

APPENDIX I

Preliminary Engineering Report



**DELTA AIRPORT
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PRELIMINARY ENGINEERING REPORT

for

ENVIRONMENTAL ASSESSMENT: EXTEND RUNWAY 15-33 & OTHER DEVELOPMENT PROJECTS

CHESTERFIELD COUNTY AIRPORT
RICHMOND, VIRGINIA

Airport Project No. 3-51-0007-23
DOAV Project No. CF0007-23
Delta Project No. 10086

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APRIL 2014

**PRELIMINARY DESIGN REPORT
ENVIRONMENTAL ASSESSMENT**

CHESTERFIELD COUNTY AIRPORT

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ENVIRONMENTAL ASSESSMENT

CHESTERFIELD COUNTY AIRPORT RICHMOND, VA

AIP PROJECT NO. 3-51-0007-023-2012

DELTA PROJECT NO. 10086

APRIL 2014

I. PROJECT SUMMARY

As part of the Environmental Assessment (EA) for the proposed projects at the Chesterfield County Airport, this task involves conducting Preliminary Design Engineering for the projects and associated alternatives evaluated within the EA. This preliminary design includes the following:

For each development alternative:

- Design Parameters
- Construction Challenges

For the preferred development alternative:

- Geometric design standards and pavement limits
- Grading design standards
- Grading limits/Limits of disturbance
- Airspace requirements
- Estimated electrical loads
- Traffic mix for pavements designs
- Potential utility conflicts
- Potential environmental or historical impacts
- Offsite property impacts
- Quantities and Cost estimates

II. DESCRIPTION OF WORK

The projects being considered for development are as follows:

- Existing Obstruction Removal
 - Install Obstruction Lights
 - Land Acquisition – Easement (for Obstruction Removal)



- Runway Development Alternatives
 - Alternative 1 – No Action
 - Alternative 2 – Extend the runway and parallel taxiway 800 feet to the north
 1. Land Acquisition - Fee Simple and Easement
 2. Future Obstruction Removal
 3. Construct Standard RSA
 4. Construct Blast Pads
 5. Construct Taxiway Turn-around/Hold Apron
 6. Install Runway 15 MALSR
 7. Relocate Localizer and PAPI
 8. Relocate Power Lines (Underground)
 - Alternative 3 – Extend the runway and parallel taxiway 600 feet to the north and 200 feet to the south
 1. Land Acquisition - Fee Simple and Easement
 2. Future Obstruction Removal
 3. Construct Standard RSA
 4. Construct Blast Pads
 5. Construct Taxiway Turn-around/Hold Apron
 6. Install Runway 15 MALSR
 7. Relocate Localizer and PAPIs
 8. Relocate Power Lines (Underground)
 9. Relocate Runway 33 MALSR (if declared distances are not established)
 10. Relocate Glide Slope (if declared distances are not established)
 11. Relocate Whitepine Road

- Hangar Construction
 - Construct One (1) 10-Unit T-Hangar (Large)
 - Construct Three (3) Conventional Hangars

- Relocate Glide Slope Equipment (outside ROFA on the west side)

- Fuel Farm Improvement

- Replace Rotating Beacon

The preferred runway extension alternative and other development projects as depicted on the Airport Layout Plan (ALP) are anticipated to be initiated within five years following the issuance of finding on the EA. The projects are currently included in the Airport Capital Improvement Program (ACIP). The development alternatives are depicted in **Exhibit 1**, Appendix B of this report.



III. DEVELOPMENT ALTERNATIVES

Three alternatives for the runway extension project were developed and evaluated during the 2011 Master Plan Update. This report will discuss the alternatives and provide more detailed descriptions of earthwork, phasing, drainage, wetlands, quantities, cost estimates, and the advantages and disadvantages of each alternative.

A. Development Alternative 1 – No Action

Alternative 1, the No Action option, assumes the runway would remain as it is today. Alternative 1 is depicted in **Exhibit 2**, Appendix B.

1. Advantages

- Least cost alternative

2. Disadvantages

- Does not meet FAA design standards
 - As of September 2012, the runway longitudinal grade does not meet current standard
- Does not achieve the recommended runway length of 6,300 feet
- Does not provide control of existing RPZs
- Does not mitigate existing obstructions

B. Development Alternative 2 – Extend runway and parallel taxiway 800' to the North and Common Development Projects

Alternative 2 consists of constructing an 800 foot extension of Runway 15-33 off the end of Runway 15 as shown on **Exhibit 3**, Appendix B. The project would entail constructing an 800 foot runway extension, extension of the parallel taxiway, construction of a hold apron, blast pad construction, relocation of the localizer equipment, PAPI relocation, natural gas pipeline valve station relocation, safety area grading, obstruction removal, and land acquisition. This alternative also includes all the Common Development Projects discussed in Section D.





EXISTING RUNWAY 15 END

1. Land Acquisition

The County does not control all property within the proposed Runway 15 RPZ. There are 11 property owner's affected by the Runway 15 land acquisition. Approximately 44 acres of fee simple is required to control the Runway 15 RPZ. Approximately 15 acres of aviation easement acquisition is required for obstruction removal. There are two private residences and a church that are affected by the fee simple acquisition. The proposed land acquisition Runway Development Alternative 2 is depicted in **Exhibit 4**, Appendix B.

2. Obstruction Removal

There are obstructions to the existing and proposed Part 77 surfaces to be removed from both on airport property and off. There are existing off airport obstructions to the Transitional Surface west of the runway that will continue to be mitigated by obstruction lights. Several of the obstruction removal areas are proposed to impact wetlands. This study identified obstruction removal off the end of Runway 15, beyond those identified in the ALP, associated with removing trees for the proposed Runway 15 MALSR. The proposed obstruction removal is depicted on **Exhibit 5**, Appendix B. Additional obstruction removal related to the common development projects is depicted on **Exhibit 6**, Appendix B.

Of the approximately 22 acres of proposed obstruction removal for the runway extension, approximately 5 acres of wetlands are proposed to be affected. All 5 acres of wetlands are proposed to be cleared flush to the ground with no impact to the stumps or root mat.



3. Grading

To prepare the preliminary grades and help determine the grading limits, 1 foot contours of the northern end of the Airport were provided by Woolpert. **Exhibit 7**, Appendix B documents of the completed survey. The extension of the runway and taxiway will require significant embankment material. The proposed runway and safety area longitudinal profile is depicted on **Exhibit 8**, Appendix B. Based on recent previous construction projects, the existing on-site borrow material is not adequate for embankment beneath pavement. Embankment material from off airport property will be required for the project. Existing on-site material should be sufficient for safety area and non-critical areas.

Of the area to be graded for the runway extension, approximately 0.8 acres of wetlands are proposed to be impacted. All 0.8 acres of wetlands are proposed to be cleared, grubbed, and graded to drain in order to meet FAA design standards.

4. Runway Grade Correction

The extension of the runway will result in the last quarter of the runway on the Runway 33 end to extend 200 feet to the north. The extension will result in the presence of a vertical curve within the last quarter of the Runway 33 end which is not allowed under current design standards in AC 150/5300-13A. In order to relocate the vertical curve outside the last quarter, approximately 2,500 feet of the runway pavement will require grade correction including a pavement overlay. The grade correction will require approximately 800 linear feet of milling of one to two inches and overlay thickness up to approximately 13 inches. Due in part to the thick overlay during the last rehabilitation project, the milling depth is minor enough such that reconstruction should not be possible to meet the required pavement thickness and strength. Connector Taxiway E will also have to be overlaid to meet grading standards. In areas where there is a thick overlay, the existing safety area will need to be regarded to meet standard. Since the existing safety areas already are graded to the maximum extent possible, the safety areas will have to be graded the entire width in those areas.

Since the runway recently underwent a rehabilitative overlay, it is recommended that the grade correction be completed at the next scheduled runway rehabilitation. The preliminary grade correction runway profile and grade correction limits for Alternative 2 are depicted on **Exhibit 9**, Appendix B.

The proposed limits of disturbance for Alternative 2 are depicted on **Exhibits 10 and 11**, Appendix B. The proposed limits of disturbance account for the proposed runway and taxiway extension and safety areas, anticipated erosion



control measures, borrow site locations, runway grade correction, obstruction removal, haul routes, and staging areas. There are wetland impacts as a result of the grading. These impacts are detailed in Section IV G.

5. Phasing

There will be significant impact to runway operations during construction. In order to maintain Runway Design Code (RDC) C-II standards, the Runway 15 threshold will have to be displaced 1,000 feet resulting in a usable runway length of 4,500 feet. A threshold displacement for the construction of the Runway 33 blast pad may also be required. Using declared distances and proper marking, an additional 500 feet for Runway 15 departures could be achieved.

Relocation of the vertical curve non-standard condition for Runway 33 produced with the Runway 15 extension is recommended to be deferred until the next rehabilitative cycle for the runway pavement however, if the work is completed as part of the runway extension project, it will need to be phased after the runway extension is completed and operational. To remain open to the majority of aircraft based at the airport, the runway would likely be reduced to a RDC B-II with a usable runway length of approximately 3,500 feet. The Runway 33 blast pad construction could be completed at this time.

Phasing will need to be coordinated in the future design within the Construction Safety and Phasing Plan (CSPP) review. The temporary use of declared distances will have to be evaluated and approved by FAA. The 1000' runway safety area (RSA) beyond the threshold will have to be maintained to keep men and equipment outside the RSA and to reduce impacts from jet blast if the RDC of C-II is to be maintained.

6. NAVAIDs and Electrical

During the extension construction, the ILS approach to Runway 33 will be out of service due to the relocation of the localizer antenna. During the runway grade correction construction, the glide slope and MALSR will be out of service. The relocation of Glide Slope Equipment to the west side is covered under Common Development Projects.

Electrical items included are:

- High Intensity Runway Lights (HIRL's) for the extension
- Medium Intensity Taxiway Lights (MITL's) for the extension
- Runway End Identify Lights (REILs) will be installed on the Runway 15 end.
- The runway edge lights along both sides of Runway 15-33 will be adjusted in the area of the grade correction. The taxiway lights along Taxiway "E" will also have to be adjusted due to corrective paving.



- New airfield signs (runway distance remaining and runway hold sign)
- The PAPI for Runway 15 will be relocated
- The Runway 33 PAPI will be relocated/adjusted due to the grade correction.
- The existing supplemental Wind Cones for Runways 15 and 33 will be relocated outside the runway object free area.
- Runway 15 Medium Intensity Approach Lighting System with RAILs (MALSR). Cogbill Road does not present a penetration to the 50:1 light plane for the proposed MALSR location.

7. Utilities

(1) Relocate Power Lines (Underground)

The power lines along Cogbill Road are currently not a penetration of the Part 77 Surface. They will become a Part 77 approach obstruction with extension of Runway 15. It is proposed to relocate the utility lines underground along Cogbill Road. Approximately nine poles and 1,500 linear of power line will be impacted.

(2) Natural Gas Pipeline Valve Station

A natural gas pipeline valve station exists within the proposed RPZ. It is currently outside of the existing RPZ. The stations pipes and vents extend approximately three feet above ground. Should an aircraft hit the valve station, the vents could be damaged or destroyed and cause a large explosion. It is proposed to relocate the valve station outside the proposed RPZ. This work has been coordinated with the owner of the pipeline, Columbia Gas.

8. Advantages

Advantages to Alternative 2 include:

- Natural growth obstructions removed to enhance operational safety
- Control over RPZ's achieved
- Runway length increased to 6,300 feet
- Reduced visibility approach (<3/4 mile) on Runway 15 with obstruction removal and installation of MALSR.

9. Disadvantages

Disadvantages to Alternative 2 include:

- Requires power lines along Cogbill Road to be relocated underground
- Runway 15 RPZ extends over church requiring acquisition and relocation



- RPZ control needs also require the acquisition and relocation of two private residences
- Wetland impacts due to obstruction removal and grading
- Requires relocation of PAPI and Localizer
- Requires relocation of Natural Gas Pipeline Valve Station
- Requires pavement grade correction for runway 33 end

C. Development Alternative 3 – Extend Runway and Parallel Taxiway 600’ to the North and 200’ to the South and Common Development Projects

Alternative 3 consists of constructing a 600 foot extension of Runway 15-33 off the end of Runway 15 and a 200 foot extension off of Runway 33 as shown on **Exhibit 12**, Appendix B. The project would also include an extension of the parallel taxiway, construction of a hold apron, blast pad construction, relocation of the Localizer equipment, relocation of the Glide Slope equipment, PAPI relocations, natural gas pipeline valve station relocation, safety area grading, obstruction removal, the relocation of Whitepine Road, Runway 33 MALSR relocation, and land acquisition. Based on Part 77 surfaces, vehicles on State Route 288 would become penetrations to the approach surface. In order to mitigate the penetration, the runway threshold may have to be displaced and declared distances utilized, the precision instrument approach eliminated, or modification of standard granted by the FAA. This alternative also includes all the Common Development Projects discussed in Section D.

Of the 3 mitigation options presented, the displaced threshold option is the most viable. A displacement of the Runway 33 threshold by 200 feet would result in a landing distance of 6,100 feet for Runway 33. The Runway 33 take-off, Runway 15 landing and Runway 15 take-off distances would all remain at 6,300 feet.





EXISTING RUNWAY 33 END

1. Land Acquisition

Runway 15

The County does not control all property within the proposed Runway 15 RPZ. There are 10 property owners affected by the Runway 15 land acquisition. Approximately 37 acres of fee simple is required to control the Runway 15 RPZ. There are two private residences and a church that are affected by the fee simple acquisition. There are approximately 23 acres of aviation easement acquisition required for obstruction removal

Runway 33

The use of a displaced threshold and declared distances will not change the Runway 33 RPZ and no land acquisition is required on the Runway 33 end as a result of Runway Development Alternative 3.

2. Obstruction Removal

There are obstructions to the existing and proposed Part 77 surfaces that would have to be removed from both on airport property and off. There are existing off airport obstructions to the Transitional Surface that will continue to be mitigated by obstruction lights. Several of the obstruction removal areas are proposed to impact wetlands. The extension of the runway to the south will cause the vehicles on the interchange overpass to be obstructions to the Part 77 surface, include the 50:1 approach. Using the criteria in Table 3-2 of AC-13A for Runway Type 7 and 8, it appears that the threshold siting surface



and glideslope qualification surface (GQS) remain clear for a 200 foot extension to the south.

Of the approximately 22 acres of proposed obstruction removal for the runway extension, approximately 5 acres of wetlands are proposed to be affected. All 5 acres of wetlands are proposed to be cleared flush with the ground with no impact to the stumps or root mat.

3. Grading

There was no detailed survey for the 200 foot extension of the south. The extension of the runway and taxiway will require significant embankment material. Based on recent previous construction projects, the existing on-site borrow material is not adequate for embankment beneath pavement. Embankment material from off airport property will be required for the project.

While determining the actual wetland impacts for Alternative 3 was not included in the scope of work, a cursory review of the site indicates that due to the extension of Runway 15-33 to the south and the relocation of Whitepine Road, additional wetlands would be impacted. Approximately four additional acres of wetlands would likely be impacted than impacted in Alternative 2. The parallel taxiway extension would also impact the Resource Protection Area (RPA) for the Chesapeake Bay.

Within 200 feet off the south end of Runway 33 there are existing storm drains that runs through the safety area. The runway and parallel taxiway extension will require relocation of existing drainage structures and new pipe installation.

An additional two acres of wetlands, including the RPA, are proposed to be impacted in order to construct a stormwater management facility. All wetlands in Alternative 3 not associated with obstruction removal are proposed to be cleared, grubbed, and graded to drain.

4. Runway Grade Correction

The extension of the runway will result the last quarter of the runway on the Runway 33 end to extend to the north. However, there is an existing vertical curve within the last quarter of the Runway 33 end which is not allowed under current design standards in AC 105/5300-13A. In order to relocate the vertical curve outside the last quarter, approximately 2,300 feet of the runway pavement and shoulders will require a grade correction including a pavement overlay. Similar to Alternative 2, the grade correction will require several hundred linear feet of milling of one to two inches and overlay thickness up to approximately 13 inches. Due in part to the thick overlay during the last rehabilitation project, the milling depth is minor enough such that reconstruction should not be possible to meet the required pavement



thickness and strength. Connector Taxiway E will also have to be overlaid to meet grading standards. In areas where there is a thick overlay, the existing safety area will need to be regarded to meet standard. Since the existing safety areas already are graded to the maximum extent possible, the safety areas will have to be graded the entire width in those areas.

Since the runway recently underwent a rehabilitative overlay, it is recommended that the grade correction be completed at the next scheduled runway rehabilitation.

5. Phasing

There will be significant impact to runway operations during construction. In order to maintain RDC C-II standards, the Runway 15 threshold will have to be displaced 1,000 feet resulting in a usable runway length of 4,500 feet. A displacement for the construction of the Runway 33 blast pad may also be required. Using declared distances and proper marking, an additional 500 feet for Runway 15 departures could be achieved.

If the work to correct the vertical curve is completed as part of the runway extension project, it will need to be completed after the runway extension is completed and operational. In order to remain open to the majority of aircraft based at the airport, the runway would most likely be reduced to a RDC B-II with a usable runway length of approximately 3,500 feet. The Runway 33 blast pad construction could be completed at this time.

The relocation of Whitepine Road will impact automobile traffic during the tie-ins of the new road to the existing road. This work will most likely be accomplished during off peak hours and at night.

Phasing will need to be coordinated in the future design within the Construction Safety and Phasing Plan (CSPP) review. The temporary use of declared distances will have to be evaluated and approved by FAA. The 1000' runway safety area (RSA) beyond the threshold will have to be maintained to keep men and equipment outside the RSA and to reduce impacts from jet blast if the RDC of C-II is to be maintained.

6. NAVAIDs and Electrical

During the construction of the extension to the north, the ILS approach to Runway 33 will be out of service due to the relocation of the localizer antenna. During the construction of the extension to the south, the ILS approach to Runway 33 will be out of service due to the relocation of the glide slope antenna. During the vertical curve reconstruction, the glide slope and MALSR will be out of service.



Electrical items that are included area:

- High Intensity Runway Lights (HIRL's) for the extensions
- Medium Intensity Taxiway Lights (MITL's) for the extensions
- Runway End Identify Lights (REILs) will be installed on the Runway 15 end.
- The runway edge lights along both sides of Runway 15-33 will have to be adjusted in the area of the asphalt overlay to remove the vertical curve from the last quarter of the runway. The taxiway lights along Taxiway "E" will also have to be adjusted due to corrective paving.
- New airfield signs
- The PAPI for Runways 15 will have to be relocated
- The PAPI for Runways 33 will have to be relocated (if declared distances are not established)
- The existing supplemental Wind Cones for Runways 15 and 33 will have to be relocated outside the runway object free area.
- Runway 15 Medium Intensity Approach Lighting System with RAILS (MALSR)
- Relocation of the Runway 33 MALSR (if declared distances are not established)
- Relocation of the Runway 33 Glide Slope Equipment (if declared distances are not established)
- Relocation of the Runway 33 Localizer Equipment

7. Utilities

(1) Relocate Power Lines (Underground)

The power lines along Cogbill Road are currently not a penetration of the Part 77 Surface. They will become a Part 77 approach obstruction with extension of Runway 15. It is proposed to relocate the utility lines underground along Cogbill Road. Approximately nine poles and 1,500 linear of power line will be impacted.

(2) Natural Gas Pipeline Valve Station

A natural gas pipeline valve station exists within the proposed RPZ. It is currently outside of the existing RPZ. The stations pipes and vents extend approximately three feet above ground. Should an aircraft hit the valve station, the vents could be damaged or destroyed and cause a large explosion. It is proposed to relocate the valve station outside the proposed RPZ. This work has been coordinated with the owner of the pipeline, Columbia Gas.

(3) Sanitary Sewer Line

An existing sanitary sewer line runs across the existing safety area off the south end of Runway 15-33. A 200 foot extension of the runway and



parallel taxiway to the south will require manhole relocations and may require relocation of the sewer line.

8. Advantages

Advantages to Alternative 3 include:

- Natural growth obstructions removed to enhance operational safety
- Control over RPZ's achieved
- Runway length increased to 6,300 feet
- Reduced visibility approach (<3/4 mile) on Runway 15 with obstruction removal and installation of a MALSR.

9. Disadvantages

Disadvantages to Alternative 3 include:

- Requires power lines along Cogbill Road to be relocated underground
- Runway 15 RPZ extends over the Church requiring acquisition and relocation
- RPZ control needs also require the acquisition and relocation of two private residences
- Wetland impacts due to grading and obstruction removal
- Requires relocation of PAPI and Localizer
- Requires relocation of Natural Gas Pipeline Valve Station
- Requires pavement grade correction for Runway 33 end
- Requires relocation of Whitepine Road
- Requires significant drainage reconstruction
- 50:1 Approach surface penetration requires FAA approval
- Requires relocation of PAPI and Localizer
- Requires relocation of sanitary sewer line off the end of Runway 33
- Requires relocation of Runway 33 Glide Slope
- Requires relocation of Runway 33 MALSR

D. Common Development Projects

This section will discuss each of the common development projects that are included in both Alternative 2 and Alternative 3.

1. Land Acquisition – Runway 33 RPZ

The County does not currently control all property within the existing Runway 33 RPZ. Due to an existing roadway interchange within the RPZ, this area will be controlled through the acquisition of land use easement. The remaining property currently not under County control will be purchased in fee simple. There are no existing structures on the property to be purchased for the Runway 33 RPZ. There are two property owners affected by the Runway 33 land acquisition. Approximately 14 acres of fee simple land acquisition



and approximately 16 acres of easement are required. The proposed land acquisition for existing conditions is depicted on **Exhibit 13**, Appendix B.

2. Existing Obstruction Removal

There are obstructions to the existing Runway 15-33 Part 77 surfaces that have to be removed or mitigated regardless of which Runway Development Alternative is chosen. Addressing these obstructions will require land acquisition, obstruction lighting, and obstruction removal.

(1) Install Obstruction Lights

An existing terrain obstruction to the Primary Surface exists on the west side of Runway 15-33 due to a natural gas pipeline. Obstruction lights are proposed to be installed along the length of the pipeline to mitigate the penetration as shown on the ALP. Four proposed obstruction lights are shown on the approved ALP. The obstruction lights are proposed to be at least six feet above the ground to help locate them during maintenance operations. This project has minimal earthwork, no drainage impacts, and no anticipated wetland impacts. The obstruction light locations are depicted on Exhibit 3, Appendix B.



EXISTING FCI OBSTRUCTION LIGHT

(2) Existing Obstruction Removal

There are obstructions to the existing Part 77 surfaces to Runway 15-33. Runway 15 has terrain and low vegetation obstructions on Airport property. The proposed obstruction removal and limits of disturbance are depicted on Exhibits 6, Appendix B. Runway 33 has both terrain and tree obstructions on and off Airport property. There are tree obstructions to both the Primary Surface and Approach Surface. Many of the approach surface obstructions are within the right-of-way of State Route 288.



Of the approximately 27 acres of proposed obstruction removal for the Runway 33 approach, approximately 7 acres of wetlands are proposed to be affected. Of those 7 acres, approximately 1.5 acres are within the Resource Protection Area (RPA) of the Chesapeake Bay Preservation Area. All trees and vegetation that are within wetlands will be cleared flush to the ground with no impact to the stumps or root mat.

3. Construct T-Hangar (Large)

This project is located adjacent to an existing T-hangar, Hangar B, and would consist of a new 10-unit T-hangar designed to handle large single engine and twin engine aircraft. The proposed site and associated taxilanes were constructed during a previous project. The site work was environmentally cleared by a FONSI in May of 2002.

The existing grass area will be paved with a pavement section to match the adjacent pavement. Grades for the lead-in aprons to the hangar will not exceed 2.0%, which is the maximum for A-I and B-I aircraft expected to use the t-hangar. The existing adjacent taxilanes will need to be closed during construction requiring taxiing aircraft to use the eastern most taxilane. There are existing utilities to the site that the hangar can be connected to.

The construction of a stormwater management and stormwater quality facility is anticipated. The stormwater facility will include grading, drainage, and wetland impacts. There is no developable space between the existing airfield infrastructure and the wetlands to construct a stormwater facility. It is anticipated that approximately two acres of wetland will be impacted to construct the stormwater facility.

4. Construct Conventional Hangars (3)

These projects are located between the North Terminal Apron and North parking lot. The three hangars would range in size from 6,400 square feet to 12,000 square feet depending on the demand. Site work was completed during a previous project. The site work was environmentally cleared by a FONSI in May of 2002.

The existing grass area where the hangars will be located has been graded such that only the foundation and slab of the hangar will need to be excavated. The apron area immediately in front of each hangar site will need to be closed during construction. There are existing utilities to the site that the hangars can be connected to.

The construction of a stormwater management and stormwater quality facility is anticipated. The stormwater facility will include grading, drainage, and wetland impacts. There is no developable space between the existing airfield



infrastructure and the wetlands to construct a stormwater facility. It is anticipated that approximately two acres of wetland will be impacted to construct the stormwater facility.



SITE OF CONVENTIONAL HANGARS AND T-HANGAR

5. Relocate Runway 33 Glide Slope Equipment to the West Side

The existing Runway 33 Glide Slope equipment is located between the runway and parallel taxiway and inside the runway object free area (ROFA). The ALP shows the Glide Slope equipment being moved to the west side of the runway outside the ROFA as required by FAA guidance (AC 150/5300-13A). Moving the Glide Slope will eliminate the ILS hold position on Taxiway "A". An existing natural gas line will run through the new Glide Slope critical area requiring coordination with Columbia Gas to determine impacts to the transmission line. An existing sanitary sewer line also runs through the critical area that will require adjustment due to grading.

An existing security perimeter fence and taxiway would be located in the new critical area. The fence can be moved approximately 60 feet towards the property line. Moving the fence would require abandoning the taxiway south of the new fence location. The Airport currently has no lease agreements that require access to the taxiway south of the proposed location and if agreeable to closing that portion of the taxiway. The relocation will also move the Glide Slope equipment in close proximity to several structures within the Airport Industrial Park. These structures are identified on **Exhibit 14**, Appendix B. During the initial installation of the Glide Slope equipment, there was difficulty calibrating the signal due to the Route 288 and Route 10 interchange. The proposed location will move the Glide Slope equipment closer to that interchange.



FAAA Order 6750.16D requires that the area in front of the glide slope antenna be graded to allow the equipment will work properly. The existing grades in front of the proposed equipment do not meet the guidelines and would have to be graded. The grading would impact approximately 6.2 acres of wetlands. The wetlands are proposed to be graded to drain.

It is recommended that a study analyzing the Glide Slope be conducted to determine impacts due to the relocation.

(1) Advantages to Relocation

- Aircraft hold position located at runway
- The Glide Slope equipment will be outside the Runway Object Free Area

(2) Disadvantages to Relocation

- Expense to relocate
- Wetland impacts
- Potential for offsite structure interference
- Glide Slope critical area grading impacts fence, taxiway, and adjacent property requiring coordination with FAA Facilities and Equipment to determine acceptable grading design.
- Coordination with Columbia Gas concerning impacts of grading on the natural gas pipeline
- Sanitary sewer line impact



EXISTING RUNWAY 33 GLIDE SLOPE EQUIPMENT



6. Fuel Farm Improvement

As reported in the Airport Master Plan, the existing fuel farm “equipment is outdated and requires a significant amount of maintenance due to many non-standard, customized parts and solutions to maintain function and meet current SWPPP, SPCC, and DEQ requirements.” The fuel farm improvement will replace the existing underground storage tanks (UST) with above ground storage tanks (AST) in a site adjacent to the existing facility. The facility would also include a delivery truck and tender loading position that meets current VDEQ requirements. The grading limits of the fuel farm, which include a stormwater management basin, are proposed to impact approximately 0.3 acres of wetlands.

The location of the fuel farm was chosen for many reasons. One reason was to reuse as much of the existing facility as possible and therefore reduce the footprint of disturbed ground. Another is that the existing utilities that are required for the facility are already on site. The site provides a safer environment by separating the fuel delivery trucks and aircraft. The site is also within close proximity to the State Police Aviation Unit, which is staffed around the clock and is able to monitor the facility for security reasons.



EXISTING FCI FUEL FARM

7. Replace Rotating Beacon

The existing rotating beacon is over 30 years old and is in need of replacement as it is difficult to locate bulbs and support routine maintenance. The existing beacon tower and infrastructure do not need replaced. This project has no earthwork, drainage impacts, or wetland impacts.





EXISTING FCI ROTATING BEACON

IV. DESIGN ELEMENTS OF PREFERRED ALTERNATIVE

There are several design elements associated with the preferred alternative that are described below. The projects in the preferred alternative include:

- Extend Runway and parallel taxiway 800 feet to the north
- Obstruction Removal
- Construct T-Hangar (Large)
- Construct Conventional Hangars (3)
- Relocate Glide Slope Equipment
- Fuel Farm Improvement
- Replace Rotating Beacon

This section will discuss each of the design elements in detail.

A. GEOMETRIC DESIGN STANDARDS AND PAVEMENT LIMITS

1. Runway Extension

The preliminary geometric layout for the runway and taxiway extension was developed in accordance with FAA AC 150/5300-13A, *Airport Design* (AC-13A) for a RDC C-II-2400 and Taxiway Design Group (TDG) 2. The



pavement limits are depicted in Exhibit 3, Appendix B. The proposed extension is 800 feet long and 100 feet wide.

2. Parallel Taxiway

The preliminary design of the parallel taxiway was prepared in accordance with Table 4-1 (AC-13A) for an Airplane Design Group (ADG) II and Tables 4-2 and 4-4 (AC-13A) for TDG 2. The runway to parallel taxiway separation will be 400 feet in accordance with Table 7-7A (AC-13A) for a runway with visibility minimums lower than 3/4 mile. The current separation is 375 feet. A new hold apron designed to accommodate multiple ADG II aircraft parked on the apron while allowing ADG II aircraft to taxi by. The existing Runway 15 hold apron will be removed. The parallel taxiway and connector taxiway will be 35 feet wide with fillets designed in accordance with Table 4-4 of AC-13A.

3. Blast Pads

The preliminary design of the blast pads was prepared in accordance with the runway design standards matrix Table A7-7 in AC-13A for a runway with visibility minimums lower than 3/4 mile. The blast pads are 150 feet long and 120 feet wide.

4. T-Hangar

The paving limits of the t-hangar would be the existing taxilanes and t-hangar building that surrounds the site.

5. Fuel Farm Improvements

The geometric layout for the fuel farm will be designed to allow for both fuel delivery trucks and fuel tenders to maneuver safely around the facility location. A second entrance/exit road off of Airfield Drive will be designed for maneuverability. The site will be kept within the existing limits of the fuel farm in order to minimize the limits of disturbance.

B. GRADING DESIGN STANDARDS

1. Runway & Taxiway Extension

The preliminary grading design for the runway and taxiway was developed in accordance with FAA AC 150/5300-13A, *Airport Design* for a RDC C-II-2400, ADG II, and TDG II. Preliminary grading was accomplished to determine an approximate area for the overall limits of disturbance as shown in Exhibit 11, Appendix B. Due to the size and volume of earthwork required, heavy construction equipment use is anticipated, such as bulldozers, roller compactors, track excavators, scrapers (pans), graders, etc.

The existing longitudinal grade of the runway was extended the length of the proposed extension to ensure that there are no vertical curves in the last quarter of the runway. The transverse slopes were designed to minimize earthwork while providing good drainage away from the pavement. The



safety area beyond the end of the runway was graded to tie back to existing ground as soon as possible to reduce grading while providing good drainage. Additional grading around the safety area was incorporated to maintain proper drainage and include anticipated location and sizes of temporary erosion and sediment control measures, i.e., sediment traps and sediment basins.

The preliminary grading design identified the majority of grading work associated with the runway extension project to be embankment. It is anticipated that the earthwork material needed for the project would be found off airport property.

The taxiway was designed to remain below the runway centerline elevation. The area was graded to provide positive drainage and meet the grading requirements of the taxiway pavement, safety areas, object free areas,

2. Runway Grade Correction

Exhibit 9, Appendix B depicts the preliminary profile for proposed runway extension. The proposed runway grade continues the existing runway grade from the existing threshold to the proposed threshold without a change in grade. The safety area beyond the end of the runway is a straight grade from the runway end to the end of the safety area.

The extension of the runway to the north increases the length of the last quarter of the runway causing the last quarter point to move to the north. This move causes a longitudinal vertical curve to be introduced into the last quarter of the runway which would not meet current standards in AC 150/5300-13A. In order to remove all vertical curves from the last quarter of the new runway length, the rehabilitation of approximately 2,500 feet of the existing runway between the end of Runway 33 and Taxiway "C" would be required. The rehabilitation will require overlays of up to 12 inches and milling in areas of one to two inches to correct the grade. The thick overlays will require significant grading within the runway safety areas in order to meet the safety area grading criteria. The proposed vertical curve correction limits are shown in Exhibit 10, Appendix B.

3. Obstruction Removal

The project site contains several acres of trees and wooded areas for obstruction removal. There are approximately 49 acres of clearing and grubbing that are required as a part of preferred alternative. Of the 49 acres, approximately 17 acres are wetlands. It is proposed that all 17 acres be cleared flush with the ground with no impact to the stumps or root mat.

4. Glide Slope Relocation to the West Side

The preliminary grading for the west side glide slope relocation was based on the guidelines in Order 6750.16D Figure 3-7. Using the referenced



guidelines, the grading limits impact adjacent property. Experience has indicated that while the criteria allow a 3.0% max slope, the slopes needed are usually closer to 1.0%. A flatter slope was designed that did not impact adjacent property, however the amount of fill increased and the fence and industrial park taxiway were impacted.

A preliminary design study including DOAV and FAA Facilities and Equipment coordination will be required to determine what grades are acceptable for the glide slope critical area and the extent of the grading impacts. As noted earlier, the grading limits and depth of fill may impact the existing utilities within the grading area.

5. Fuel Farm Improvement

The fuel farm improvements will utilize as much of the existing paved area as possible. The new entrance/exit road off of Airfield Drive will require minimal grading due to the flat grades in the area. A culvert will be required under the road due to an existing roadside ditch. Proposed guidelines will require the construction of a stormwater facility which will result in the majority of the grading and drainage for this project. Wetlands are proposed to be impacted due to grading for the stormwater facility. Since no guidelines are available for the facility, the extent of the facility and wetland impacts can only be estimated at this time. As part of the site work for the fuel farm, approximately two acres of trees are proposed to be removed.

6. Construct T-Hangar (Large)

Minor grading to excavate the foundation, slab, and adjacent pavement is anticipated. Proposed guidelines will require the construction of a stormwater facility which will result in the majority of the grading and drainage for this project. Wetlands are proposed to be impacted due to grading for the stormwater facility. Since no guidelines are available for the facility, the extent of the facility and wetland impacts can only be estimated at this time. As part of the site work for the stormwater facility, approximately two acres of trees are proposed to be removed.

7. Construct Conventional Hangars (3)

Minor grading to excavate the foundation and slab is anticipated. Proposed guidelines will require the construction of a stormwater facility which will result in the majority of the grading and drainage for this project. Wetlands are proposed to be impacted due to grading for the stormwater facility. Since no guidelines are available for the facility, the extent of the facility and wetland impacts can only be estimated at this time. As part of the site work for the stormwater facility, approximately two acres of trees are proposed to be removed.

C. AIRSPACE REQUIREMENTS

The runway extension and installation of MALSR will reduce the minimums and



enlarge the approach surfaces for Runway 15. Existing trees will be removed to clear the approach and transitional surfaces of penetrations.

A survey was completed that included spot elevations of the centerline of Cogbill Road for approximately 1,500 feet from the intersection with Belmont Road to the south beneath the approach to Runway 15. The spot elevations were compared to the proposed approach surfaces to Runway 15. It was determined that Cogbill Road with vehicle traffic is not a penetration to any surfaces in Table 3-2 of AC-13A or FAR Part 77.

There are existing tree obstructions to the Runway 33 approach and transitional surfaces that will have to be removed. A natural gas pipeline runs parallel to the runway outside the runway safety area. The terrain over the pipeline is an obstruction to the primary surface and will be mitigated with obstruction lights. The runway grade correction between Taxiway “C” and the Runway 33 end will not eliminate the pipeline easement terrain obstruction.

The t-hangar, conventional hangars, fuel farm, and rotating beacon do not impact the airspace. The relocated Glide Slope equipment and obstruction lights will be penetrations to the Part 77 surfaces and will be marked appropriately.

D. ESTIMATED ELECTRICAL LOADS

The runway and parallel taxiway extension will have little impact on the existing electrical vault. The existing systems and constant current regulators (CCR), with the exception of the taxiway circuit CCR, meet the needs of the airport. The taxiway circuit CCR should be replaced due to age. The proposed Runway 15 MALSR would not be tied to the runway circuit or electrical vault. It will most likely be powered from a separate transformer near Cogbill Road.

The t-hangar, conventional hangars, fuel farm, relocated Glide Slope equipment, obstruction lights, and rotating beacon are not connected to airfield circuits and will not impact the electrical loads in the vault.

E. TRAFFIC MIX FOR PAVEMENT DESIGNS

For the purposes of preliminary pavement design, a fleet mix containing a variety of general aviation aircraft was developed to be used in the FAARFIELD - Airport Pavement Design program for the runway and parallel taxiway extension. The aircraft operations and aircraft type shown below are derived from the most recent Airport Master Plan for the forecasted year 2027:

Table 1 – Aircraft Operations

| Aircraft Type | Gross Weight (lbs) | 2027 Annual Departures |
|----------------------|---------------------------|-------------------------------|
| Sngl Whl -3 | 3,000 | 71,429 |
| Sngl Whl – 5 | 5,000 | 9,595 |
| Dual Whl-20 | 20,000 | 7,463 |
| Dual Whl- 75 | 75,000 | 13,859 |





GULFSTREAM G200

F. POTENTIAL UTILITY CONFLICTS

1. Runway Extension

The runway extension will require the power lines along Cogbill Road to be relocated underground. Approximately nine poles and 1,500 linear of power line will be impacted. The work will be completed per the requirements of Dominion Power.

A natural gas pipeline valve station in the proposed Runway 15 RPZ will be relocated outside the RPZ. The owner of the station, Columbia Gas, has indicated that they would relocate the entire station north along the pipeline easement to a location outside the proposed RPZ.



GAS PIPELINE VALVE STATION IN PROPOSED RUNWAY 15 RPZ



2. Glide Slope Relocation to the west side

The relocation of the glide slope equipment to the west side will have the potential to impact both the natural gas pipeline and an existing sanitary sewer system. The impact to the natural gas pipeline will depend on the critical area grading plan that is accepted by the FAA Facilities and Equipment section. Glide Slope critical area grading requires flat slopes. The proposed critical area is in a location that will require fill. That will require additional assessment by Columbia gas to determine if it is acceptable overburden over the natural gas pipeline.

An existing sanitary sewer line currently runs through the proposed Glide Slope critical area. Depending on final grades, the sanitary sewer structures and line may have to be relocated or adjusted.

Additional design and coordination with the FAA Facilities and Equipment section should be the next step to determine the ultimate impacts of the Glide Slope relocation to the west side.

3. Other Development Projects

There are no anticipated utility impacts from the remaining preferred alternative projects.

G. POTENTIAL ENVIRONMENTAL AND HISTORICAL IMPACTS

Wetlands are a critical environmental aspect to consider during construction projects. The County is required to delineate wetlands within the project area and, if necessary, mitigate impacts on any adversely affected wetlands. Wetlands are defined in Executive Order 11990 as: "Those areas that are inundated by surface or ground water with a frequency sufficient to support and under normal circumstances does or would support a prevalence of vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands generally include swamps, marshes, bogs, and similar areas such as sloughs, potholes, wet meadows, river overflows, mud flats and natural ponds." Areas covered with water for such a short time that there is no effect on moist soil vegetation are not included within the definition of wetlands, nor are the permanent waters of streams, reservoirs, and deep lakes.

A wetland survey and delineation was completed by Mill Creek Environmental and has indicated that wetlands are present within the project area. There are several areas of wetlands both on and off airport property. The areas of greatest impact are areas associated with the relocation of the Glide Slope equipment to the west side of the runway and the obstruction removal areas. The overall wetland impacts are shown and described in more detail in Chapter Four of the Environmental Assessment.

Table 2 and **Exhibits 15 and 16**, Appendix B, identify the impacted areas for each of the development projects for the preferred alternative.



Table 2 – Wetland Impacts: Development Alternative 2

| Construction Component | Wetland Impacts - Fill (AC) | Wetland Impacts – Conversion/Cutting (AC) |
|---|------------------------------------|--|
| Runway Extension – Construction | 0.8 | 0 |
| Runway Extension – Obstruction Removal | 0 | 5.0 |
| Obstruction Removal – Runway 33 | 0.0 | 6.9 |
| T-Hangar | 2.0 | 0 |
| Conventional Hangars | 2.0 | 0 |
| Relocate Glide Slope Equipment to the west side | 6.2 | 0 |
| Fuel Farm Improvements | 0.3 | 0 |
| Replace Rotating Beacon | 0 | 0 |
| Total | 11.3 | 11.9 |

There is no intent to fill, redirect, or alter any jurisdictional ditches or streams with the preferred alternative.

There are no anticipated historical impacts with the preferred alternative.

During a meeting with the Chesterfield County Environmental Engineering Department on December 11, 2013, the Department noted that new guidelines for the Chesapeake Bay Act would be released in draft form in early 2014 and would go into effect on July 1, 2014. The Department indicated that there would be stormwater management and stormwater quality guidelines not previously required. In order to accommodate the new guidelines, additional wetlands associated with the Fuel Farm, T-Hangar, and Conventional Hangar projects are proposed to be impacted by stormwater management and stormwater quality measures.

H. PERMITS, CHECKLISTS, AND OTHER LOCAL REGULATIONS

The following tables illustrate a list of permits, letters, and concurrences that may be acquired. Agency descriptions; Virginia Department of Environmental Quality (DEQ), Army Corps of Engineers (ACOE), Federal Aviation Administration (FAA), Virginia Department of Historic Resources (DHR), Chesterfield County.



Table 3 – Permits, Approvals, Concurrence to be Obtained During EA

| Permits/Approval/Concurrence to be Obtained During Environmental Assessment | | | |
|---|------------------------------|---|--|
| Item | Permit/Approval/Concurrence | Responsible Agencies | Remarks/Comments |
| Areas of Potential Effect | Concurrence | DHR, FAA | Based upon area encompassed by alternatives presented in 2011 MP Update |
| Phase I Cultural Resources Survey | Concurrence | DHR | |
| Coastal Zone Management Consistency Determination | Concurrence | DEQ | |
| Jurisdictional Determination | Approval | ACOE, DEQ | |
| Perennial Flow and Resource Protection Agency (RPA) Designation | Concurrence | Chesterfield County Department of Environmental Engineering | Confirmation received September 19, 2013 |
| ACOE/DEQ Joint Permit & ACOE Individual Permit – Wetland Impacts | Permit Application Submittal | ACOE, DEQ | Delta and Mill Creek cannot guarantee that the regulatory agencies will issue permits. Only conceptual mitigation is presented in this scope, final wetlands mitigation plans will be under a separate scope of work and will likely need to be completed prior to issuance of permits from resource agencies for impacts to wetlands. |

Source: Delta Airport Consultants, Inc.

Table 4 – Permits, Approvals, Concurrence to be Obtained After EA

| Permits/Approval/Concurrence/ to be Obtained After Environmental Assessment | | | | |
|---|-----------------------------|---|---------------------------|--|
| Item | Permit/Approval/Concurrence | Responsible Agencies | When Issued/Conducted | Remarks/Comments |
| ACOE/DEQ Joint Permit & ACOE Individual Permit – wetland impacts | Permit | ACOE, DEQ | Design | Agencies will not issue permit(s) until limits of disturbance have been completed |
| Environmental Due Diligence Audit | Approval/Concurrence | DEQ | Land Acquisition Services | |
| Stormwater Management Plan | Approval | Chesterfield County | Design | |
| Erosion and Sediment Control Plans | Approval | Soil Conservation District – Review Chesterfield County - enforcement | Construction | Contractor acquires prior to construction, after design and bid phase |
| Grading Permits | Permit | Chesterfield County | Construction | Contractor acquires prior to construction, after design and bid phase |

Source: Delta Airport Consultants, Inc.



I. OFFSITE PROPERTY IMPACTS

Fee Simple land acquisition is required for control of the proposed Runway Protection Zone (RPZ). Easement acquisition is also required for obstruction removal for existing and proposed surfaces.

The proposed land acquisition parcels for preferred alternative are depicted on Exhibits 2 and 7, Appendix B.

J. QUANTITIES & COST ESTIMATES

The approximate cost of the projects includes anticipated construction costs, owner administrative costs, engineering and architectural fees for both design and construction phases, land acquisition, easement acquisition, utility work, and estimated wetland mitigation fees. The estimated quantities and Engineer’s Opinion of Probable Costs for this alternative are included in Appendix C.

Table 4 presents the proposed phasing and funding plan.

Table 4 – Phasing and Funding Plan

| Phase | Description | Estimated Cost | |
|--------|--------------------------------|-------------------|-----------------------|
| | | Est. AIP Eligible | Est. Non-AIP Eligible |
| Year 1 | Wetland Mitigation | \$265,000 | |
| | Existing Obstruction Removal | \$456,000 | \$304,000 |
| | Install Obstruction Lights | \$70,000 | |
| | Year Total: | \$791,000 | \$304,000 |
| Year 2 | Land Acquisition | \$275,000 | |
| | Wetland Mitigation | \$740,000 | \$430,000 |
| | Year Total: | \$1,015,000 | \$430,000 |
| Year 3 | Land Acquisition | \$2,700,000 | |
| | Construct T-Hangar | | \$970,000 |
| | Year Total: | \$2,700,000 | \$970,000 |
| Year 4 | Extend Runway (Design) | \$500,000 | |
| | Utility Relocations | \$2,050,000 | |
| | Year Total: | \$2,550,000 | \$0.00 |
| Year 5 | Extend Runway (Construction) | \$5,000,000 | |
| | Year Total: | \$5,000,000 | \$0,00 |
| Year 6 | Extend Runway (Construction) | \$2,170,000 | |
| | Replace Rotating Beacon | \$75,000 | |
| | Construct Conventional Hangars | | \$5,100,000 |
| | Relocate Glide Slope | \$1,600,000 | |
| | Year Total: | \$3,845,000 | \$5,100,000 |
| Year 7 | Fuel Farm Improvements | | \$2,300,000 |
| | Year Total: | \$0.00 | \$2,300,000 |



V. DESIGN REFERENCES

The following FAA Advisory Circulars were referenced and utilized during this preliminary design effort:

- 150/5300-13A, Airport Design
- 150/5320-5C, Surface Drainage Design
- 150/5320-6E, Airport Pavement Design and Evaluation
- 150/5340-1K, Standards for Airport Markings
- 150/5340-18F, Standards for Airport Sign Systems
- 150/5340-30G, Design and Installation Details for Airport Visual Aids
- 150/5345-44J, Specifications for Taxiway and Runway Signs
- 150/5370-2F, Operational Safety on Airports During Construction
- 150/5370-10F, Standards for Specifying Construction of Airports
- 150/5370-2F, Operational Safety on Airports During Construction



APPENDIX A
ACRONYMS

Acronyms:

ACIP - Airport Capital Improvement Plan

ACOE - Army Corps of Engineers

ALP - Airport Layout Plan

APE - Area of Potential Effect

BMP - Best Management Practices

CIP - Capital Improvement Plan

CZM - Coastal Zone Management

DCR - Virginia Department of Conservation and Recreation

DEQ - Virginia Department of Environmental Quality

DGIF - Virginia Department of Game and Inland Fisheries

DHR - Virginia Department of Historic Resources

DNL - Day Night Average Sound Level

DOAV - Virginia Department of Aviation

DOT - Department of Transportation

EA - Environmental Assessment

EDDA - Environmental Due Diligence Audit

EDMS - Emissions and Dispersion Modeling System

EPA - Environmental Protection Agency

ESA - Endangered Species Act

E&SC - Erosion & Sediment Control

FAA - Federal Aviation Administration

FEMA - Federal Emergency Management Agency

FIRM - Flood Insurance Rate Map

FPPA - Farmland Protection Policy Act

INM - Integrated Noise Model

JD - Jurisdictional Determination

MP - Master Plan

MALSR - Medium-Intensity Approach Lighting System with Runway Alignment Indicator Lights

NEPA - National Environmental Policy Act

NPDES - National Pollutant Discharge Elimination System

PAPI - Precision Approach Path Indicator

PER - Preliminary Engineering Report

RSA - Runway Safety Area

SHPO - State Historic Preservation Office(r)

URARPAPA - Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970

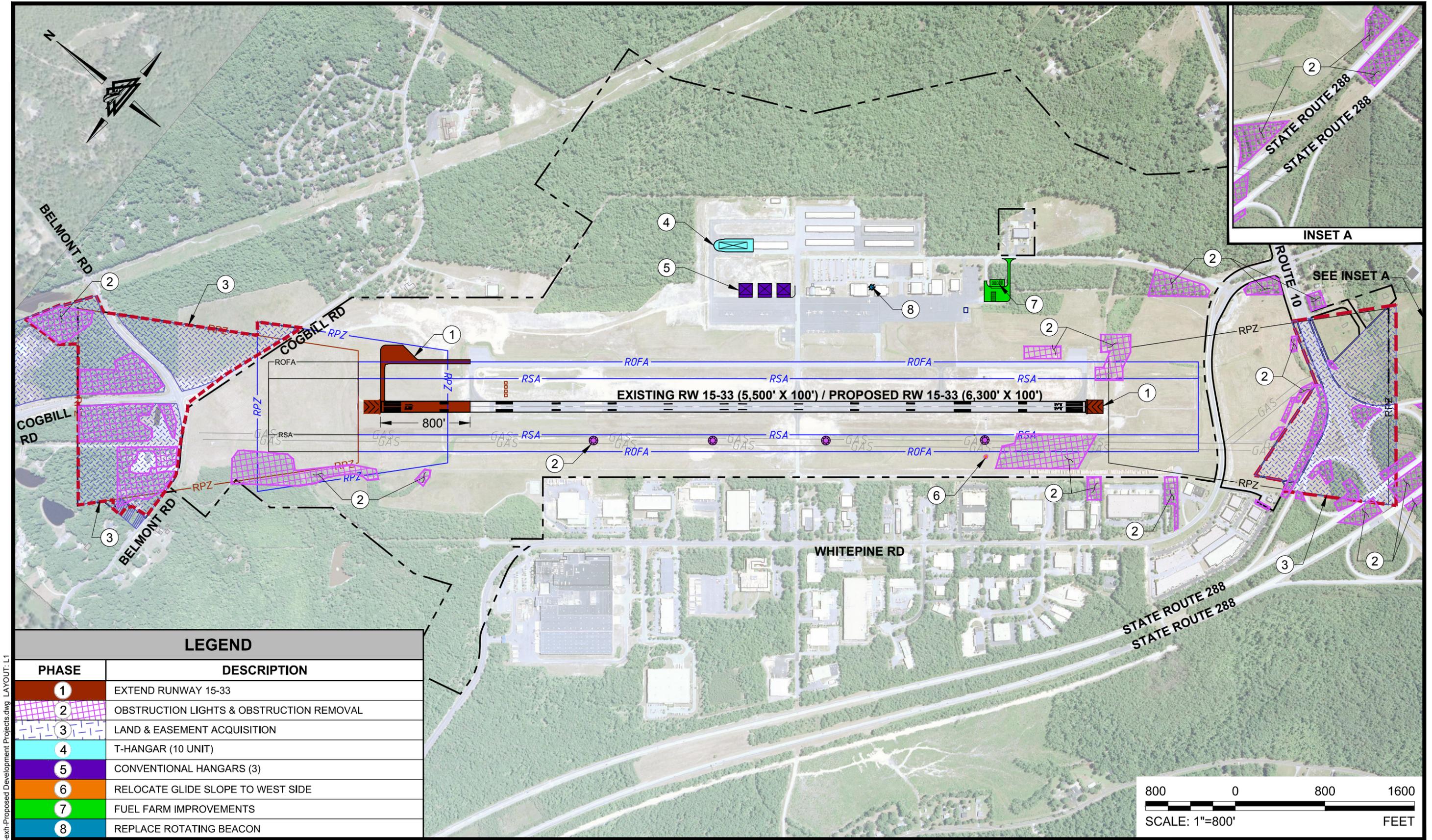
USDA-NCRS - U.S. Department of Agriculture-Natural Resource Conservation Service

USFWS - U.S. Fish and Wildlife Service

APPENDIX B

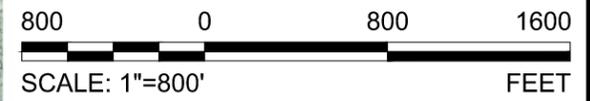
EXHIBITS

- Exhibit 1 – *Proposed Development Projects*
- Exhibit 2 – *Development Alternative 1 (No Action)*
- Exhibit 3 – *Development Alternative 2 (Proposed Action)*
- Exhibit 4 – *Land Acquisition – Runway Development Alternative 2*
- Exhibit 5 - *Obstruction Removal – Alternative 2 – Sheet 1*
- Exhibit 6 - *Obstruction Removal – Alternative 2 – Sheet 2*
- Exhibit 7 – *Completed Survey for Runway Development Alternative 2*
- Exhibit 8 – *Preliminary Runway Extension Centerline Profile – Alternative 2*
- Exhibit 9 – *Preliminary Runway Grade Correction – Alternative 2*
- Exhibit 10 – *Approximate Limits of Disturbance – Alternative 2 – Sheet 1*
- Exhibit 11 – *Approximate Limits of Disturbance – Alternative 2 – Sheet 2*
- Exhibit 12 – *Development Alternative 3*
- Exhibit 13– *Land Acquisition – Runway 33 RPZ*
- Exhibit 14 – *Relocate Glide Slope to the West Side*
- Exhibit 15 – *Approximate Wetland Impacts – Alternative 2 – Sheet 1*
- Exhibit 16 – *Approximate Wetland Impacts – Alternative 2 – Sheet 2*



LEGEND

| PHASE | DESCRIPTION |
|-------|--|
| 1 | EXTEND RUNWAY 15-33 |
| 2 | OBSTRUCTION LIGHTS & OBSTRUCTION REMOVAL |
| 3 | LAND & EASEMENT ACQUISITION |
| 4 | T-HANGAR (10 UNIT) |
| 5 | CONVENTIONAL HANGARS (3) |
| 6 | RELOCATE GLIDE SLOPE TO WEST SIDE |
| 7 | FUEL FARM IMPROVEMENTS |
| 8 | REPLACE ROTATING BEACON |



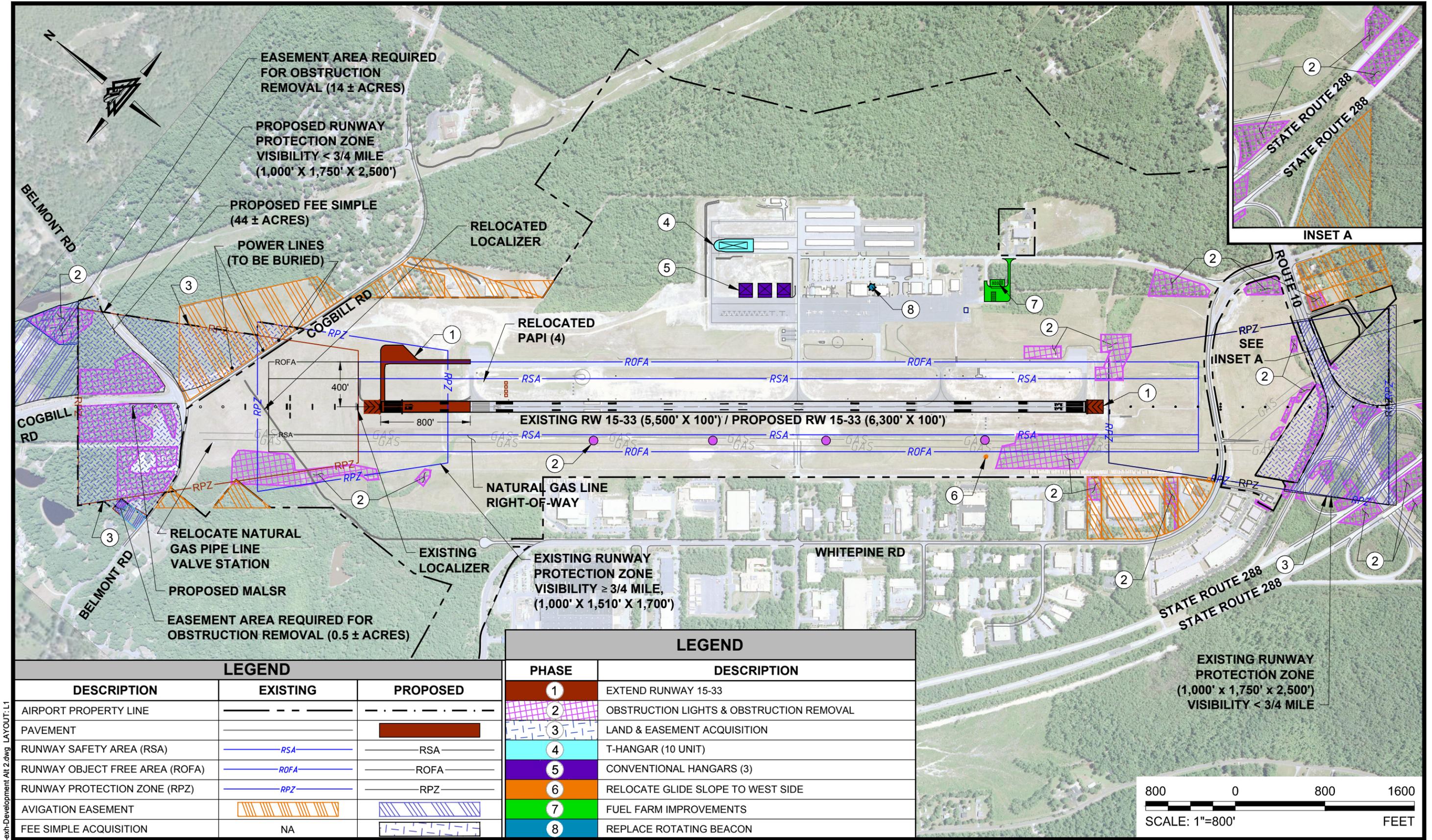
**PROPOSED DEVELOPMENT PROJECTS
CHESTERFIELD COUNTY AIRPORT**

**EXHIBIT
1**

DRAWING: 10086-exh-Proposed Development Projects.dwg LAYOUT: L1

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DRAWN BY: ABC CHECKED BY: DES SCALE: 1"=800' DATE: OCTOBER 2013



| LEGEND | | |
|--------------------------------|----------|-----------|
| DESCRIPTION | EXISTING | PROPOSED |
| AIRPORT PROPERTY LINE | --- | -.-.-.-.- |
| PAVEMENT | --- | █ |
| RUNWAY SAFETY AREA (RSA) | —RSA— | RSA |
| RUNWAY OBJECT FREE AREA (ROFA) | —ROFA— | ROFA |
| RUNWAY PROTECTION ZONE (RPZ) | —RPZ— | RPZ |
| AVIGATION EASEMENT | ▨ | ▨ |
| FEE SIMPLE ACQUISITION | NA | ▨ |

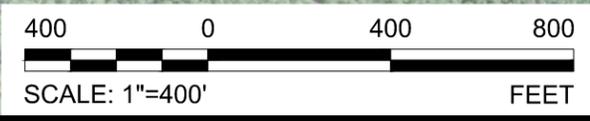
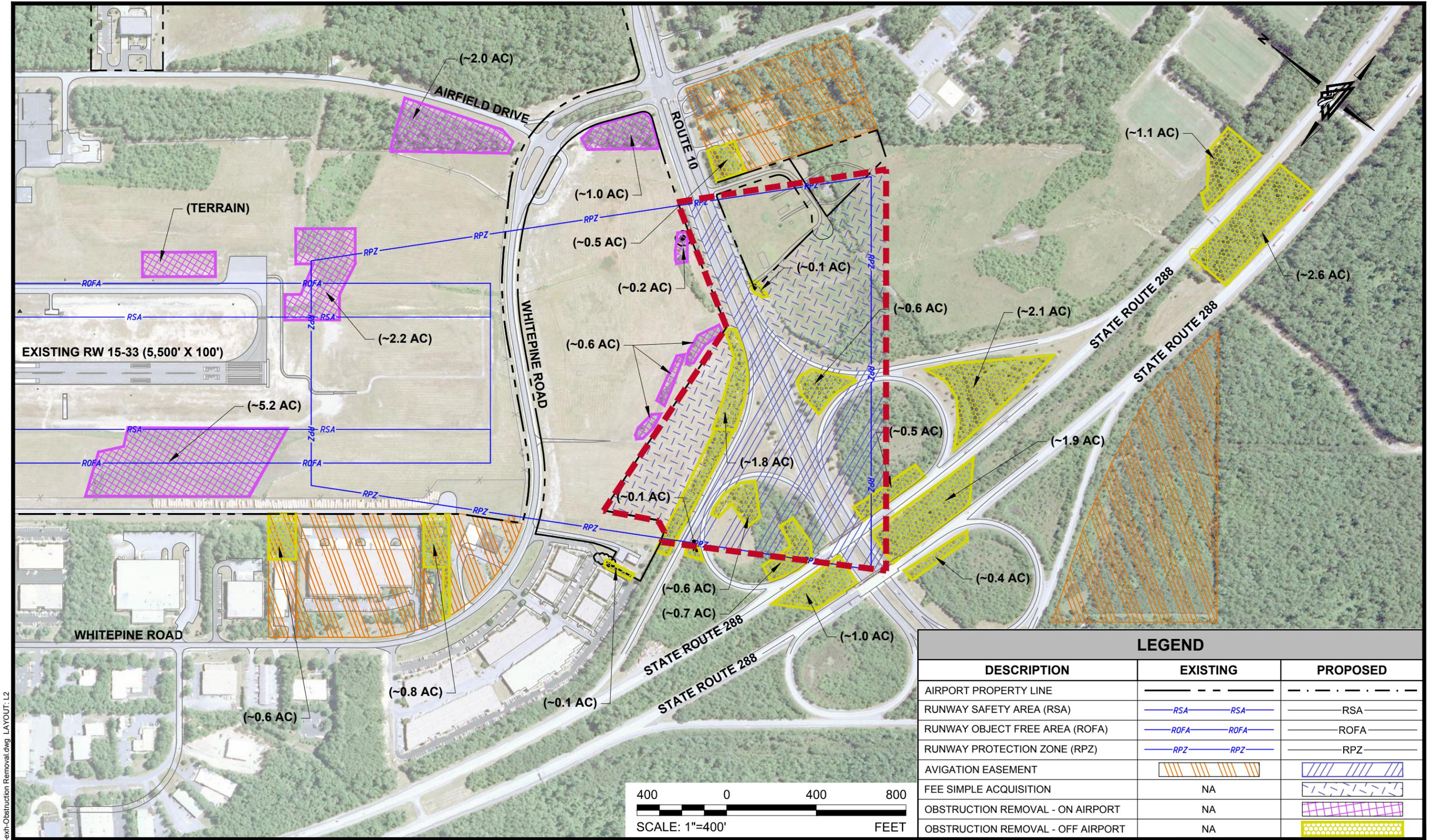
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| PHASE | DESCRIPTION |
| 1 | EXTEND RUNWAY 15-33 |
| 2 | OBSTRUCTION LIGHTS & OBSTRUCTION REMOVAL |
| 3 | LAND & EASEMENT ACQUISITION |
| 4 | T-HANGAR (10 UNIT) |
| 5 | CONVENTIONAL HANGARS (3) |
| 6 | RELOCATE GLIDE SLOPE TO WEST SIDE |
| 7 | FUEL FARM IMPROVEMENTS |
| 8 | REPLACE ROTATING BEACON |

**DEVELOPMENT ALTERNATIVE 2
CHESTERFIELD COUNTY AIRPORT**

DRAWING: 10086-exh-Development Alt 2.dwg LAYOUT: L1

DRAWN BY: ABC CHECKED BY: DES SCALE: 1"=800' DATE: OCTOBER 2013

**EXHIBIT
3**



| LEGEND | | |
|-----------------------------------|-------------|-----------------------------------|
| DESCRIPTION | EXISTING | PROPOSED |
| AIRPORT PROPERTY LINE | --- | - . - . - . - . - . - . - . - . - |
| RUNWAY SAFETY AREA (RSA) | —RSA—RSA— | —RSA— |
| RUNWAY OBJECT FREE AREA (ROFA) | —ROFA—ROFA— | —ROFA— |
| RUNWAY PROTECTION ZONE (RPZ) | —RPZ—RPZ— | —RPZ— |
| AVIGATION EASEMENT | | |
| FEE SIMPLE ACQUISITION | NA | |
| OBSTRUCTION REMOVAL - ON AIRPORT | NA | |
| OBSTRUCTION REMOVAL - OFF AIRPORT | NA | |

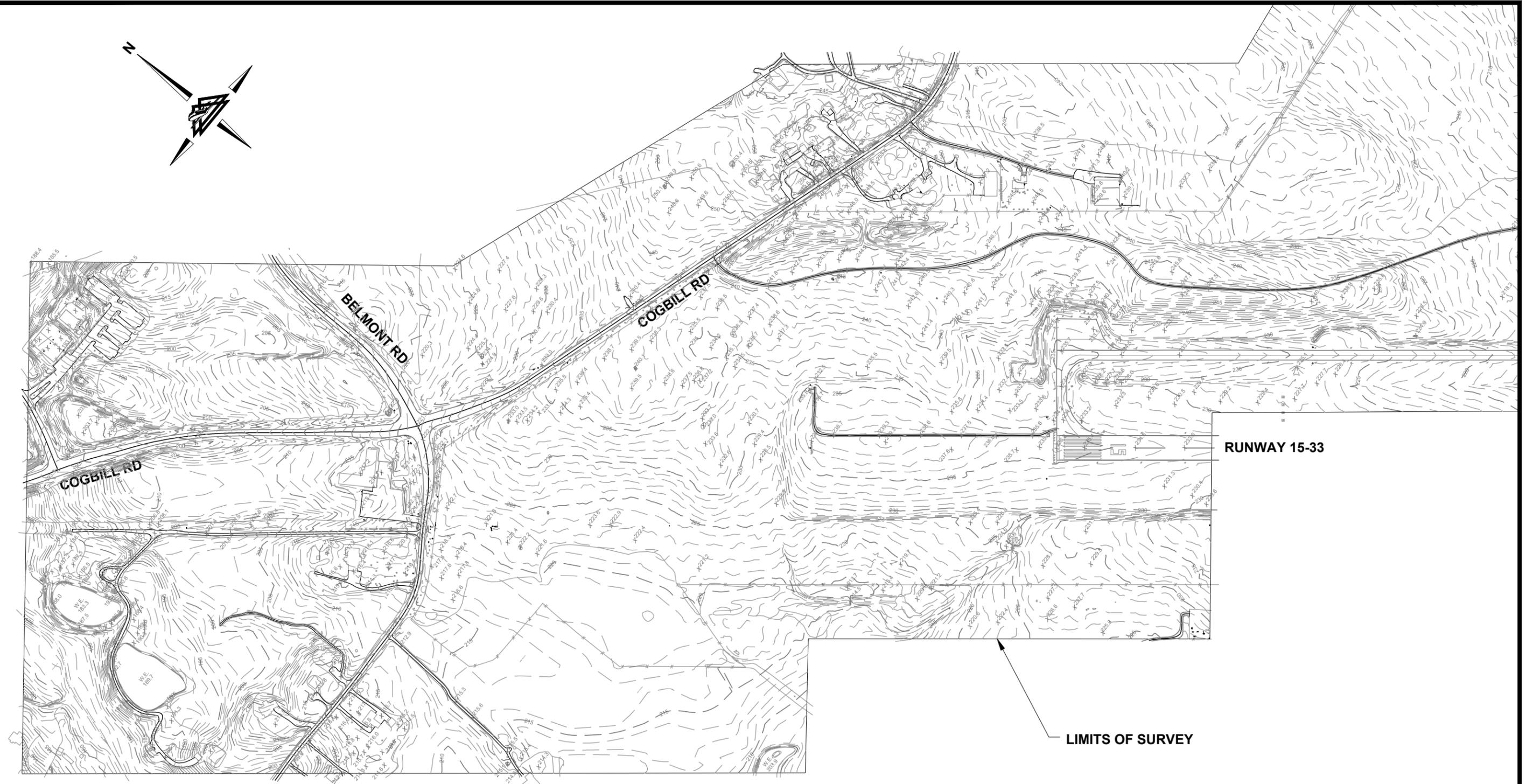
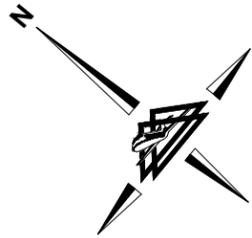
OBSTRUCTION REMOVAL - ALTERNATIVE 2 - SHEET 2
CHESTERFIELD COUNTY AIRPORT

EXHIBIT
6

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**COMPLETED SURVEY FOR RUNWAY DEVELOPMENT - ALTERNATIVE 2
CHESTERFIELD COUNTY AIRPORT**

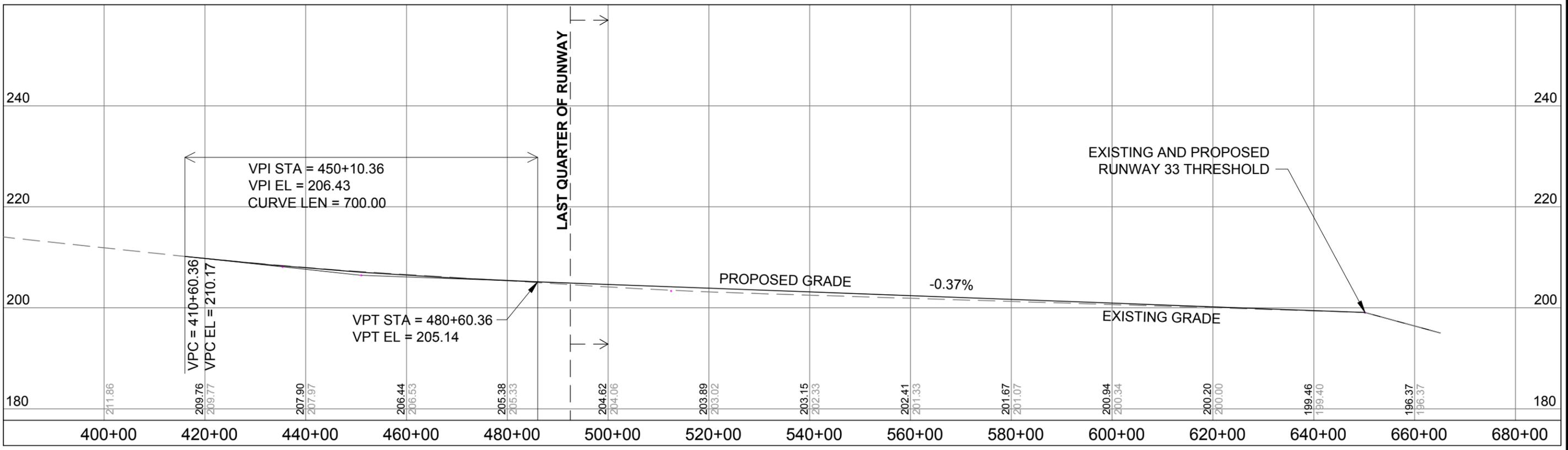
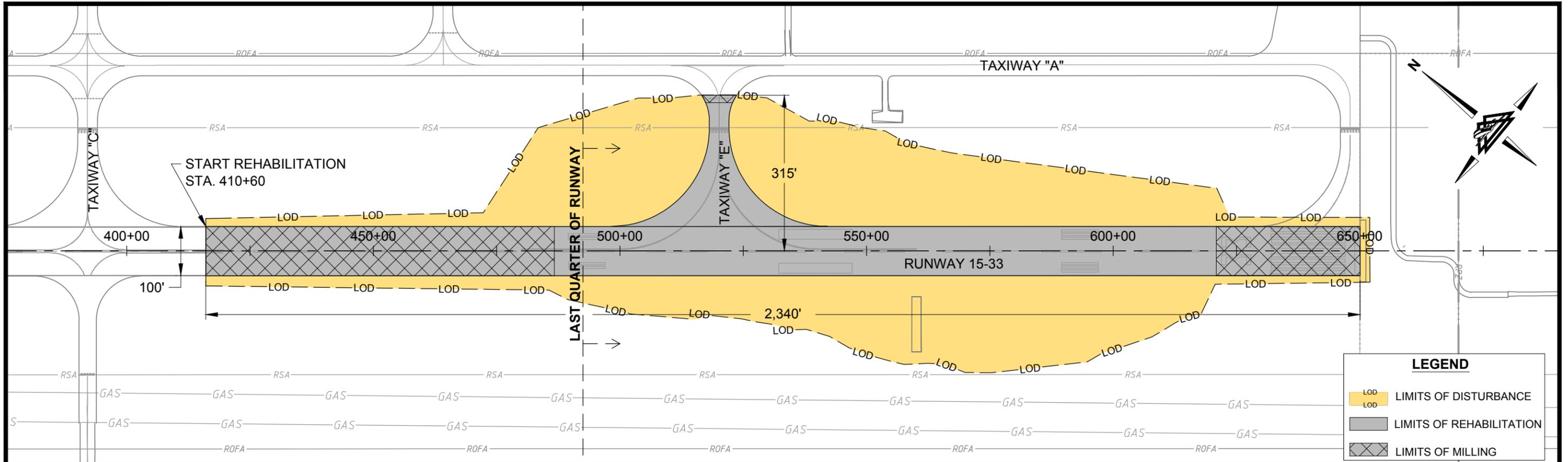
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PRELIMINARY RUNWAY GRADE CORRECTION - ALTERNATIVE 2
CHESTERFIELD COUNTY AIRPORT

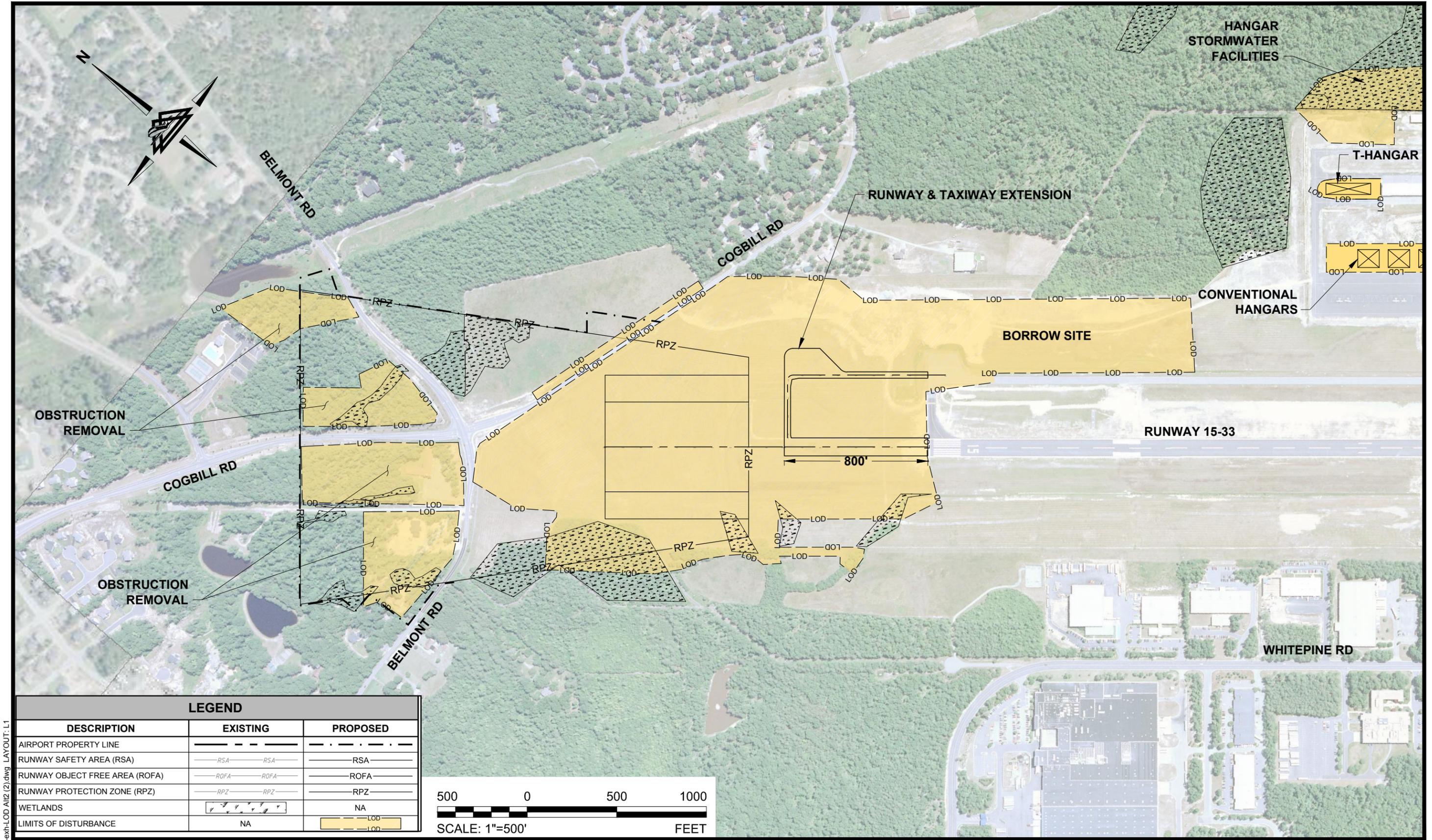
EXHIBIT
9

DRAWING: 10086-exh-Preliminary Grade Correction.dwg LAYOUT: L1



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LEGEND

| DESCRIPTION | EXISTING | PROPOSED |
|--------------------------------|--------------|----------|
| AIRPORT PROPERTY LINE | --- | --- |
| RUNWAY SAFETY AREA (RSA) | —RSA— RSA— | —RSA— |
| RUNWAY OBJECT FREE AREA (ROFA) | —ROFA— ROFA— | —ROFA— |
| RUNWAY PROTECTION ZONE (RPZ) | —RPZ— RPZ— | —RPZ— |
| WETLANDS | | NA |
| LIMITS OF DISTURBANCE | NA | |



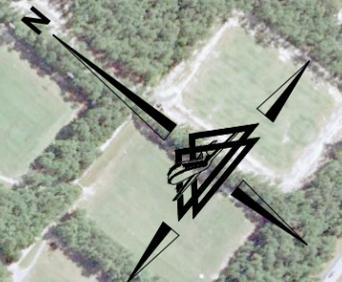
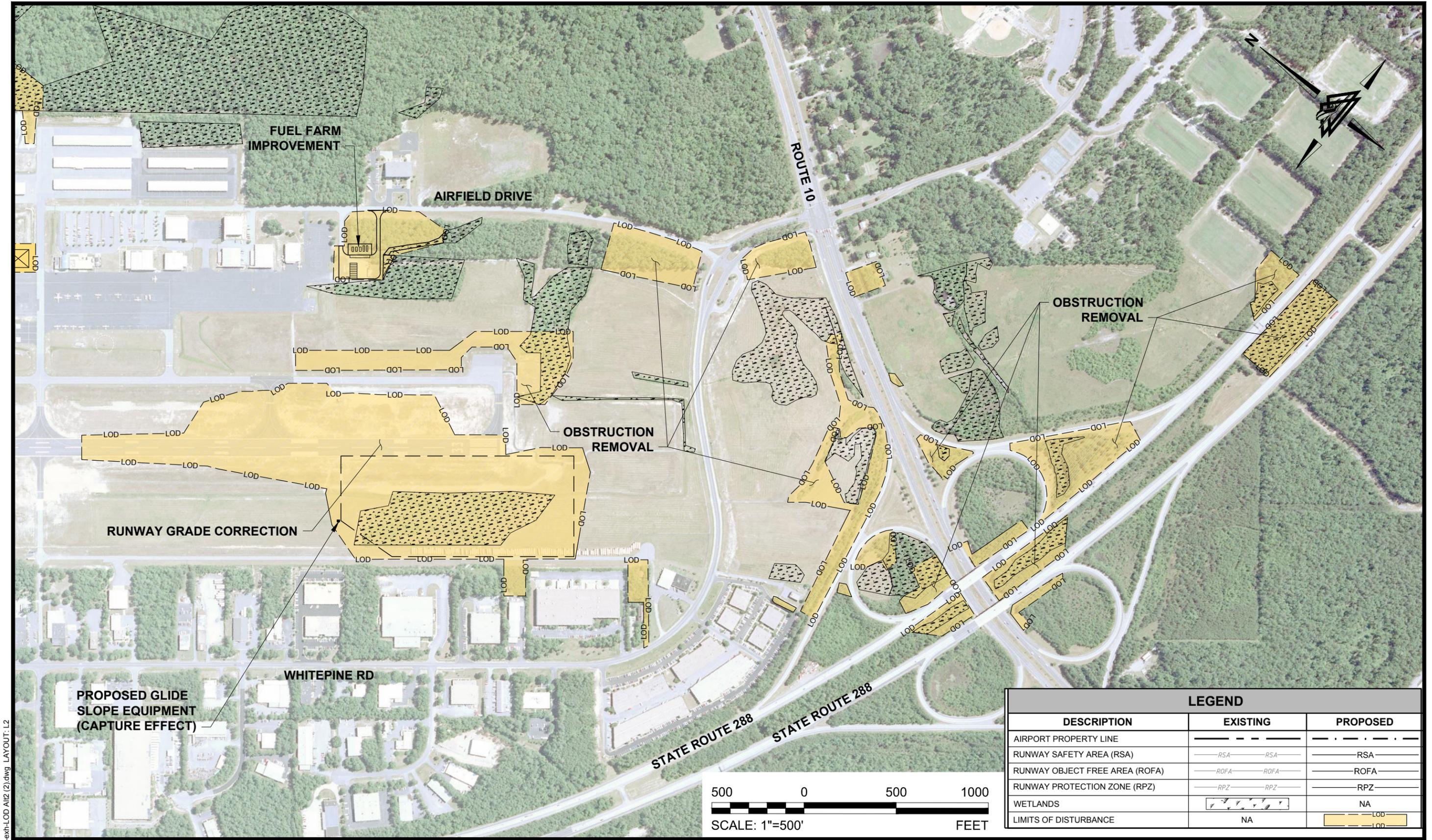
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CHESTERFIELD COUNTY AIRPORT**

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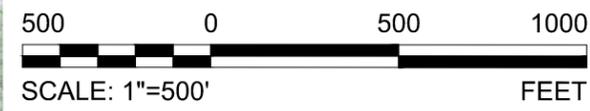


DRAWN BY: ABC CHECKED BY: DES SCALE: 1"=500' DATE: OCTOBER 2013

**EXHIBIT
10**



| LEGEND | | |
|--------------------------------|-----------------|-----------|
| DESCRIPTION | EXISTING | PROPOSED |
| AIRPORT PROPERTY LINE | — — — — — | - - - - - |
| RUNWAY SAFETY AREA (RSA) | — RSA — RSA — | — RSA — |
| RUNWAY OBJECT FREE AREA (ROFA) | — ROFA — ROFA — | — ROFA — |
| RUNWAY PROTECTION ZONE (RPZ) | — RPZ — RPZ — | — RPZ — |
| WETLANDS | | NA |
| LIMITS OF DISTURBANCE | NA | |



APPROXIMATE LIMITS OF DISTURBANCE - ALTERNATIVE 2 - SHEET 2
CHESTERFIELD COUNTY AIRPORT

EXHIBIT
11

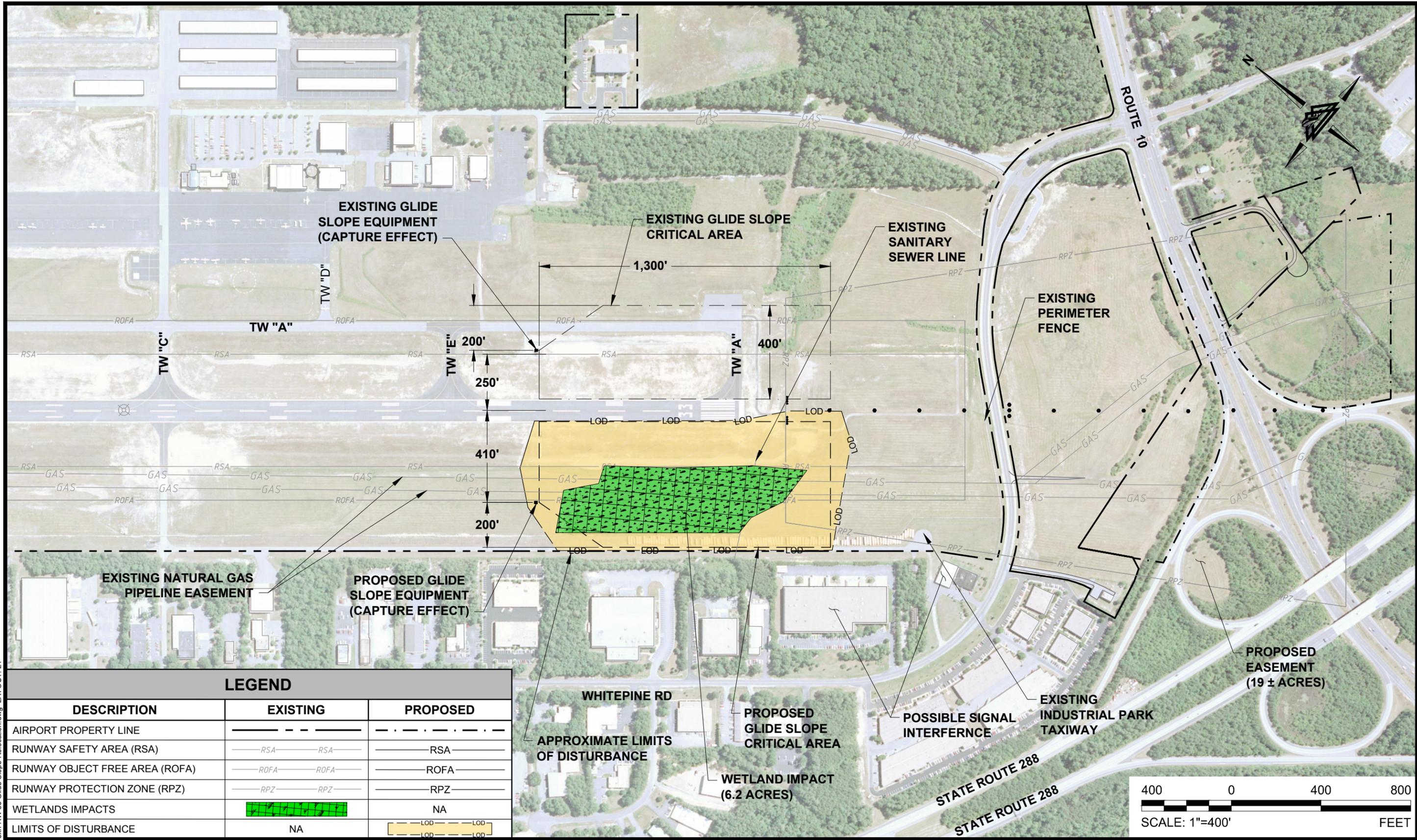
DRAWING: 10086-exh-LOD-A12 (2).dwg LAYOUT: L2



www.deltaairport.com

DRAWN BY: ABC CHECKED BY: DES SCALE: 1"=500' DATE: OCTOBER 2013

DRAWING: 10086-exh-RW 33 Glide Slope Relocation.dwg LAYOUT: L1



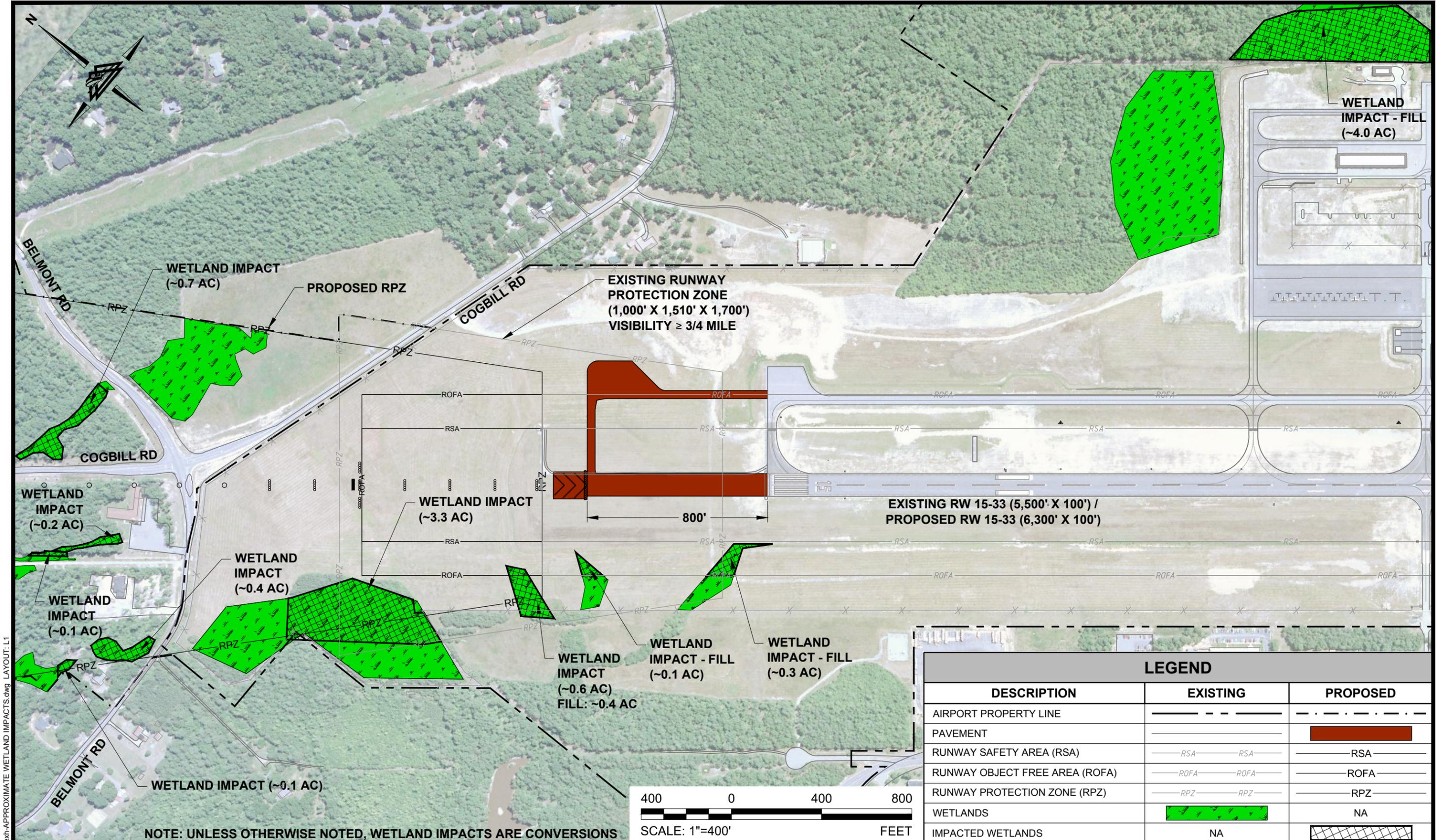
LEGEND

| DESCRIPTION | EXISTING | PROPOSED |
|--------------------------------|----------|----------|
| AIRPORT PROPERTY LINE | --- | -.-.- |
| RUNWAY SAFETY AREA (RSA) | RSA | RSA |
| RUNWAY OBJECT FREE AREA (ROFA) | ROFA | ROFA |
| RUNWAY PROTECTION ZONE (RPZ) | RPZ | RPZ |
| WETLANDS IMPACTS | | NA |
| LIMITS OF DISTURBANCE | NA | |

**RELOCATE GLIDE SLOPE TO THE WEST SIDE
CHESTERFIELD COUNTY AIRPORT**

**EXHIBIT
14**

DRAWN BY: ABC CHECKED BY: DES SCALE: 1"=400' DATE: OCTOBER 2013



**APPROXIMATE WETLAND & STREAM IMPACTS - ALTERNATIVE 2 - SHEET 1
CHESTERFIELD COUNTY AIRPORT**

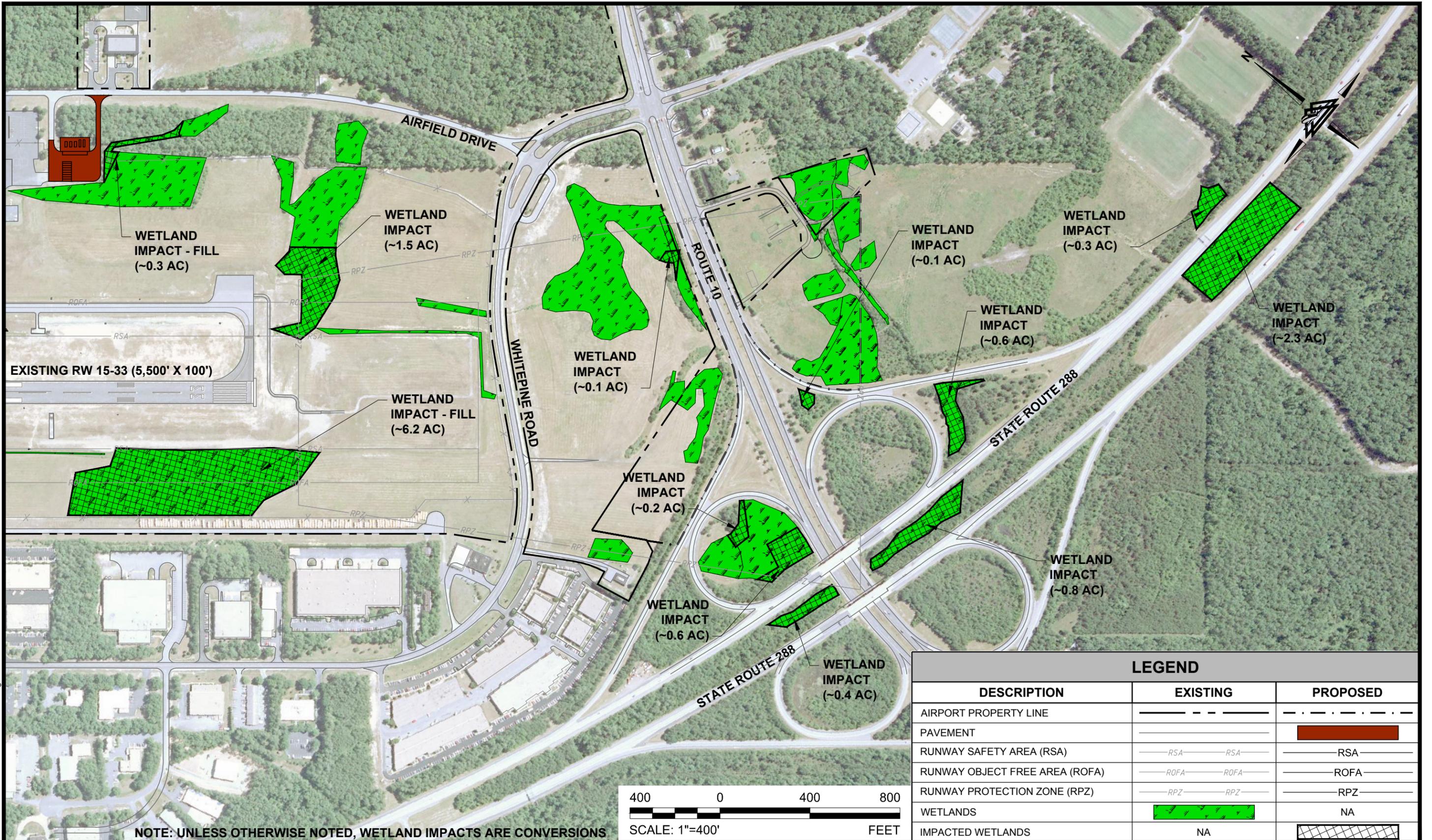
**EXHIBIT
15**

DRAWING: 10086-exh-APPROXIMATE WETLAND IMPACTS.dwg LAYOUT: L1



DRAWN BY: ABC CHECKED BY: DES SCALE: 1"=400' DATE: MARCH 2014

DRAWING: 10086-exh-APPROXIMATE WETLAND IMPACTS.dwg LAYOUT: L2



NOTE: UNLESS OTHERWISE NOTED, WETLAND IMPACTS ARE CONVERSIONS

| LEGEND | | |
|--------------------------------|-------------|----------|
| DESCRIPTION | EXISTING | PROPOSED |
| AIRPORT PROPERTY LINE | --- | --- |
| PAVEMENT | --- | █ |
| RUNWAY SAFETY AREA (RSA) | —RSA—RSA— | —RSA— |
| RUNWAY OBJECT FREE AREA (ROFA) | —ROFA—ROFA— | —ROFA— |
| RUNWAY PROTECTION ZONE (RPZ) | —RPZ—RPZ— | —RPZ— |
| WETLANDS | █ | NA |
| IMPACTED WETLANDS | NA | █ |

APPROXIMATE WETLAND & STREAM IMPACTS - ALTERNATIVE 2 - SHEET 2
CHESTERFIELD COUNTY AIRPORT

EXHIBIT
16

APPENDIX C

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST
PRELIMINARY

OBSTRUCTION REMOVAL ON SITE - EXISTING CONDITIONS
AIP and NON-AIP

CHESTERFIELD COUNTY AIRPORT
 CHESTERFIELD, VIRGINIA

AIP PROJECT NO. 3-51-0007-023-2012
 STATE PROJECT NO. CF0007-23
 DELTA PROJECT NO. 10086

DATE: April 17, 2014

| ITEM NO. | SPEC. NO. | DESCRIPTION | UNIT | QUANTITY | UNIT PRICE | TOTAL AMOUNT |
|-------------------------------------|-----------|------------------------------|------|----------|------------|------------------|
| 1 | P-100 | MOBILIZATION | LS | 1 | \$24,100 | \$24,100 |
| 2 | P-151 | CLEARING & GRUBBING | AC | 7 | \$3,000 | \$21,000 |
| 3 | P-151 | WETLAND CLEARING | AC | 2 | \$5,000 | \$8,000 |
| 4 | P-152 | UNCLASSIFIED EXCAVATION | LS | 1 | \$100,000 | \$100,000 |
| 5 | P-156 | EROSION AND SEDIMENT CONTROL | LS | 1 | \$75,000 | \$75,000 |
| 6 | T-901 | SEEDING | AC | 10 | \$2,000 | \$20,000 |
| 7 | T-908 | MULCHING | AC | 10 | \$1,500 | \$15,000 |
| 8 | | TRAFFIC CONTROL | LS | 1 | \$15,000 | \$15,000 |
| 9 | | MINOR ITEMS | LS | 1 | \$11,000 | \$11,000 |
| ESTIMATED CONSTRUCTION COST: | | | | | | \$289,100 |
| ADMIN: | | | | | | \$10,000 |
| ENGINEERING (DD & CA): | | | | | | \$57,820 |
| ESTIMATED PROJECT COST: | | | | | | \$356,920 |
| USE: | | | | | | \$360,000 |
| WETLAND MITIGATION: | | | | | | \$80,000 |
| USE: | | | | | | \$440,000 |

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST
PRELIMINARY

OBSTRUCTION REMOVAL OFF SITE - EXISTING CONDITIONS
AIP and NON-AIP

CHESTERFIELD COUNTY AIRPORT
 CHESTERFIELD, VIRGINIA

AIP PROJECT NO. 3-51-0007-023-2012
 STATE PROJECT NO. CF0007-23
 DELTA PROJECT NO. 10086

DATE: April 17, 2014

| ITEM NO. | SPEC. NO. | DESCRIPTION | UNIT | QUANTITY | UNIT PRICE | TOTAL AMOUNT |
|-------------------------------------|-----------|------------------------------|------|----------|------------|------------------|
| 1 | P-100 | MOBILIZATION | LS | 1 | \$43,400 | \$43,400 |
| 2 | P-151 | CLEARING & GRUBBING | AC | 6 | \$3,500 | \$21,000 |
| 3 | P-151 | WETLAND CLEARING | AC | 5 | \$5,500 | \$29,150 |
| 4 | P-152 | UNCLASSIFIED EXCAVATION | LS | 1 | \$100,000 | \$100,000 |
| 4 | P-156 | EROSION AND SEDIMENT CONTROL | LS | 1 | \$60,000 | \$60,000 |
| 5 | T-901 | SEEDING | AC | 12 | \$2,000 | \$24,000 |
| 6 | T-908 | MULCHING | AC | 12 | \$1,500 | \$18,000 |
| 7 | | TRAFFIC CONTROL | LS | 1 | \$15,000 | \$15,000 |
| 8 | | MINOR ITEMS | LS | 1 | \$12,000 | \$12,000 |
| ESTIMATED CONSTRUCTION COST: | | | | | | \$322,550 |
| ADMIN: | | | | | | \$10,000 |
| ENGINEERING (DD & CA): | | | | | | \$80,638 |
| ESTIMATED PROJECT COST: | | | | | | \$413,188 |
| USE: | | | | | | \$400,000 |
| WETLAND MITIGATION: | | | | | | \$265,000 |
| USE: | | | | | | \$665,000 |

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST
PRELIMINARY

INSTALL OBSTRUCTION LIGHTS
AIP

CHESTERFIELD COUNTY AIRPORT
 CHESTERFIELD, VIRGINIA

AIP PROJECT NO. 3-51-0007-023-2012
 STATE PROJECT NO. CF0007-23
 DELTA PROJECT NO. 10086

DATE: April 17, 2014

| ITEM NO. | SPEC. NO. | DESCRIPTION | UNIT | QUANTITY | UNIT PRICE | TOTAL AMOUNT |
|-------------------------------------|-----------|-------------------|------|----------|------------|-----------------|
| 1 | P-100 | MOBILIZATION | LS | 1 | \$4,400 | \$4,400 |
| 2 | L-108 | CABLE | LF | 15,000 | \$1 | \$15,000 |
| 3 | L-110 | 2' PVC CONDUIT | LF | 5,000 | \$3 | \$15,000 |
| 4 | L-119 | OBSTRUCTION LIGHT | EA | 4 | \$2,000 | \$8,000 |
| 5 | L-119 | HOUSEKEEPING PAD | EA | 4 | \$1,500 | \$6,000 |
| 6 | | MINOR ITEMS | LS | 1 | \$2,000 | \$2,000 |
| ESTIMATED CONSTRUCTION COST: | | | | | | \$50,400 |
| ADMIN: | | | | | | \$5,000 |
| ENGINEERING (DD & CA): | | | | | | \$12,600 |
| ESTIMATED PROJECT COST: | | | | | | \$68,000 |
| USE: | | | | | | \$70,000 |

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST
PRELIMINARY

EXTEND RUNWAY 15-33 ALTERNATIVE 2
AIP

CHESTERFIELD COUNTY AIRPORT
 CHESTERFIELD, VIRGINIA

AIP PROJECT NO. 3-51-0007-023-2012
 STATE PROJECT NO. CF0007-23
 DELTA PROJECT NO. 10086

DATE: April 17, 2014

| ITEM NO. | SPEC. NO. | DESCRIPTION | UNIT | QUANTITY | UNIT PRICE | TOTAL AMOUNT |
|--|-----------|---|------|----------|------------|--------------------|
| 1 | P-100 | MOBILIZATION | LS | 1 | \$241,700 | \$241,700 |
| 2 | P-150 | PAVEMENT REMOVAL | SY | 5,500 | \$5 | \$27,500 |
| 3 | P-150 | MISCELLANEOUS DEMOLITION | LS | 1 | \$10,000 | \$10,000 |
| 4 | P-152 | UNCLASSIFIED EMBANKMENT | CY | 90,000 | \$20 | \$1,800,000 |
| 5 | P152 | MUCK EXCAVATION | CY | 4,500 | \$25 | \$112,500 |
| 6 | P-156 | EROSION AND SEDIMENT CONTROL | LS | 1 | \$100,000 | \$100,000 |
| 7 | P-304 | CEMENT TREATED BASE (10") | SY | 18,000 | \$30 | \$540,000 |
| 8 | P-401 | BITUMINOUS SURFACE COURSE | TN | 5,000 | \$125 | \$625,000 |
| 9 | P-401 | RUNWAY GROOVING | SY | 7,200 | \$2 | \$14,400 |
| 10 | M-103 | LIGHTED PORTABLE CLOSED RUNWAY MARKER | EA | 2 | \$15,000 | \$30,000 |
| 11 | M-103 | CLOSED TAXIWAY MARKER | EA | 4 | \$1,000 | \$4,000 |
| 12 | M-107 | BUCKET BARRICADES | EA | 12 | \$200 | \$2,400 |
| 13 | P-619 | PAVEMENT MARKING REMOVAL | SF | 25,000 | \$2 | \$50,000 |
| 14 | P-620 | PAVEMENT MARKING (INITIAL) | SF | 25,000 | \$2 | \$50,000 |
| 15 | P-620 | PAVEMENT MARKING (FINAL) | SF | 25,000 | \$2 | \$50,000 |
| 16 | D-701 | AIRFIELD DRAINAGE | LS | 1 | \$100,000 | \$100,000 |
| 17 | L-125 | TAXIWAY EDGE LIGHTING (MITLS, CABLE, SIGNS) | LS | 1 | \$50,000 | \$50,000 |
| 18 | L-125 | RUNWAY EDGE LIGHTING (HIRLS, CABLE, SIGNS) | LS | 1 | \$50,000 | \$50,000 |
| 19 | L-125 | RELOCATE SUPPLEMENTAL WINDCONE | LS | 2 | \$7,500 | \$15,000 |
| 20 | L-125 | INSTALL NEW RUNWAY 15 REIL | LS | 1 | \$20,000 | \$20,000 |
| 21 | L-125 | RELOCATE PAPI | LS | 1 | \$25,000 | \$25,000 |
| 22 | L-125 | RELOCATE LOCALIZER | LS | 1 | \$150,000 | \$150,000 |
| 23 | T-901 | SEEDING | AC | 80 | \$2,500 | \$200,000 |
| 24 | T-904 | SODDING | SY | 1,000 | \$8 | \$8,000 |
| 25 | T-908 | MULCHING | AC | 80 | \$2,500 | \$200,000 |
| 26 | | MINOR ITEMS | LS | 1 | \$211,000 | \$211,000 |
| ESTIMATED CONSTRUCTION COST: | | | | | | \$4,686,500 |
| ADMIN: | | | | | | \$25,000 |
| ENGINEERING (DD & CA): | | | | | | \$940,000 |
| WETLAND MITIGATION: | | | | | | \$40,000 |
| RELOCATE POWERLINES UNDERGROUND | | | | | | \$250,000 |
| ESTIMATED PROJECT COST: | | | | | | \$5,691,500 |
| USE: | | | | | | \$5,700,000 |
| ITEMS NOT IDENTIFIED IN THE MASTER PLAN | | | | | | |
| RELOCATE NATURAL GAS PIPELINE VALVE STATION | | | | | | \$1,000,000 |
| RUNWAY 15-33 GRADE CORRECTION | | | | | | \$1,800,000 |
| SUBTOTAL: | | | | | | \$2,800,000 |
| TOTAL: | | | | | | \$8,500,000 |

CONSTRUCTION ITEMS IDENTIFIED IN THE MASTER PLAN

| | |
|---|--------------------|
| FEE SIMPLE/EASEMENT ACQUISITION (PHASE 2) | \$1,700,000 |
| FEE SIMPLE/EASEMENT ACQUISITION (PHASE 3) | \$1,000,000 |
| RELOCATE POWERLINES UNDERGROUND | \$250,000 |
| SUBTOTAL: | \$2,950,000 |

TOTAL: \$11,450,000

USE: **\$11,500,000**

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST
PRELIMINARY

OBSTRUCTION REMOVAL RUNWAY 15 - ALT 2
AIP

CHESTERFIELD COUNTY AIRPORT
 CHESTERFIELD, VIRGINIA

AIP PROJECT NO. 3-51-0007-023-2012
 STATE PROJECT NO. CF0007-23
 DELTA PROJECT NO. 10086

DATE: April 17, 2014

| ITEM NO. | SPEC. NO. | DESCRIPTION | UNIT | QUANTITY | UNIT PRICE | TOTAL AMOUNT |
|-------------------------------------|-----------|------------------------------|------|----------|------------|------------------|
| 1 | P-100 | MOBILIZATION | LS | 1 | \$22,000 | \$22,000 |
| 2 | P-151 | CLEARING & GRUBBING | AC | 18 | \$3,000 | \$54,000 |
| 3 | P-152 | WETLAND CLEARING | AC | 4 | \$5,000 | \$20,000 |
| 4 | P-156 | EROSION AND SEDIMENT CONTROL | LS | 1 | \$75,000 | \$75,000 |
| 5 | T-901 | SEEDING | AC | 18 | \$2,000 | \$36,000 |
| 6 | T-908 | MULCHING | AC | 18 | \$1,500 | \$27,000 |
| 7 | | TRAFFIC CONTROL | LS | 1 | \$15,000 | \$15,000 |
| 8 | | MINOR ITEMS | LS | 1 | \$10,000 | \$10,000 |
| ESTIMATED CONSTRUCTION COST: | | | | | | \$259,000 |
| ADMIN: | | | | | | \$15,000 |
| ENGINEERING (DD & CA): | | | | | | \$51,800 |
| ESTIMATED PROJECT COST: | | | | | | \$325,800 |
| USE: | | | | | | \$330,000 |
| WETLAND MITIGATION: | | | | | | \$465,000 |
| USE: | | | | | | \$795,000 |

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST
PRELIMINARY

RUNWAY BLAST PADS (AS A PART OF THE RUNWAY EXTENSION PROJECT)
AIP

CHESTERFIELD COUNTY AIRPORT
 CHESTERFIELD, VIRGINIA

AIP PROJECT NO. 3-51-0007-023-2012
 STATE PROJECT NO. CF0007-23
 DELTA PROJECT NO. 10086

DATE: April 17, 2014

| ITEM NO. | SPEC. NO. | DESCRIPTION | UNIT | QUANTITY | UNIT PRICE | TOTAL AMOUNT |
|-------------------------------------|-----------|------------------------------|------|----------|------------|------------------|
| 1 | P-150 | MISCELLANEOUS DEMOLITION | LS | 1 | \$10,000 | \$10,000 |
| 2 | P-152 | UNCLASSIFIED EMBANKMENT | CY | 1,400 | \$15 | \$21,000 |
| 3 | P152 | MUCK EXCAVATION | CY | 100 | \$25 | \$2,500 |
| 4 | P-156 | EROSION AND SEDIMENT CONTROL | LS | 1 | \$10,000 | \$10,000 |
| 5 | P-304 | CEMENT TREATED BASE (8") | SY | 3,800 | \$25 | \$95,000 |
| 6 | P-401 | BITUMINOUS SURFACE COURSE | TN | 800 | \$125 | \$100,000 |
| 7 | P-620 | PAVEMENT MARKING (INITIAL) | SF | 1,000 | \$2 | \$2,000 |
| 8 | P-620 | PAVEMENT MARKING (FINAL) | SF | 1,000 | \$2 | \$2,000 |
| 9 | | MINOR ITEMS | LS | 1 | \$12,000 | \$12,000 |
| ESTIMATED CONSTRUCTION COST: | | | | | | \$254,500 |
| ENGINEERING (DD & CA): | | | | | | \$38,175 |
| ESTIMATED PROJECT COST: | | | | | | \$292,675 |
| USE: | | | | | | \$300,000 |

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST
PRELIMINARY

INSTALL RUNWAY 15 MALSR
AIP

CHESTERFIELD COUNTY AIRPORT
 CHESTERFIELD, VIRGINIA

AIP PROJECT NO. 3-51-0007-023-2012
 STATE PROJECT NO. CF0007-23
 DELTA PROJECT NO. 10086

DATE: April 17, 2014

| ITEM NO. | SPEC. NO. | DESCRIPTION | UNIT | QUANTITY | UNIT PRICE | TOTAL AMOUNT |
|--|-----------|---|------|----------|--------------|--------------|
| 1 | P-100 | MOBILIZATION | LS | 1 | \$33,600 | \$33,600 |
| 2 | P-156 | EROSION AND SEDIMENT CONTROL | LS | 1 | \$750.00 | \$750 |
| 3 | M-103 | CLOSED RUNWAY MARKER | EA | 2 | \$1,000.00 | \$2,000 |
| 4 | M-103 | CLOSED TAXIWAY MARKER | EA | 2 | \$1,000.00 | \$2,000 |
| 5 | M-104 | TRAFFIC DRUM | EA | 5 | \$75.00 | \$375 |
| 6 | F-162 | 8' CHAIN LINK FENCE | LF | 320 | \$35.00 | \$11,200 |
| 7 | F-162 | 5' MANUAL GATES | EA | 4 | \$450.00 | \$1,800 |
| 8 | D-701 | 24" RCP, CLASS V | LF | 32 | \$55.00 | \$1,760 |
| 9 | D-701 | 24" FLARED END SECTION | EA | 4 | \$200.00 | \$800 |
| 10 | L-108 | CABLE TRENCH-MALSR | LF | 7,000 | \$2.50 | \$17,500 |
| 11 | L-108 | #8, 5KV, TYPE "C" CABLE | LF | 1,800 | \$1.00 | \$1,800 |
| 12 | L-108 | #6 BARE COUNTERPOISE-MALSR | LF | 6,400 | \$1.00 | \$6,400 |
| 13 | L-108 | #12, 600V, TYPE "C" CABLE-MALSR | LF | 20,000 | \$1.00 | \$20,000 |
| 14 | L-108 | #10, 600V, TYPE "C" CABLE-MALSR | LF | 9,100 | \$1.00 | \$9,100 |
| 15 | L-108 | #8, 600V, TYPE "C" CABLE-MALSR | LF | 4,000 | \$1.00 | \$4,000 |
| 16 | L-108 | #4, 600V, TYPE "C" CABLE-MALSR | LF | 7,000 | \$1.00 | \$7,000 |
| 17 | L-110 | 2" SCH. 40 PVC CONDUIT-MALSR | LF | 5,500 | \$2.50 | \$13,750 |
| 18 | L-110 | 3" SCH. 40 PVC CONDUIT-MALSR | LF | 600 | \$3.50 | \$2,100 |
| 19 | L-110 | 2-WAY 4" DUCTBANK | LF | 100 | \$45.00 | \$4,500 |
| 20 | L-125 | L-867 SPLICE CAN-MALSR | EA | 23 | \$550.00 | \$12,650 |
| 21 | L-125 | MALSR SYSTEM | LS | 1 | \$150,000.00 | \$150,000 |
| 22 | L-125 | MALSR ACCESS ROAD | LS | 1 | \$65,000.00 | \$65,000 |
| 23 | L-125 | MALSR VAULT WORK | LS | 1 | \$15,000.00 | \$15,000 |
| 24 | L-127 | ELECTRICAL HANDHOLE | EA | 4 | \$1,500.00 | \$6,000 |
| 25 | SP-12 | CONTINUOUS BORING CONDUIT | LF | 530 | \$30.00 | \$15,900 |
| 26 | SP-13 | IMPACT ATTEN. AND GR-2A GRDRAIL BARRIER | LS | 1 | \$10,000.00 | \$10,000 |
| | | MINOR ITEMS | LS | 1 | \$19,000 | \$19,000 |
| ESTIMATED CONSTRUCTION COST: | | | | | | \$433,985 |
| ADMIN: | | | | | | \$10,000 |
| ENGINEERING (DD & CA): | | | | | | \$86,797 |
| FLIGHT CHECK/NAVAID COMMISSION: | | | | | | \$25,000 |
| ESTIMATED PROJECT COST: | | | | | | \$555,782 |
| USE: | | | | | | \$560,000 |

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST
PRELIMINARY

REPLACE ROTATING BEACON
AIP

CHESTERFIELD COUNTY AIRPORT
 CHESTERFIELD, VIRGINIA

AIP PROJECT NO. 3-51-0007-023-2012
 STATE PROJECT NO. CF0007-23
 DELTA PROJECT NO. 10086

DATE: April 17, 2014

| ITEM NO. | SPEC. NO. | DESCRIPTION | UNIT | QUANTITY | UNIT PRICE | TOTAL AMOUNT |
|-------------------------------------|-----------|--------------------------|------|----------|------------|-----------------|
| 1 | P-100 | MOBILIZATION | LS | 1 | \$3,500 | \$3,500 |
| 2 | P-150 | MISCELLANEOUS DEMOLITION | LS | 1 | \$10,000 | \$5,000 |
| 3 | L-101 | REPLACE ROTATING BEACON | LS | 1 | \$50,000 | \$30,000 |
| 4 | | MINOR ITEMS | LS | 1 | \$1,000 | \$1,000 |
| ESTIMATED CONSTRUCTION COST: | | | | | | \$39,500 |
| ADMIN: | | | | | | \$10,000 |
| ENGINEERING (DD & CA): | | | | | | \$25,000 |
| ESTIMATED PROJECT COST: | | | | | | \$74,500 |
| USE: | | | | | | \$75,000 |

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST
PRELIMINARY

RELOCATE RUNWAY 33 GLIDE SLOPE TO WEST SIDE
AIP

CHESTERFIELD COUNTY AIRPORT
 CHESTERFIELD, VIRGINIA

AIP PROJECT NO. 3-51-0007-023-2012
 STATE PROJECT NO. CF0007-23
 DELTA PROJECT NO. 10086

DATE: April 17, 2014

| ITEM NO. | SPEC. NO. | DESCRIPTION | UNIT | QUANTITY | UNIT PRICE | TOTAL AMOUNT |
|--|-----------|---------------------------------------|------|----------|------------|--------------------|
| 1 | P-100 | MOBILIZATION | LS | 1 | \$84,300 | \$84,300 |
| 2 | P-150 | PAVEMENT REMOVAL | SY | 500 | \$5 | \$2,500 |
| 3 | P-150 | MISCELLANEOUS DEMOLITION | LS | 1 | \$25,000 | \$25,000 |
| 4 | P-151 | CLEARING & GRUBBING | AC | 5 | \$5,000 | \$25,000 |
| 5 | P-152 | UNCLASSIFIED EMBANKMENT | CY | 50,000 | \$10 | \$500,000 |
| 6 | P152 | MUCK EXCAVATION | CY | 4,500 | \$25 | \$112,500 |
| 7 | P-156 | EROSION AND SEDIMENT CONTROL | LS | 1 | \$75,000 | \$75,000 |
| 8 | M-103 | LIGHTED PORTABLE CLOSED RUNWAY MARKER | EA | 2 | \$15,000 | \$30,000 |
| 9 | M-107 | BUCKET BARRICADES | EA | 3 | \$200 | \$600 |
| 10 | D-701 | AIRFIELD DRAINAGE | LS | 1 | \$50,000 | \$50,000 |
| 11 | L-125 | RELOCATE GLIDE SLOPE EQUIPMENT | LS | 1 | \$150,000 | \$150,000 |
| 12 | T-901 | SEEDING | AC | 20 | \$2,500 | \$50,000 |
| 13 | T-904 | SODDING | SY | 2,000 | \$8 | \$16,000 |
| 14 | T-908 | MULCHING | AC | 20 | \$2,500 | \$50,000 |
| 15 | | SERVICE ROAD | LS | 1 | \$10,000 | \$10,000 |
| 16 | | SANITARY SEWER ADJUSTMENT | LS | 1 | \$10,000 | \$10,000 |
| 17 | | MINOR ITEMS | LS | 1 | \$55,000 | \$55,000 |
| ESTIMATED CONSTRUCTION COST: | | | | | | \$1,245,900 |
| ADMIN: | | | | | | \$30,000 |
| ENGINEERING (DD & CA): | | | | | | \$249,180 |
| FLIGHT CHECK/NAVAID COMMISSION: | | | | | | \$50,000 |
| ESTIMATED PROJECT COST: | | | | | | \$1,575,080 |
| USE: | | | | | | \$1,600,000 |
| WETLAND MITIGATION | | | | | | \$465,000 |
| WITH WETLANDS USE: | | | | | | \$2,000,000 |

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST
PRELIMINARY

CONSTRUCT T-HANGAR (10-UNIT LARGE)
NON-AIP

CHESTERFIELD COUNTY AIRPORT
 CHESTERFIELD, VIRGINIA

AIP PROJECT NO. 3-51-0007-023-2012
 STATE PROJECT NO. CF0007-23
 DELTA PROJECT NO. 10086

DATE: April 17, 2014

| ITEM NO. | SPEC. NO. | DESCRIPTION | UNIT | QUANTITY | UNIT PRICE | TOTAL AMOUNT |
|-------------------------------------|-----------|------------------------------|------|----------|------------|--------------------|
| 1 | P-100 | MOBILIZATION | LS | 1 | \$49,400 | \$49,400 |
| 2 | P-150 | MISCELLANEOUS DEMOLITION | LS | 1 | \$5,000 | \$5,000 |
| 3 | P-151 | CLEARING & GRUBBING | AC | 2 | \$5,000 | \$10,000 |
| 4 | P-152 | UNCLASSIFIED EMBANKMENT | CY | 5,500 | \$20 | \$110,000 |
| 5 | P152 | MUCK EXCAVATION | CY | 250 | \$25 | \$6,250 |
| 6 | P-156 | EROSION AND SEDIMENT CONTROL | LS | 1 | \$5,000 | \$5,000 |
| 7 | M-107 | AVIATION BARRICADES | LF | 300 | \$20 | \$6,000 |
| 8 | M-108 | T-HANGAR (10 UNIT) | LS | 1 | \$450,000 | \$450,000 |
| 9 | P-620 | PAVEMENT MARKING (FINAL) | SF | 1,000 | \$2 | \$2,000 |
| 10 | T-901 | SEEDING | LS | 1 | \$4,000 | \$4,000 |
| 11 | T-908 | MULCHING | LS | 1 | \$2,500 | \$2,500 |
| 12 | R-309 | CRUSHD AGGREGATE BASE COURSE | TN | 1,000 | \$30 | \$30,000 |
| 13 | R-315 | ASPHALT BASE COURSE | TN | 500 | \$100 | \$50,000 |
| 14 | R-315 | ASPHALT SURFACE COURSE | TN | 360 | \$100 | \$36,000 |
| 15 | | MINOR ITEMS | LS | 1 | \$35,000 | \$35,000 |
| ESTIMATED CONSTRUCTION COST: | | | | | | \$801,150 |
| ADMIN: | | | | | | \$10,000 |
| ENGINEERING (DD & CA): | | | | | | \$160,230 |
| ESTIMATED PROJECT COST: | | | | | | \$971,380 |
| USE: | | | | | | \$970,000 |
| WETLAND MITIGATION: | | | | | | \$200,000 |
| WITH WETLANDS USE: | | | | | | \$1,200,000 |

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST
PRELIMINARY

CONSTRUCT CONVENTIONAL HANGARS (3)
NON-AIP

CHESTERFIELD COUNTY AIRPORT
 CHESTERFIELD, VIRGINIA

AIP PROJECT NO. 3-51-0007-023-2012
 STATE PROJECT NO. CF0007-23
 DELTA PROJECT NO. 10086

DATE: April 17, 2014

| ITEM NO. | SPEC. NO. | DESCRIPTION | UNIT | QUANTITY | UNIT PRICE | TOTAL AMOUNT |
|-------------------------------------|-----------|---------------------------------|------|----------|-------------|--------------------|
| 1 | P-100 | MOBILIZATION | LS | 1 | \$220,400 | \$220,400 |
| 2 | P-150 | MISCELLANEOUS DEMOLITION | LS | 1 | \$10,000 | \$10,000 |
| 3 | P-151 | CLEARING & GRUBBING | AC | 2 | \$5,000 | \$10,000 |
| 4 | P-152 | UNCLASSIFIED EMBANKMENT | CY | 5,200 | \$20 | \$104,000 |
| 5 | P152 | MUCK EXCAVATION | CY | 250 | \$25 | \$6,250 |
| 6 | P-156 | EROSION AND SEDIMENT CONTROL | LS | 1 | \$5,000 | \$5,000 |
| 7 | M-107 | AVIATION BARRICADES | LF | 600 | \$20 | \$12,000 |
| 8 | M-108 | CONVENTIONAL HANGAR (12,000 SF) | EA | 3 | \$1,200,000 | \$3,600,000 |
| 9 | M-122 | WATER SERVICE | EA | 3 | \$10,000 | \$30,000 |
| 10 | M-122 | SANITARY SEWER SERVICE | EA | 3 | \$5,000 | \$15,000 |
| 11 | T-901 | SEEDING | LS | 1 | \$10,000 | \$10,000 |
| 12 | T-908 | MULCHING | LS | 1 | \$5,000 | \$5,000 |
| 13 | R-309 | CRUSHD AGGREGATE BASE COURSE | TN | 450 | \$30 | \$13,500 |
| 14 | R-315 | ASPHALT BASE COURSE | TN | 200 | \$100 | \$20,000 |
| 15 | R-315 | ASPHALT SURFACE COURSE | TN | 150 | \$100 | \$15,000 |
| 16 | | MINOR ITEMS | LS | 1 | \$192,000 | \$192,000 |
| ESTIMATED CONSTRUCTION COST: | | | | | | \$4,268,150 |
| ADMIN: | | | | | | \$15,000 |
| ENGINEERING (DD & CA): | | | | | | \$853,630 |
| ESTIMATED PROJECT COST: | | | | | | \$5,136,780 |
| USE: | | | | | | \$5,100,000 |
| WETLAND MITIGATION: | | | | | | \$200,000 |
| WITH WETLANDS USE: | | | | | | \$5,300,000 |

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST
PRELIMINARY

FUEL FARM IMPROVEMENTS
NON-AIP

CHESTERFIELD COUNTY AIRPORT
 CHESTERFIELD, VIRGINIA

AIP PROJECT NO. 3-51-0007-023-2012
 STATE PROJECT NO. CF0007-23
 DELTA PROJECT NO. 10086

DATE: April 17, 2014

| ITEM NO. | SPEC. NO. | DESCRIPTION | UNIT | QUANTITY | UNIT PRICE | TOTAL AMOUNT |
|-------------------------------------|-----------|-----------------------------------|------|----------|-------------|--------------------|
| 1 | P-100 | MOBILIZATION | LS | 1 | \$102,900 | \$102,900 |
| 2 | P-150 | PAVEMENT REMOVAL | SY | 2,700 | \$10 | \$27,000 |
| 3 | P-150 | MISCELLANEOUS DEMOLITION | LS | 1 | \$25,000 | \$25,000 |
| 4 | P-151 | CLEARING & GRUBBING | AC | 3 | \$5,000 | \$15,000 |
| 5 | P-152 | UNCLASSIFIED EMBANKMENT | CY | 6,000 | \$20 | \$120,000 |
| 6 | P152 | MUCK EXCAVATION | CY | 500 | \$25 | \$12,500 |
| 7 | P-156 | EROSION AND SEDIMENT CONTROL | LS | 1 | \$50,000 | \$50,000 |
| 8 | D-701 | DRAINAGE | LS | 1 | \$35,000 | \$35,000 |
| 9 | F-162 | 8' FENCE | LF | 300 | \$20 | \$6,000 |
| 10 | F-162 | 24' AUTOMATIC GATE | EA | 1 | \$10,000 | \$10,000 |
| 11 | M-110 | REMOVE EXISTING FUEL FARM | LS | 1 | \$100,000 | \$100,000 |
| 12 | M-110 | FUEL FARM EQUIPMENT & CONTAINMENT | LS | 1 | \$1,000,000 | \$1,000,000 |
| 13 | M-110 | FUEL TRUCK PARKING CONTAINMENT | LS | 1 | \$50,000 | \$50,000 |
| 14 | T-901 | SEEDING | LS | 1 | \$5,000 | \$5,000 |
| 15 | T-908 | MULCHING | LS | 1 | \$2,500 | \$2,500 |
| 16 | R-309 | CRUSHD AGGREGATE BASE COURSE | TN | 2,000 | \$30 | \$60,000 |
| 17 | R-315 | ASPHALT BASE COURSE | TN | 1,000 | \$100 | \$100,000 |
| 18 | R-315 | ASPHALT SURFACE COURSE | TN | 750 | \$100 | \$75,000 |
| 19 | | MINOR ITEMS | LS | 1 | \$84,000 | \$84,000 |
| ESTIMATED CONSTRUCTION COST: | | | | | | \$1,879,900 |
| ADMIN: | | | | | | \$15,000 |
| ENGINEERING (DD & CA): | | | | | | \$375,980 |
| ESTIMATED PROJECT COST: | | | | | | \$2,270,880 |
| USE: | | | | | | \$2,300,000 |
| WETLAND MITIGATION: | | | | | | \$50,000 |
| WITH WETLANDS USE: | | | | | | \$2,300,000 |

APPENDIX D

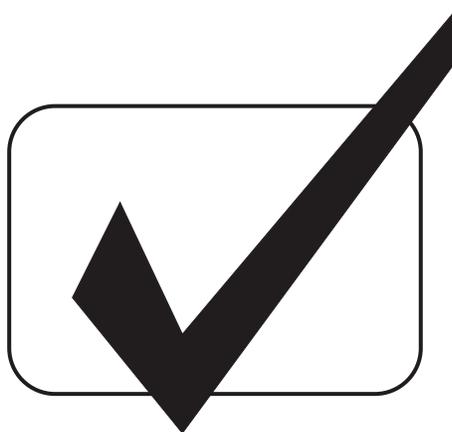
PERMITS – CHECKLIST & FORMS

Chesterfield County Site Plan Application & Checklist
Chesterfield County Land Disturbance Application Procedures

4-15-13

Chesterfield County

***SITE PLAN
APPLICATION
&
CHECKLIST***



**Please complete this Application, print it and deliver it with your plans to:
Chesterfield County Planning Department
9800 Government Center Parkway
Chesterfield, VA 23832**



**Chesterfield County
Planning Department
Chesterfield, VA 23832**

*Planning to sustain,
build and enhance
Chesterfield County*

tel: (804) 748-1050
fax: (804) 717-6295
website:
www.chesterfield.gov/plan

| FOR OFFICE USE ONLY | |
|---------------------|-----------------------------|
| Rec'd by _____ | Case No. _____ |
| Date Rec'd _____ | Fee Amount _____ |
| Time Rec'd _____ | Receipt No. _____ |
| Reviewed by _____ | Anticip. Hearing Date _____ |

SITE PLAN REVIEW APPLICATION

(commercial, industrial, multi-family, office and/or institutional)

APPLICANT TO COMPLETE THE FOLLOWING INFORMATION IN FULL

Project Name: _____

Location: _____

Approx. # feet to nearest intersection: _____

Enterprise Zone? Yes No

Reviewed and approved by (check one):

- Director of Planning (A) (Admin. Review)
- Planning Commission (C) (Public Hearing)
- Attached Letter of Designated Authorized Representative (required)

Project Type (check one):

- Agricultural (AG) Commercial (C)
- Industrial (I) Multi-Family (MF)
- Public/Semi-Public (PS) Mixed Use

Submittal Type with # of plans required to be submitted for review (check one):

- Erosion Control (4)
- Development Standards Waiver (8)
- Landscape Plan (2)
- Minor Site Plan (8)
- Schematic (8)
- Site Plan (13)
- Appeal (no plans)
- Site Plan Adjustment (12) Case# _____

Statistical Summary:

- A. Hotel/motel (Y/N) # of rooms _____
- B. Multi-family/condo/mobile home (Y/N) _____
- C. # of dwelling units _____
- D. Maximum building height in feet _____
- E. Number of floors _____
- F. Number of buildings _____
- G. Total gross bldg. Sq. ft. _____
- H. Public water (Yes / No) _____
- I. Public sewer (Yes / No) _____
- J. Total site acreage _____
- K. Total disturbed acreage (base fee on this amount) _____

List all related zoning cases & attach copies of all approved minutes:

Comments: _____

APPLICANT INFORMATION

If applicant or others associated with project are not already registered with the planning department, please complete applicant registration form. Previously registered information must be verified for accuracy.

| | |
|---|-------------------|
| Applicant One _____ (Owner and/or Developer) | Regist. No. _____ |
| Applicant Two _____ (Co-Applicant) | Regist. No. _____ |
| Agent One _____ (Site Design Consultant) | Regist. No. _____ |
| Agent Two _____ (Attorney or other) | Regist. No. _____ |

SUBJECT PARCEL INFORMATION

This data can be obtained from the Planning Department.
 Tel (804) 748-1050 Fax (804) 717-6295 E-mail: planning@chesterfield.gov

Attach a GIS map showing location(s) of subject parcel(s).
 Contact Environmental Engineering at (804) 748-1035.

Submitted with (check one) Site Plan Minor Site Plan

FOR OFFICE USE ONLY

| | | | | | | | | |
|---------|--|---|--------------|--------|-------------------|--------------|----------------------|-----------|
| GPIN | | Partial Parcel? | Site Acreage | Zoning | Existing Land Use | Zoning Sheet | Magisterial District | Plan Area |
| Address | | YES <input type="checkbox"/> NO <input type="checkbox"/> | | | | | | |
| | | | | | | | | |
| GPIN | | Partial Parcel? | Site Acreage | Zoning | Existing Land Use | Zoning Sheet | Magisterial District | Plan Area |
| Address | | YES <input type="checkbox"/> NO <input type="checkbox"/> | | | | | | |
| | | | | | | | | |
| GPIN | | Partial Parcel? | Site Acreage | Zoning | Existing Land Use | Zoning Sheet | Magisterial District | Plan Area |
| Address | | YES <input type="checkbox"/> NO <input type="checkbox"/> | | | | | | |
| | | | | | | | | |
| GPIN | | Partial Parcel? | Site Acreage | Zoning | Existing Land Use | Zoning Sheet | Magisterial District | Plan Area |
| Address | | YES <input type="checkbox"/> NO <input type="checkbox"/> | | | | | | |
| | | | | | | | | |
| GPIN | | Partial Parcel? | Site Acreage | Zoning | Existing Land Use | Zoning Sheet | Magisterial District | Plan Area |
| Address | | YES <input type="checkbox"/> NO <input type="checkbox"/> | | | | | | |
| | | | | | | | | |
| GPIN | | Partial Parcel? | Site Acreage | Zoning | Existing Land Use | Zoning Sheet | Magisterial District | Plan Area |
| Address | | YES <input type="checkbox"/> NO <input type="checkbox"/> | | | | | | |
| | | | | | | | | |
| GPIN | | Partial Parcel? | Site Acreage | Zoning | Existing Land Use | Zoning Sheet | Magisterial District | Plan Area |
| Address | | YES <input type="checkbox"/> NO <input type="checkbox"/> | | | | | | |
| | | | | | | | | |
| GPIN | | Partial Parcel? | Site Acreage | Zoning | Existing Land Use | Zoning Sheet | Magisterial District | Plan Area |
| Address | | YES <input type="checkbox"/> NO <input type="checkbox"/> | | | | | | |
| | | | | | | | | |

INVESTIGATION WORKSHEET FOR GRAVES, MEMORIALS AND PLACES OF BURIAL

SUBMITTED WITH THE FOLLOWING (CHECK ONE)

- Site Plan Application Minor Site Plan Application Tentative Subdivision Application
 Final Check Subdivision Application Parcel Plat

I have investigated property located at _____

And described as _____ and _____ which is
(Geographic Parcel Identification Number) (Tax Map Number)

undergoing either site plan or subdivision review by Chesterfield County and find that:

Select One: Graves, objects or structures marking places of burial **exist** on the property.

Graves, object or structures marking places of burial **do not exist** on the property.

This information was verified by (check one or more)

- Deed Description Visual Verification
 Soil Borings Other (specify) _____

Any such feature has been identified on the proposed Site Plan or Subdivision Plat and generally is comprised by the following: _____

Signature: _____ Date: _____

Printed Name: _____ Phone Number: _____

The following space is for use by the Historical Society

Verified by: _____ Phone Number: _____

Date: _____ Fax Number: _____

Comments: _____

Submitted with (check one):

- Site Plan
- Minor Site Plan
- Subdivision Plan

SITE UTILIZATION SURVEY FORM

CHESTERFIELD COUNTY
 INDUSTRIAL WASTE PRETREATMENT PROGRAM
 DEPARTMENT OF UTILITIES
 P.O. BOX 608
 CHESTERFIELD COUNTY, VIRGINIA 23832-9998



BUSINESS NAME: _____ ACCOUNT NUMBER: _____

SERVICE ADDRESS: _____ SIC CODE # _____
(Standard Industrial Classification)

MAILING ADDRESS: _____ SIC CODE TITLE/DESCRIPTION/GROUP: _____
(City/County) _____ (State) _____

PHONE NUMBER: () _____

CERTIFICATION STATEMENT

I CERTIFY THAT THE INFORMATION PROVIDED IS TRUE AND REPRESENTS, TO THE BEST OF MY KNOWLEDGE, THE INFORMATION REQUESTED. I ALSO ACKNOWLEDGE THAT I AM THE MOST QUALIFIED PERSON ON SITE TO ASSESS THE OPERATIONS OF THIS BUSINESS.

 SIGNATURE TITLE COMPANY NAME DATE

PRINT or TYPE NAME

| QUESTIONS | YES Y | NO Y |
|--|----------|---------|
| Does the facility utilize Chesterfield County's Sanitary Sewer System? If YES, please answer the following: Average Estimated Daily Wastewater Discharged _____ Gallons/CCF per day (You may write in the CCF total from your most recent water bill in lieu of gallons per day) Total Number of Employees _____ | — | — |
| Are hauled waste services utilized at any time of the year? If yes, please check all that apply: Septic Tank <input type="checkbox"/> Grease Trap <input type="checkbox"/> Grit Trap <input type="checkbox"/> Oil/Water Separator <input type="checkbox"/> Other: (describe) _____ | — | — |
| Is this facility located in a strip mall or other multi-unit building? | — | — |
| Does your business discharge, or have the potential to discharge, a waste product to the sewer system <i>OTHER THAN</i> normal sanitary wastewater? | — | — |

5. Provide a brief description of the business(es) at this address. Also, list any operations or processes which may be associated with this address.

Submitted with (check one):

Site Plan

Minor Site Plan

**SIZING WATER SERVICE LINES AND METERS
DEPARTMENT OF UTILITIES CHESTERFIELD COUNTY, VA**

| | | | |
|---|--|-------------------------------|---|
| Business Name: | | Address of Building: | |
| Development Name: | | Project Number | Type of Use _____ Map I.D. No. _____ |
| I certify that the information on this form is true and correct. | | | |
| Applicant Name (Print) _____ | | Phone # _____ | |
| (Signature) _____ | | (Local Phone # Desired) _____ | |

| PART A | Fixture Value | | No. of | | Fixture |
|----------------------------------|---------------|---|-----------------|---|--------------|
| <u>Fixture</u> | <u>35 psi</u> | | <u>Fixtures</u> | | <u>Value</u> |
| Bathtub | 8 | x | _____ | = | _____ |
| Bedpan Washers | 10 | x | _____ | = | _____ |
| Combination Sink and Tray | 3 | x | _____ | = | _____ |
| Dental Unit | 1 | x | _____ | = | _____ |
| Dental Lavatory | 2 | x | _____ | = | _____ |
| Drinking Fountain - Cooler | 1 | x | _____ | = | _____ |
| - Public | 2 | x | _____ | = | _____ |
| Kitchen Sink - 2" Connection | 3 | x | _____ | = | _____ |
| - : " Connection | 7 | x | _____ | = | _____ |
| Lavatory - d" Connection | 2 | x | _____ | = | _____ |
| - 2" Connection | 4 | x | _____ | = | _____ |
| Laundry Tray - 2" Connection | 3 | x | _____ | = | _____ |
| - : " Connection | 7 | x | _____ | = | _____ |
| Shower Head (Shower Only) | 4 | x | _____ | = | _____ |
| Service Sink - 2" Connection | 3 | x | _____ | = | _____ |
| - : " Connection | 7 | x | _____ | = | _____ |
| Urinal - Pedestal Flush Valve | 35 | x | _____ | = | _____ |
| - Wall Flush Valve | 12 | x | _____ | = | _____ |
| - Trough (2 Ft. Unit) | 2 | x | _____ | = | _____ |
| Wash Sink (Each Set of Faucets) | 4 | x | _____ | = | _____ |
| Water Closet - Flush Valve | 35 | x | _____ | = | _____ |
| - Tank Type | 3 | x | _____ | = | _____ |
| Dishwasher - 2" Connection | 5 | x | _____ | = | _____ |
| - : " Connection | 10 | x | _____ | = | _____ |
| Washing Machine - 2" Connection | 5 | x | _____ | = | _____ |
| - : " Connection | 12 | x | _____ | = | _____ |
| - 1" Connection | 25 | x | _____ | = | _____ |
| Hose Connection (Wash Down) - 2" | 6 | x | _____ | = | _____ |
| - : " | 10 | x | _____ | = | _____ |
| Hose (50 Ft. Wash Down) - 2" | 6 | x | _____ | = | _____ |
| - e" | 9 | x | _____ | = | _____ |
| - : " | 12 | x | _____ | = | _____ |

Combined Fixture Value Total = _____

***** - OR - *****

PART B

(1) Domestic Demand (Verification by County Staff - See Conversion Table) = _____ gpm

(2) Fixed Demand (To include all demands except for domestic & irrigation) = _____ gpm

(3) Irrigation Demand (From Data Supplied by Site Engineer) = _____ gpm

(4) Total Demand = _____ gpm

(5) Meter Size based on Total Demand = _____

(Verification by Co. Staff - Use Water Meter Sizing Table)

COUNTY USE ONLY Node No. _____ Actual Meter Size _____ Virtual Meter Size _____

Sized By _____ Date _____ Sewer _____



Chesterfield County Fire Department – Plans Review
Fire Flow Estimate Form
 International Fire Code Method of Calculating NFF (Needed Fire Flow)

Engineer: _____ Date: _____

Project Name and Address: _____ Calc By: _____

Type of Construction – Based on 2006 Edition of the International Building Code

Number of Stories: _____

Total Ground Floor Area – Including Projections (Canopies, Loading Docks, Etc): _____

Total Area of Other Floors – Including Basements _____

Total Building Area in Square Feet _____

FIRE AREA CONSIDERED: _____

Note: In order to apply the reduction in area for a building, a fire resistive rated FIRE WALL without openings

shall be provided. WITHOUT OPENINGS refers to no penetrations being permitted (i.e. – doors, duct penetrations, pipe penetrations. (B104.2)

Fire Resistive Rating of FIRE WALL _____ (Hours)

Area In Square Feet Between FIRE WALL or Either Side _____

Required Fire Flow from International Fire Code – Table B105.1 _____

Fire Flow Duration in Hours from International Fire Code – Table B105.1 _____

NEEDED FIRE FLOW : (Based on Total Adjusted Square Foot Area)

Automatic Sprinklers (YES ___ NO ___) Reduction Factor (75% max) _____ % x
 (NFF) _____ = _____ **GPM**

TOTAL GPM: _____

NOTE: MINIMUM REQUIRED FIRE FLOW NOT LESS THAN 1500 GPM
 AT MINIMUM 20 PSI RESIDUAL PRESSURE

FIRE HYDRANTS AND SPACING:

REQUIRED MINIMUM NUMBER OF FIRE HYDRANTS (IFC Table C105.1)

AVERAGE SPACING BETWEEN FIRE HYDRANTS (IFC Table C105.1)

I CERTIFY THAT THE ABOVE INFORMATION IS TRUE AND CORRECT.

SIGNATURE: _____ **P.E.**

(SIGNATURE REQUIRED)

Reference: 2006 Edition International Fire Code, Appendix B, C, and D

**LICENSE AGREEMENT FOR
CHESTERFIELD COUNTY GIS HARDCOPY MAP PRODUCTS**

This Agreement is made and entered into this _____ day of _____, 20____, by and between the COUNTY OF CHESTERFIELD, VIRGINIA, a political subdivision of the Commonwealth of Virginia, hereinafter referred to as "COUNTY" and _____, hereinafter referred to as "LICENSEE."

WHEREAS, the COUNTY has printed maps describing the physical characteristics, jurisdictions, divisions, and subdivisions of Chesterfield County, hereinafter referred to as 'GIS Maps.'

WHEREAS, the LICENSEE desires to obtain a limited license to copy certain GIS Maps upon the terms and conditions hereinafter set forth:

NOW, THEREFORE, in consideration of the payment noted in Addendum I and the mutual covenants contained herein, the LICENSEE and the COUNTY hereby agree as follows:

1. **LICENSE.**

A. The COUNTY hereby grants to the LICENSEE a nontransferable and nonexclusive right to copy the GIS Map entitled:

Tax Map Number: _____

OR

GPIN Number: _____

Tax Map Centered on coordinates:

 County Wall Map Titled: _____

Date Produced: _____

Purchased on _____ day of _____, 20____, for a fee noted on Addendum I.

B. The LICENSEE agrees not to alter or misrepresent map symbology.

C. The LICENSEE must print the following statement adjacent to the map or portion of map copied from the original:

Copyright 1997 Chesterfield County, Virginia, Department of Environmental Engineering, P. O. Box 40, Chesterfield, Virginia 23832. The information on this publication may not be copied or reproduced in any form without permission in writing from the copyright owner.

Every effort has been made to verify the information contained in this publication. The County assumes no liability for damages arising from errors or omissions. Users

are urged to notify Chesterfield County of inconsistencies so that corrections can be made in future publications. Phone (804) 748-1035 or write to Chesterfield County Department of Environmental Engineering, P. O. Box 40, Chesterfield, Virginia 23832.

FOR THE LICENSEE:

FOR CHESTERFIELD COUNTY:

Name: _____

Name: _____

Title: _____

Title: _____

Institution Name:

Signature: _____

Signature: _____

Date: _____

Date: _____

License Agreement

APPLICATION FEE CALCULATION SHEET

| APPLICATION REQUEST | FEE AMOUNT | |
|--|------------|--|
| TYPE: _____ BASE FEE | | |
| Zoning or Disturbed Acreage _____ X \$ _____.____ | | |
| # of Subdivision Lots _____ X \$ _____.____ | | |
| TYPE: _____ BASE FEE | | |
| Zoning or Disturbed Acreage _____ X \$ _____.____ | | |
| # of Subdivision Lots _____ X \$ _____.____ | | |
| TYPE: _____ BASE FEE | | |
| Zoning or Disturbed Acreage _____ X \$ _____.____ | | |
| # of Subdivision Lots _____ X \$ _____.____ | | |
| GENERAL NOTES: <div style="text-align: right; margin-top: 10px;">TOTAL AMOUNT</div> | | |

Please make check payable to: **Treasurer of Chesterfield County**



Submitted with (check one):

- Site Plan Application
- Minor Site Plan Application
- Subdivision Plan Application

CHESTERFIELD COUNTY

REGISTRATION FORM for APPLICANT or AGENT

Client # _____

OFFICE USE ONLY

Registration Code (check one):

- Developer
or
 Agent (Select type):
- Engineer Surveyor Lawyer
 Landscape Architect Other

Individual or Business Name _____

Contact Person (if business name listed above) _____

Fax Number (_____) _____ E-Mail _____

Address _____

City _____ State _____ Zip Code _____

Area Code (_____) Phone Number (H) _____ (W) _____

Mailing Address (if different from address listed above) _____

City _____ State _____ Zip Code _____

**Please complete the above form, print and submit it to the
Chesterfield County Planning Department. Thank you.**

SUBMITTAL CHECKLIST

ALL OF THE ITEMS LISTED BELOW MUST BE PROVIDED in order for your plans to be accepted for review. Please complete, print your name at the bottom and provide your telephone number. Please telephone the Planning Department at 748-1050 if you have any questions.

| <u>ITEM NUMBER</u> | <u>SHEET</u> | | | | | | |
|--|--|------------|----------------------|--|----------------------|----------|--|
| 1. Project Name (on cover sheet & in title block of all sheets) | _____ | | | | | | |
| 2. Geographic Parcel Identification Number(s) (GPIN) (shown on the title sheet & layout/site plan sheet) | _____ | | | | | | |
| 3. Name, street address, phone & fax number of the developer owner/agent shown on the title sheet & layout sheet. The same information is needed for the person preparing the plan. | _____ | | | | | | |
| 4. Location Map shown on the title sheet & layout sheet and shall be correct and clear. | _____ | | | | | | |
| 5. Zoning of all adjacent property shown on the layout sheet. | _____ | | | | | | |
| 6. On site plan applications, and on the site plan, list the zoning of the property and all zoning, variance, substantial accord, and other cases that pertain to the site must be shown. Also, label which development district the site is in: Emerging Growth, Post Development, Jefferson Davis Corridor, Village District or other district. | _____ | | | | | | |
| 7. List on the site plan the existing/proposed uses in the building and/or site. | _____ | | | | | | |
| 8. An erosion and sediment control program administration fee must be included as follows: | | | | | | | |
| <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; width: 60%;"><u>Area of Land Disturbance</u></th> <th style="text-align: left;"><u>Fee</u></th> </tr> </thead> <tbody> <tr> <td>10,000 SF or greater</td> <td>\$1360.00 plus \$60 per disturbed acre</td> </tr> <tr> <td>2,500 SF to 9,000 SF</td> <td>\$100.00</td> </tr> </tbody> </table> | <u>Area of Land Disturbance</u> | <u>Fee</u> | 10,000 SF or greater | \$1360.00 plus \$60 per disturbed acre | 2,500 SF to 9,000 SF | \$100.00 | |
| <u>Area of Land Disturbance</u> | <u>Fee</u> | | | | | | |
| 10,000 SF or greater | \$1360.00 plus \$60 per disturbed acre | | | | | | |
| 2,500 SF to 9,000 SF | \$100.00 | | | | | | |
| 9. The plans must bear a signed certification seal of a professional engineer, certified land surveyor, or architect with original signature and dated on cover. | _____ | | | | | | |

ITEM NUMBER

SHEET

- 10. An erosion and sediment control plan must be provided with construction narrative and erosion control details. _____
- 11. A drainage area map is required for all on-site or off-site drainage areas. (Maximum scale of 1"=200') _____
- 12. Existing and proposed grading contours must be provided on the plan and must have their elevations clearly labeled. _____
- 13. Calculations must be submitted to support the design of all proposed culverts, open ditches, drop inlets, and storm sewers on VDOT standard calculation sheets. _____
- 14. Profiles must be shown for all proposed storm sewer and outfall channels. _____
- 15. A highly visible note must be provided on the first sheet showing how compliance with the Chesapeake Bay Preservation Ordinance has been accomplished. If compliance has been achieved through the opt-out procedure, the name of the person who performed the CBPA Opt-Out and date of the approval must be shown. _____
- 16. A data map must be submitted which outlines all drainage areas, impervious areas (existing and proposed), RPA and RMA limits, etc. which were used in determining compliance with the Chesapeake Bay Preservation Ordinance. _____
- 17. A copy of the Water Quality Section approval letter for the Resource Protection Area Designation, if applicable, must be provided. _____
- 18. If public water and/or sewer are to be used, the plan must clearly depict the location and alignment of all proposed lines and how they will connect to the existing utility system. _____
- 19. Profiles must be shown for all proposed public water and/or sewer line extension. _____
- 20. Show required and proposed parking calculations based upon parking requirements listed in the Zoning Ordinance. _____
- 21. Provide IFC fire flow calculations on the plans. _____

ITEM NUMBER

SHEET

- 22. A site plan review fee must be included per Section 19-25 of the Chesterfield County Zoning Ordinance. (You may call the Planning Department to verify required fees at 804-748-1050) _____
- 23. Submit completed copy of the VDOT Pre-construction Checklist including consultant's signature. _____
- 24. Submit completed copy of the VDOT Site Construction Plan Checklist including consultant's signature. _____
- 25. Thirteen (13) FOLDED sets of plans. _____
- 26. Applications that are to be heard by the Planning Commission required an 8 1/2" X 11" or 8 1/2" X 14" reduction copy of the site plan for staff reports. _____

Applicant's Name

Phone Number

Consultant's Name

Phone Number

You can assist the Planning Department front counter staff and speed up acceptance of your plans if you bring a GIS map from Environmental Engineering with your site centered on the map. The cost of \$1.00. For your own use, you can also get these GIS maps with existing water, sewer and fire hydrant information for \$2.00 a map. Topography on the GIS maps cost \$12.00 (with water, sewer and fire hydrants included).

REV: November 6, 2012



Submitted with (check one):

Site Plan Application

Minor Site Plan Application

Subdivision Plan Application

**SUBDIVISION AND SITE CONSTRUCTION PLAN
SUBMITTAL CHECKLIST
CHESTERFIELD COUNTY**

CHESTERFIELD RESIDENCY

| | |
|------------------------------|------------------------|
| PROJECT NAME _____ | DATE _____ |
| DEVELOPER/OWNER _____ | TELEPHONE _____ |
| ADDRESS _____ | ZIP _____ |

| GENERAL INFORMATION | | | | |
|----------------------------|---|--------------------------|--------------------------|-----------------|
| | PLAN SHEET TO INCLUDE: | YES | NO | COMMENTS |
| 1. | Project Name. Owner/Developer name, address, telephone and fax number. | <input type="checkbox"/> | <input type="checkbox"/> | |
| 2. | Date of plan. | <input type="checkbox"/> | <input type="checkbox"/> | |
| 3. | Standard cover sheet with surveying & mapping control information. Vicinity map (1" = 2000') & title block information section completed. | <input type="checkbox"/> | <input type="checkbox"/> | |
| 4. | North arrow, designation of north orientation, match lines, scale & sheet numbers for each sheet. | <input type="checkbox"/> | <input type="checkbox"/> | |
| 5. | Seal & signature of registered professional engineer or land surveyor on each sheet.. | <input type="checkbox"/> | <input type="checkbox"/> | |
| 6. | Total acreage, current zoning & proposed zoning by acres. | <input type="checkbox"/> | <input type="checkbox"/> | |
| 7. | Adjacent parcel identification: tax map reference numbers, owners names, & present zoning/use of all abutting parcels. | <input type="checkbox"/> | <input type="checkbox"/> | |
| 8. | Date of tentative approval with case number. | <input type="checkbox"/> | <input type="checkbox"/> | |
| 9. | Master plan (all phases or proposed sections). | <input type="checkbox"/> | <input type="checkbox"/> | |
| 10. | Complete site layout: sequential numbering & size (in sq. ft.) of each proposed lot and/or unit. | <input type="checkbox"/> | <input type="checkbox"/> | |
| 11. | State route numbers & names on all existing streets to which connections are to be made. | <input type="checkbox"/> | <input type="checkbox"/> | |
| 12. | All proposed street names. | <input type="checkbox"/> | <input type="checkbox"/> | |
| 13. | Right-of-way lines, width, centerline (stationed at 100' intervals) limits of construction & pavement width or back of curb width. | <input type="checkbox"/> | <input type="checkbox"/> | |
| 14. | General notes explaining details of plan. | <input type="checkbox"/> | <input type="checkbox"/> | |

PROJECT NAME _____

| GENERAL INFORMATION (CONTINUED) | | | | | |
|--|---|--------------------------|--------------------------|-----------------|--|
| PLAN SHEET TO INCLUDE: | | YES | NO | COMMENTS | |
| 15. | Existing and/or proposed dams, detention basins & any extrinsic structures. | <input type="checkbox"/> | <input type="checkbox"/> | | |
| 16. | Grading plan: existing contours, proposed contours, finished floor elevations, design layout for drainage system. | <input type="checkbox"/> | <input type="checkbox"/> | | |
| 17. | Legend detailing graphic descriptions for all Road items, drainage & utility items shown. | <input type="checkbox"/> | <input type="checkbox"/> | | |
| 18. | Any zoning waivers, variances, proffers and/or imposed conditions for the project submitted with the plans. | <input type="checkbox"/> | <input type="checkbox"/> | | |
| 19. | Written description of all plan revisions shall accompany all revised plans submitted for re-evaluation & approval. | <input type="checkbox"/> | <input type="checkbox"/> | | |

| GEOMETRICS | | | | | |
|-------------------------------|--|--------------------------|--------------------------|-----------------|--|
| PLAN SHEET TO INCLUDE: | | YES | NO | COMMENTS | |
| 1. | Location of project entrance & distance measured to nearest intersection of state route or crossovers for field verification of sight distance. | <input type="checkbox"/> | <input type="checkbox"/> | | |
| 2. | Existing entrance, street connections, crossovers, etc., located along state route that may be affected by the development. | <input type="checkbox"/> | <input type="checkbox"/> | | |
| 3. | Existing and proposed rights-of-way, width & route number. | <input type="checkbox"/> | <input type="checkbox"/> | | |
| 4. | Centerline curve data: delta, radius, arc length, chord & tangent, stationing at intersections, PC's, PT's, etc. | <input type="checkbox"/> | <input type="checkbox"/> | | |
| 5. | Actual line & length of horizontal and vertical sight distance at street intersections & any sight distance easements which may be required. A profile is required. | <input type="checkbox"/> | <input type="checkbox"/> | | |
| 6. | Depending on method of stormwater conveyance, either radius of all curb returns to back of curb or fillet radius to edge of pavement. Label entrance standard CG-11 and any curb and gutter standards. | <input type="checkbox"/> | <input type="checkbox"/> | | |
| 7. | Proposed building location, use sq. footages & offset distance to property lines (sites only). | <input type="checkbox"/> | <input type="checkbox"/> | | |
| 8. | All temporary turnaround construction & easements as indicated on the preliminary plans (including radii). | <input type="checkbox"/> | <input type="checkbox"/> | | |
| 9. | All proposed property frontage & intersection improvements within the right-of-way. | <input type="checkbox"/> | <input type="checkbox"/> | | |
| 10. | Complete dimensions of existing & proposed deceleration, left & right turn storage lanes. | <input type="checkbox"/> | <input type="checkbox"/> | | |
| 11. | Road classification schedule with pavement designs. | <input type="checkbox"/> | <input type="checkbox"/> | | |
| 12. | Complete typical sections based on Road classifications. | <input type="checkbox"/> | <input type="checkbox"/> | | |
| 13. | Guardrail where required. | <input type="checkbox"/> | <input type="checkbox"/> | | |
| 14. | CG-12 where required. | <input type="checkbox"/> | <input type="checkbox"/> | | |

PROJECT NAME _____

| PROFILE AND GRADE | | | | |
|------------------------|--|--------------------------|--------------------------|----------|
| PLAN SHEET TO INCLUDE: | | YES | NO | COMMENTS |
| 1. | Existing ground line at centerline, left & right (along edge of Right-of-way). | <input type="checkbox"/> | <input type="checkbox"/> | |
| 2. | Finished grade line for mainline & connections. | | | |
| | a. Percent of grade, change of grade elevations (PVI) & length of curves. | <input type="checkbox"/> | <input type="checkbox"/> | |
| | b. Finished grade elevations (50' tangent, 25' curve) & at intersections, PC's, PT's, PVC's, PVT's, etc. | <input type="checkbox"/> | <input type="checkbox"/> | |
| | c. Complete stationing at intersections, PC's, PT's, PVC's, PVT's, etc. | <input type="checkbox"/> | <input type="checkbox"/> | |
| | d. Street names. | <input type="checkbox"/> | <input type="checkbox"/> | |
| | e. "K" values used for determining minimum sag lengths. | <input type="checkbox"/> | <input type="checkbox"/> | |
| | f. Vertical sight distance for crests. | <input type="checkbox"/> | <input type="checkbox"/> | |
| | g. Actual line & length of vertical sight distance at street intersections. | <input type="checkbox"/> | <input type="checkbox"/> | |

| EROSION CONTROL | | | | |
|------------------------|--|--------------------------|--------------------------|----------|
| PLAN SHEET TO INCLUDE: | | YES | NO | COMMENTS |
| 1. | Erosion control plan when disturbing over 10,000 sq. ft. within existing VDOT right-of-way. | <input type="checkbox"/> | <input type="checkbox"/> | |
| 2. | Location of temporary construction entrance(s) accessing state maintained right-of-way. | <input type="checkbox"/> | <input type="checkbox"/> | |
| 3. | Reference to the required establishment of a temporary vegetative cover on all denuded areas within right-of-way that are not to be fine graded for periods longer than 30 days. | <input type="checkbox"/> | <input type="checkbox"/> | |

HYDRAULICS

| | PLAN SHEET TO INCLUDE | YES | NO | COMMENTS |
|----|---|--|--|----------|
| 1. | Detailed drainage area map defining corresponding sub-areas used for computations showing centerline stationing at 100' intervals, intersections, PC's, PT's, etc., & the proposed storm sewer layout. | <input type="checkbox"/> | <input type="checkbox"/> | |
| 2. | Reference to the hydrologic methodology used including supporting data used in computation of "Q". a) The listed coefficients or "C" values. b) Computations of weighted coefficients "C _w ". | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | |
| 3. | Complete design computations per the following criteria: a) Culverts & closed storm sewer system design capacity for 10-year or 25-year & also capacity computation for 100-year. b) Cross-culverts computations showing sizes, end treatments, length, skewed angles, type of pipe, design cover, invert in & out elevations, outlet velocity. The pertinent calculated information incidental to the design of the culvert shall be tabulated on VDOT standard form LD-269, "Culvert Design Computation." c) Closed storm sewer system include size, velocity, capacity, actual design Q's, length & slope of the pipes, the invert in & out elevations. Pertinent calculated information incidental to the design of the pipeline shall be tabulated on VDOT standard form LD-229, "Storm Sewer Design Computations." d) Curb drop inlet spread shall determine the spacing of inlets for a rainfall intensity of 4.0 inches per hour. Include approach spread at sag inlets; spread lengths, depth of water, length on the inlet & height of the inlet slots. 100-year check storm for all sag inlets. e) Hydraulic grade lines or water surface profile include water surface elevations vs. rim elevations. The H.G.L. for storm sewer systems shall be tabulated on VDOT standard form LD-347 for 10-year & 100-year storms, when involved with a designated 100-year flood plain. f) Open channel computation for 2-year frequency is to be used for determining the need, type & dimensions of special ditch lining for erosion. 10-year frequency shall provide sufficient hydraulic capacity of the channel. Include MS-19 calculations for adequacy of existing channel, as stated in the <u>VA. Erosion & Sediment Control Handbook</u> . g) Include supporting computations for all special design structures such as special design endwalls, inlet, flumes, energy dissipaters, channels, etc. | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | |
| 4. | Detailed description of all proposed storm sewer structures. | <input type="checkbox"/> | <input type="checkbox"/> | |
| 5. | Graphic details for all non-standard drainage facilities. | <input type="checkbox"/> | <input type="checkbox"/> | |
| 6. | Directions of drainage flow for streets, storm sewer, valley gutters, subdrains, etc. | <input type="checkbox"/> | <input type="checkbox"/> | |
| 7. | Field location for all natural watercourses or drainageways affected by construction, including direction of flow. | <input type="checkbox"/> | <input type="checkbox"/> | |
| 8. | All existing storm drainage systems in plan & profile views. | <input type="checkbox"/> | <input type="checkbox"/> | |

PROJECT NAME _____

| HYDRAULICS (CONTINUED) | | | | | |
|-------------------------------|--|--|--|-----------------|--|
| PLAN SHEET TO INCLUDE | | YES | NO | COMMENTS | |
| 9. | Field located limits of 100-year flood zones & backwater inundation. | <input type="checkbox"/> | <input type="checkbox"/> | | |
| 10. | Existing and/or proposed VDOT drainage easements dimensional & labeled. | <input type="checkbox"/> | <input type="checkbox"/> | | |
| 11. | Driveway entrance culvert sizing computations for each lot. | <input type="checkbox"/> | <input type="checkbox"/> | | |
| 12. | Show all types of required underdrains with outlet locations clearly identified and defined. A. CD-1 required for fill to cut transition. B. CD-2 required for sag situations C. All CD's shall be connected to nearest outfalls. UD-4's may be required to make connection to nearest drop inlet. D. UD-4 or UD-5 required for all medians. E. UD-4 edge drains on roadways with design ADT of 1,000 vehicles per day or greater. F. EW-12 required for all outfalls to ditchlines. | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | | |

| UTILITIES | | | | | |
|-------------------------------|---|--------------------------|--------------------------|-----------------|--|
| PLAN SHEET TO INCLUDE: | | YES | NO | COMMENTS | |
| 1. | Alignment & dimensioned location of all existing utilities within limits of existing & proposed right-of-way. | <input type="checkbox"/> | <input type="checkbox"/> | | |
| 2. | Alignment & dimensioned location of all proposed utilities to be constructed within the limits of existing & proposed right-of-way. | <input type="checkbox"/> | <input type="checkbox"/> | | |
| 3. | Existing & proposed easements, width & use. | <input type="checkbox"/> | <input type="checkbox"/> | | |
| 4. | Details showing method of tie-ins within existing right-of-way. | <input type="checkbox"/> | <input type="checkbox"/> | | |
| 5. | Details showing required relocations within existing right-of-way. | <input type="checkbox"/> | <input type="checkbox"/> | | |

| PERMIT WORKZONE | | | | | |
|-------------------------------|--|--------------------------|--------------------------|-----------------|--|
| PLAN SHEET TO INCLUDE: | | YES | NO | COMMENTS | |
| 1. | Detailed work area protection layout, to include a construction sequencing/maintenance of traffic narrative for all construction activities within state maintained right-of-way.. | <input type="checkbox"/> | <input type="checkbox"/> | | |

Notes:

1. The developer is responsible for supplying sufficient information for the Department to determine entrance & road design features to adequately serve the existing roadway & the proposed development.
2. Subdivision plans shall be designed in accordance with VDOT's Subdivision Street Requirements and Road Design Manual.
3. All commercial entrances must meet VDOT standards & specifications as designated in Minimum Standards of Entrance To State Highway.
4. The submission is to include 2 copies of the plans for review. An additional copy of the plans is required once final approval is received.
5. A detailed explanation for all "no" answers if required information is not included in the site plan.

CERTIFICATION

I certify that the above stated information is included in the attached plans.

Engineer's Signature

Date



**CHESTERFIELD COUNTY
PLANNING DEPARTMENT
(804) 748-1050
<http://www.chesterfield.gov>**

**DEV. PLAN REVIEW
PUBLIC HEARINGS AUDIO/VISUAL AIDS**

If you plan to present graphic or audio material to the Commission or Board at a public hearing, it is suggested that the material be provided in a form that is easily viewed by those watching on television as well as at the meeting. We offer the following suggestions:

- If you plan to bring a videotape or Power Point presentation, contact Greg Allen at 748-1072 or David Hainley at 748-1967 in the Planning Department a few days prior to the public hearing to make arrangements.
- Prior to the beginning of the public hearing, advise a staff member that you will be presenting audio/visual information.
- Do not bring materials mounted on large boards
- Provide twenty (20) 8½ X 11 copies to the Administrative Secretary for distribution to individual members and to display on an opaque projector.
- Remember that typed information may be difficult to read, so make the font large and dark.
- 35mm slides should be mounted in a Kodak slide carousel. If you do not have a carousel, contact the Planning Department for assistance.

If you have any questions, please contact a staff member prior to the public hearing.

**TENTATIVE SUBDIVISION PLAT/SITE PLAN APPLICATION
TRAFFIC IMPACT ANALYSIS (TIA) COMPLIANCE FORM**

**COMPLIANCE WITH SECTION 15.2-2222.1 OF THE CODE OF VIRGINIA AND
CHAPTER 155 OF VIRGINIA ADMINISTRATIVE CODE**

Step 1. Complete the following.

This proposal is projected to have a daily trip generation of _____ vehicles per day and a site peak hour trip generation of _____ vehicles per hour, based on the stipulations of 24 VAC 30-155.

Step 2. Based on response above, choose one of the two alternatives below:

A. This proposal **DOES NOT MEET** any of the thresholds identified in the TIA Regulations Administrative Guidelines (24 VAC 30-155) that would require a VDOT/State 527 TIA to be submitted in conjunction with this application.

B. This proposal **MEETS** at least one of the thresholds identified in the TIA Regulations Administrative Guidelines (24 VAC 30-155) that would require a VDOT/State 527 TIA to be submitted in conjunction with this application. Three (3) copies of a VDOT/State 527 TIA, prepared in accordance with the TIA Regulations Administrative Guidelines (24 VAC 30-155), and the appropriate review fee are attached.

For assistance in completing this part of the compliance form, please contact the **Virginia Department of Transportation (VDOT) – Chesterfield Residency.**

Boris Solomonov, P.E., Land Use Manager

Phone (804) 674-2800

Fax (804) 674-2328

Email: Boris.Solomonov@vdot.virginia.gov

<http://www.virginiadot.org/projects/chapter527/>

Mailing/Street Address:

3301 Speeks Drive

Midlothian, VA 23112

I hereby certify that all the above statements are true.

_____ **Certifier's Name, Print and Sign**

_____ **Date**

_____ **Phone Number**

**STATE REGULATION (CHAPTER 527) TRAFFIC IMPACT ANALYSIS (TIA) THRESHOLDS
(TIA REQUIRED IF DEVELOPMENT MEETS OR EXCEEDS THE THRESHOLDS BELOW)**

| PROCESS | TYPE | THRESHOLD | REVIEW PROCESS | FEE STRUCTURE (FIRST & SECOND REVIEW – ONE FEE) CHECKS MADE PAYABLE TO: TREASURER OF VIRGINIA |
|--|--|--|---|--|
| REZONING | Residential | 100 Vehicle trips per Peak Hour (VPH) OR 200 Vehicle trips per Day (VPD) AND Doubles current traffic volume on a state maintained highway | VDOT may request a meeting with the applicant within 45 days upon receipt of TIA to discuss potential modifications to the TIA to address any concerns/deficiencies. VDOT review to be completed and written comments provided within: 45 days upon VDOT's receipt of TIA if no meeting scheduled/requested by VDOT. 120 days upon VDOT's receipt of TIA if meeting scheduled/requested/held by VDOT with the applicant. | \$500 (100 VPH or Less) \$1,000 (more than 100 VPH) |
| | Other Rezoning (Non-Residential) | 250 VPH OR 2,500 VPD | | |
| TENTATIVE SUBDIVISION PLAT | Residential | 100 VPH OR 200 VPD AND Doubles current traffic volume on a state maintained highway | VDOT may request a meeting with the applicant within 30 days upon receipt of TIA to discuss potential modifications to the TIA to address any concerns/deficiencies. VDOT review to be completed and written comments provided within: 30 days upon VDOT's receipt of TIA if no meeting scheduled/requested by VDOT. 90 days upon VDOT's receipt of TIA if meeting scheduled/requested/held by VDOT with the applicant. | For third or subsequent submissions, applicant shall pay additional fee as though the third or subsequent submission were an initial submission. |
| SITE PLAN | Other Development (Non-Residential) | 250 VPH OR 2,500 VPD | TIA CONDITIONS PER VDOT CHAPTER 527 (VDOT TO MAKE DETERMINATION): 1. Previously submitted TIA assumptions remain valid and less than 2 years elapsed since Locality approval of rezoning – Provide supplemental TIA letter to VDOT. 2. Previously submitted TIA remains valid and more than 2 years elapsed since Locality approval of rezoning – Provide supplemental TIA letter to VDOT. 3. Previously submitted TIA assumptions have materially changed such that adverse impacts to state-controlled highways have increased. | |
| * PROPOSALS GENERATING LESS THAN 1,000 VEHICLES PER PEAK HOUR, THE APPLICANT MAY REQUEST A SCOPE OF WORK MEETING WITH VDOT. WHEN GENERATING MORE THAN 1,000 VPH, A SCOPE OF WORK MEETING IS REQUIRED WITH VDOT. | | | | |
| VDOT CHESTERFIELD RESIDENCY POINT OF CONTACT: Boris Solomonov, P.E., Land Use Manager 3301 Speaks Drive Midlothian, VA 23112 (804) 674-2800 Boris.Solomonov@vdot.virginia.gov | | | | |

**Chesterfield County Department of Environmental Engineering
Land Disturbance Application Procedures
9800 Government Center Parkway**

These steps must be completed prior to any land clearing activity. **Permit Application Processing is not a “walk-through” process.** If you should have any questions regarding these procedures, please contact Carole Cliborne at 748-1035.

Submit a Program Administration Fee, as appropriate, with initial plan submission (review fee)

- \$100.00 for less than 10,000 square feet of disturbed land.
- \$1360.00 for 10,000.00 square feet or greater of disturbed land; plus an additional \$60.00 per disturbed acre, commercial.
- \$1360.00 plus \$60.00 per single-family residential lot per section.
- No fee for Enterprise Zone projects
- \$1000.00 for projects that have previously been approved.
- No fees or bonds are required for minor site plans.

For all non-individual single-family residential property greater than 10,000 square feet and projects requiring site plan review processing (all of the above classes of projects), the following must be accomplished prior to permit application:

- Approval of Site Plans/Subdivision Construction Plans
- All Site Plans require an approval letter from the Planning Department.

Commercial/site plan approval status may be seen at:
<http://www.chesterfield.gov/planreview/default.asp>

Subsequent to plan approval and **PRIOR** to application, submit additional copies of plans as indicated:

For subdivisions, submit two (2) extra copies of plans to be stamped approved “**Approved for Construction**” by Environmental Engineering.

For commercial sites, submit three (3) extra copies of plans to be stamped approved by the review engineer.

Once plans are stamped approved, a copy of the plans should be delivered to the erosion control contractor and the owner **PRIOR TO PERMIT APPLICATION**. The third commercial site plan copy will remain with the Department of Environmental Engineering.

- Submit a check, letter of credit or a bond as surety for the erosion control measures. Bonding companies **must have a minimum A. M. Best® rating of financial strength A and financial size VII**. An itemized cost estimate to establish the amount of the surety must be submitted in advance by the project engineer and approved by the ENVIRONMENTAL ENGINEERING review engineer. Proper format/verbiage for the bond or letter of credit can be found at the website:

[Environmental Engineering Documents and Forms](#)

- Persons signing the bond must have the proper authority to do so per the following guidelines:

| Corporation | Church | LLC | Partnership |
|----------------|---------|---------------|---------------------|
| President | Trustee | any member or | any general partner |
| Vice President | | Manager | |
| Assistant VP | | | |

- If any work is proposed to connect with an existing State maintained road, submit a copy of the issued VDOT Land Use Permit.

- Submit a copy of the VSMP application and fee paid receipt (obtain from Commonwealth of Virginia Department of Conservation and Recreation, (DCR) which can be located at the website:

http://www.dcr.virginia.gov/soil_&_water/vsmp.shtml

- Wetlands Documentation from the U. S. Army Corps of Engineers and/or The Virginia Department of Environmental Quality must be provided.

- Submit a Land Disturbance Permit Application. **The Certified Responsible Land Disturber (CRLD)** must be specified and must sign the application in the appropriate blank and provide his Certification Number and the expiration of certification. In addition, the **CRLD must supply a designated email address, which will be utilized by the Environmental Engineering Inspector for erosion control/compliance correspondence on this project. Email should be checked each business day for communications pertaining to this project.**

Out of state owner, partnership or corporation must have a legally appointed resident of Virginia to accept Service of Process. Appointment of agent for service form also available at the website

[Environmental Engineering Documents and Forms](#)

- To be considered complete, the Land Disturbance Permit Application **must** include valid email addresses for the Applicant, the Contractor of record, and the Certified Responsible Land Disturber. Applications not having this, or any other required information, will be delayed until complete.

- Land Disturbance Permit applications must have original signatures.**

Once the application has been processed, you may contact the Environmental Engineering Inspector to schedule an on site pre-construction meeting. There is a 48-hour notification requirement for this meeting.

After a successful onsite pre construction meeting, the Inspector will issue a Land Disturbance Permit to be posted at the site.

DUE TO THE UNIQUE NATURE OF EACH PROJECT ADDITIONAL REQUIREMENTS MAY APPLY PER THE REVIEW ENGINEER OR PROGRAM ADMINISTRATOR.

Last revision: 10/22/2010

CHESTERFIELD COUNTY LAND DISTURBANCE PERMIT APPLICATION

OWNER/DEVELOPER SECTION

I, _____, hereby certify this _____ day of _____, 20____ that:

1. An Erosion and Sediment Control Plan ("Plan") has been submitted with the site or subdivision plan to the Chesterfield County Environmental Engineer as required by the Chesterfield County Erosion and Sediment Control Ordinance.

2. I am the owner of the following described property; and am solely responsible for carrying out the Plan.

- a. Subdivision/Project Name: _____
- b. Location: _____
(address/road frontage and
distance to intersection) _____
- c. Parcel Identification Number: _____
- d. Magisterial District: _____
- e. Intersection road Name and
State Route Number _____ SR# _____

3. I shall be responsible for the proper performance and maintenance of the Minimum Standards (1-19) along with the erosion and sediment control measures included in the plan.

4. I shall conform to the provision of Article 4, Chapter 5 of Title 10.1 of the Code of Virginia, 1950, as amended and the Chesterfield County Erosion and Sediment Control Ordinance.

5. I, _____, (signature) hereby grant the Environmental Engineer of Chesterfield County or his designated agents the right to enter my property, subject to the Land Disturbance Permit herein applied for, to inspect or monitor for compliance with the provisions of the permit on the above referenced project.

6. In the event that measures for the control of siltation and/or erosion as provided for in the "Plan", or in any approved modification thereof are not constructed and siltation and erosion results, or are constructed, but fail (through overload and/or inadequate maintenance) to perform the function for which they are intended, the Environmental Engineer of the County of Chesterfield or his designated agent shall have the right to enter upon the property subject to such plan and shall be entitled to take such measures or to do other work as deemed necessary to prevent further siltation or erosion provided that the County shall first give notice in writing to me or my designated agent for the County's intent to do so.

7. In any event there occurs siltation and/or erosion from the property covered by the Land Disturbance Permit in sufficient quantity to adversely affect downstream properties the Environmental Engineer may hold the below signed responsible for satisfactory restoration.

8. It is the purpose or intent of this document to insure installation, maintenance, and performance of measures provided for in the approved Erosion and Sediment Control Plan or approved modification thereof.

9. I certify that _____ (contractor) has in his possession, a copy stamped "APPROVED FOR CONSTRUCTION - ENVIRONMENTAL ENGINEERING" on the Plan dated _____ with revisions dated _____ for _____ (project).

10. I certify that I fully understand the provisions of the Chesterfield County Erosion and Sediment Control Ordinance and agree to carry out the approved Erosion and Sediment Control Plan on the above referenced project.

11. I certify that there is an appropriate contractual agreement between (*required information):

*Contractor Name: _____

*Contractor Address: _____
*(street and mailing) _____

*Contractor Phone Number: _____

*Contractor E-Mail Address: _____

and myself which establishes _____ (Full name of Certified Responsible Land Disturber [CRLD]) as the person responsible for carrying out the erosion and sediment control plan and/or providing erosion and sediment control facility maintenance and/or dust control when requested by the County or as specified in the narrative. The signature of the above identified CRLD, below, certifies his acknowledgement of his responsibilities (* required information):

*Signature of CRLD Identified Above

_____/_____
*Certification Number *Expiration Date

*CRLD Address: _____
*(street and mailing) _____

*CRLD Telephone: _____

*CRLD E-Mail Address: _____

12. I certify that all other contractors who engage in land disturbance activity on my behalf will comply with the provisions of the Chesterfield County Erosion and Sediment Control Ordinance and Plan, including, but not limited to, not engaging in such activity without the existence of a Land Disturbance Permit nor without the designation of a CRLD for such activity.

13. I will authorize commencement of land disturbance activities on the project only when a VDOT Land Use Permit has been issued, if applicable, and there is a valid Land Disturbance Permit displayed on the site.

14. I fully understand that I am subject to prosecution in the General District Court of Chesterfield County when any contractors who engage in land disturbance on my behalf commence or continue to engage in land disturbance without the existence of the Land Disturbance Permit.

15. I understand that failure to comply with the Erosion and Sediment Control Plan or any other violation of the Chesterfield County Erosion and Sediment Control Ordinance shall be cause for revocation of the Land Disturbance Permit.

16. I, or _____ (contractor), will notify the Chesterfield County Environmental Engineering Department Inspector at least 48 hours in advance of the date of a requested pre-construction conference meeting.

17. When a pre-construction meeting has been determined to be necessary by the County, that meeting shall have been satisfactorily concluded prior to issuance of the Land Disturbance Permit.

18. To the best of my knowledge all applicable wetlands permits required by Federal, State, or local laws have been received.

19. I understand that providing E-Mail addresses for my contractor, the site CRLD, and myself is required and provides the county with a means to rapidly communicate field notifications. I understand that it is imperative that the addresses provided be accurate and that the email accounts be monitored on a daily basis. I understand that I am responsible for the timely response by all of the parties identified in this application individually acknowledging receipt of any such field notifications. I understand that a failure to acknowledge receipt of a field notification within 24 hours of transmission by an agent of the county, or the receipt by the county of a delivery failure notice for such a field notification, for any party identified herein could constitute grounds for permit revocation. I understand that any electronically transmitted field notification meets the intent for delivery purposes of a Notice to Comply or Notice of Violation as set forth in Chapter 8 of the Code of Chesterfield, sections 8-15 and 8-17.

(*Required information)

*OWNER'S NAME: (Please Print) _____

*SIGNATURE: _____

*TITLE: _____

OFFICER/OWNER/AGENT

*ADDRESS: _____
*(Street & Mailing)

*TELEPHONE: _____ *FAX: _____

*E-MAIL ADDRESS: _____

STATE OF _____

CITY/COUNTY OF _____, to wit:

I, _____, a Notary Public in and for the County and State aforesaid, do hereby certify that _____, whose name is signed to the foregoing and annexed writing bearing date on the ____ day of _____, 20____, has acknowledged the same before me in my jurisdiction aforesaid.

Given under my hand this ____ day of _____, 20____.

My commission expires: _____

Notary Public