 29.16	$17,496.00
CUT 8-10	LF	600	$ 38.11	$22,866.00
# SERVICE CONNECTIONS PVC	EA	7	$622.80	$ 4,359.60
SUBTOTAL				$44,722.00

ENGINEERING, CONTINGENCY $11,180.00

TOTAL COST **$ 55,902.00**

TOTAL PROJECT COST **$178,456.00**

Middle Peninsula Industrial Park
Cost Estimates

Item	Alternative 1 (Phase I)	Alternative 2 (Phase I)
Water Infrastructure	$ 0	$ 0
Elevated Water Tank	$ 0	$ 0
Ground Storage Tank	$ 0	$ 0
Water Pump Station and Well	$ 0	$ 0
Water Total	$ 0	$ 0 (*)
Wastewater Infrastructure	$ 146,000	$ 179,000
Wastewater Plant	$ 500,000	$ 500,000
Wastewater Total	$ 646,000	$ 679,000

(*) In the first phase of development, it is anticipated that the tenants will be utilizing a well system for their water requirements. Therefore, first phase construction cost of water facilities will be $0.00.

APPENDIX E

Spotsylvania County Comprehensive Plan
Future Land Use Map

Spotsylvania County Future Land Use

Legend

- Primary Development Boundary
- Water

Land Use Designations

Categories

- Open Space
- Institutional
- Commercial Land Use
- Employment Centers
- Mixed Land Use
- High Density Residential Land Use
- Low Density Residential Land Use
- Rural Residential Land Use
- Agricultural and Forestal Land Use

0 0.5 1 2 3 Miles

1 in = 1 miles

Map Approved: November 14, 2013

APPENDIX F

Stafford County Comprehensive Plan

Land Use Concept

Figure 3.7.2-A provides a generalized land use concept plan to guide the future development of the Courthouse Planning Area.