ROUTE 199

JAMES CITY AND YORK COUNTIES

Final
Environmental Impact Statement

prepared for

Federal Highway Administration
U.S. Department of Transportation
and
Virginia Department of Transportation

State Project 0199-047-102
and 0199-047-103

Federal Project F-126-1(101)

Virginia Coastal Zone Management Program

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ADMINISTRATIVE ACTION

Final Environmental Impact Statement

U.S. Department of Transportation
Federal Highway Administration

and

Virginia Department of Transportation

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State Project Numbers 0199-047-102 and 0199-047-103
Federal Aid Project Number F-126-1(101)

Route 199 from Route 5 in James City County to Interstate 64 in York County.

The proposed access consists of extending Route 199 from Route 5 northward to Interstate 64 as a four-lane divided access controlled facility.

Submitted pursuant to 42 U.S.C. 4332(2)(C) and 23 U.S.C. 128

This action complies with Executive Order 11988, Floodplain Management and Executive Order 11990, Protection of Wetlands.

Cooperating Agencies:

Virginia Marine Resources Commission

Department of the Army Corps of Engineers

U.S. Department of Interior, Fish and Wildlife Service

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SUMMARY

S-1. ACTION

Federal Highway Administration Administrative Action Environmental Statement.

( ) Draft
(X) Final
( ) Section 4(f) Statement

S-2. PERSONS TO CONTACT FOR ADDITIONAL INFORMATION

Mr. Robert L. Hundley, Environmental Quality Engineer, Environmental Quality Division, Virginia Department of Transportation (VDOT), 1401 East Broad Street, Room 1114 Annex, Richmond, Virginia 23219, (804) 786-4304.

Mr. James M. Tumlin, Division Administrator, Federal Highway Administration, 400 North Eighth Street, P. O. Box 10045, Richmond, Virginia 23240, (804) 771-2371.

S-3. PROJECT DESCRIPTION

The Virginia Department of Transportation (VDOT) in cooperation with the Federal Highway Administration is proposing the construction of a four-lane, divided, controlled access highway within the counties of James City and York, Virginia. Designed to supplement the existing highway system, this proposal will add traffic carrying capacity to the existing highway system and will safely accommodate high-speed traffic movement in the area. Further, it will better tie together the existing road network and improve access into the project area.

The proposed southern project terminus is in the vicinity of the intersection of completed Route 199 and Route 5 in James City County. The proposed

northeastern project terminus is in the vicinity of the existing I-64 interchange with Route 646.

Each alignment alternative provides access at Routes 5, 615, 612, 60, 646 and I-64. The proposed project will connect via interchanges at Route 60 and I-64. The remainder of the access points will initially be at-grade; however, sufficient right-of-way will be acquired to accommodate the construction of the interchanges when traffic demand warrants it. Initially an interchange at I-64 and Route 60 will be built and ultimately interchanges at Routes 615, 612, 646 and 658 will be added. A minimum right-of-way width of 200 feet will be required. Construction of this approximately seven and one-half mile project will be primarily on new location. Total project costs provided by the VDOT for the selected alternative are estimated at $27,000,000.

The proposed project is included in the transportation plans of the Peninsula Metropolitan Planning Organization, Peninsula Planning District Commission, York County, and James City County, as well as the City of Williamsburg. This facility is projected to carry from 12,000 to 21,000 vehicles per day in 2010 on various segments of the build alignments.

Terrain throughout the proposed project corridor is rolling, and the study area is traversed by numerous drainage areas. Land use found in the study area varies from natural ecosystems such as forests to manmade developments such as residential and commercial retail areas. Forested land predominates in the area traversed by the proposed project. Other land uses found in the project area include agricultural, commercial, and public/semipublic.

S-4. PERMITS REQUIRED

A U.S. Department of Army, Corps of Engineers Permit will be required to perform work in or affecting navigable waters of the United States pursuant to Section 10 of the Rivers and Harbors Act and to discharge dredged or fill material into waters of the United States pursuant to Section 404 of the Clean Water Act.

A joint application process will be administered through the Commonwealth of Virginia Marine Resources Commission (VMRC). The application involves the U.S. Department of the Army, Corps of Engineers (COE), the Commonwealth of Virginia, and local boards and agencies concerned with performing work in the waters and wetlands of Virginia.

The Department will apply for all necessary permits from the Virginia State Water Control Board, Virginia Marine Resources Commission and the Department of the Army, Corps of Engineers. Prior to the selection of Revised Line A as the preferred alignment, a biological assessment in response to Section 7 of the Endangered Species Act of 1973 was conducted. Also, a Farmland Conversion Impact Rating has been obtained from the U.S. Soil Conservation Service (SCS).

S-5. ALTERNATIVES STUDIED AND THE SELECTED ALTERNATIVE, REVISED LINE A

To meet the objectives developed during transportation planning for the area, a number of alternatives were developed and considered. Seven alternatives, six build alignments and a mass transit alternate, were dropped from further consideration due to public water supply encroachment, or lack of cost effectiveness. Another reason for eliminating these alternatives was the need for a new interchange with I-64.

Three alternative concepts for Alignments A, D and A-2 were studied in the Draft Environmental Impact Statement. A comparision of these alignments shows that Lines A or the A/A-2 combination have less overall environmental impact and construction cost than Alignment D. However, during the environmental analysis, a colony of small whorled pogonias (Isotria Medeoloides), a federally and state endangered plant species was discovered within 100 feet of Line A. Line A would also take two individual plants from a smaller colony of small-whorled pogonia.

When the endangered plant was discovered, VDOT began close coordination with Dr. Donna Ware of the College of William and Mary and the Department

of Agriculture and Consumer Service, the State Agency responsible for administering the Virginia Endangered Plant and Insect Species Act. Line A-1 was then established to avoid the endangered plant.

After receiving input from the public information meeting and hearing held on April 3, 1986, VDOT continued coordinating with Dr. Ware and the Department of Agriculture and Consumer Services and made an additional adjustment to Line A, herein referred to and identified as Revised Line A (see Figure S-1).

Prior to the selection of an alignment on Section 7 Biological Assessment was performed. This assessment indicated that the Revised Line A minimized the impact to the small-whorled pogonia and reduced the project construction costs of Line A-1 by $1,533,500. This alignment was recommended by VDOT and a Section 7 Biological Assessment of Isotria Medeoloides was administered by the Department. Subsequently, the U. S. Fish and Wildlife Service and the Department of Agriculture and Consumer Services have reviewed the proposed alignment and support the Department's recommendation for the construction of Revised Line A.

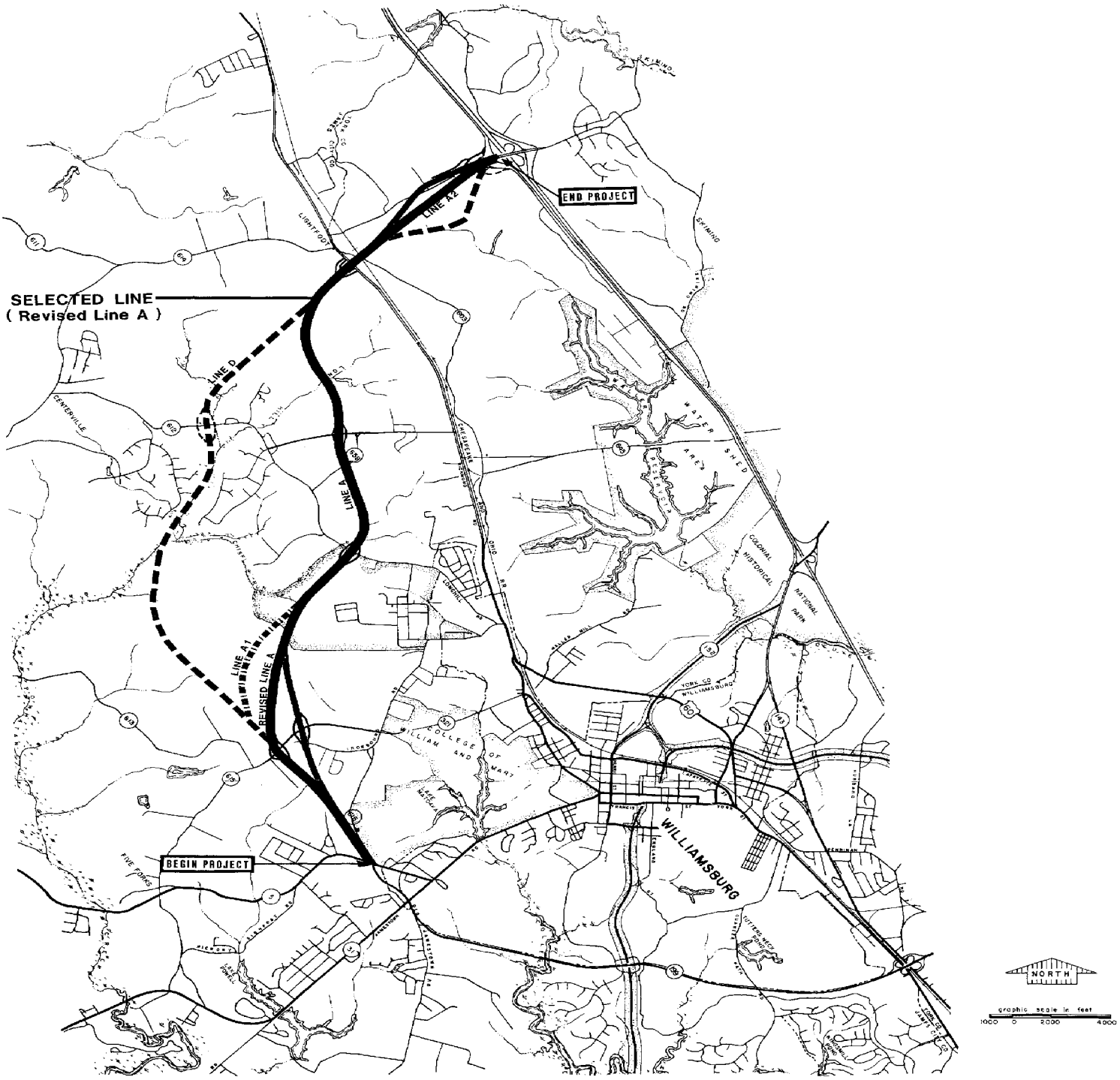
The Revised Line A has been selected as the alternative for Route 199. The location of Revised Line A, the selected alignment, is the same as the location of Line A except in the vicinity of the endangered plant species. Revised Line A begins at Line D north of the Route 615 interchange. It moves northwest and curves north and northeast joining Line A approximately 4,800 feet north of Route 615. Overall the environmental impacts in the areas of noise, cultural resources, disturbed forest area and floodplain encroachments are less than for other alternatives. The costs and right-of-way required for the selected alternative, Revised Line A, are moderate in comparison to estimates for other alternatives studied. The selection of the Revised Line A alternative was based on the recommendation resulting from the Section 7 Biological Assessment of Isotria Medeoloides. This alternative minimizes costs while retaining existing colonies of the endangered species as well as allows the use of an alternative which incurs fewer environmental impacts as shown on Table S-1. Figure S-1 shows the summary of impacts for the Revised Line A, the

FIGURE S-1

SELECTED ALIGNMENT

ROUTE 199 CORRIDOR

JAMES CITY AND YORK COUNTIES
VIRGINIA



selected alternative and the other proposed alignments discussed in this Environmental Impact Statement.

S-6. SUMMARY OF IMPACTS

A summary of the impacts is included in Table S-1. This table compares the various alignments considered and discussed in the environmental impact statement. Revised Line A avoids impacts to the small-whorled pogonias as discussed in the Section 7-Biological Assessment (see Appendix D). Based upon this and other information regarding the various alignments, VDOT has concluded that the selection of Revised Line A is the preferred alternative for the proposed Route 199 corridor.

S-7. BENEFICIAL EFFECTS

Construction of the proposed project will have the following beneficial effects:

a. It will provide increased traffic carrying capacity to the existing highway system.

b. It will tie together the existing road system, making it more functional.

c. It will facilitate the movement of emergency and rescue equipment.

d. It will improve access to several schools.

e. It will help implement the transportation planning goals of James City County, York County, the Metropolitan Planning Organization, and the Peninsula Planning District Commission which will reduce through traffic and congestion in Williamsburg and its pedestrian oriented areas of Colonial Williamsburg (a major tourist attraction) and the College of William and Mary.

Table S-1
Summary Comparison of Impacts for Build Alternatives

Impact	Alternative: Selected Alternative/ Revised A	A	D	A-1	A-2	No Build
Displacements						
Families	13*	11	9	14	7	0
Businesses	0	1	0	0	1	0
Other	0	0	0	1	1	0
Loss of Real Estate Tax Revenue	$ 13,900	$ 15,000	$ 11,500	$ 16,900	$ 13,700	0
Right-of-Way Costs	$ 3,573,000	$ 3,784,000	$ 3,139,000	$ 4,153,500	$ 3,513,000	0
Construction Costs	$23,427,000	$23,149,000	$25,148,000	$24,380,000	$23,297,000	0
TOTAL COSTS	$27,000,000	$26,933,000	$28,287,000	$28,533,500	$26,810,000	
Noise Receptors Violations FHWA Standards	7	8	10	-	-	3
Archaeological Sites Impacted	7	19	17	19	19	0
Historical Sites Impacted	0	0	0	0	0	0
Upland Forest Area Taken (acres)	146.8	146.8	164.5	149.5	146.8	0
Bottomland Forest Area/ Wetlands Taken (acres)	12.2**	10.6	22.3	8.9	10.6	0
Farmland Encroachment (acres)	28.0	22.0	27.0	22.0	26.0	0
Floodplain Encroachment (Direct and Longitudinal-Acres)	10.6	10.6	22.3	8.9	10.6	0
Right-of-Way (acres)	250.6	250.6	246.5	264.3	270	0
Miles of Deficient Roadway	14.26	14.26	13.48	14.26	14.26	21.96

Note: There is not a significant impact on air quality as a result of construction of any of the alternatives.

Data for Revised Line A is based on Virginia Department of Transportation information of November 1986.
* VDOT, August 1988.
** WAPORA, Inc. August 1988.
(Source: Virginia Department of Transportation, Harland Bartholomew & Associates, January 1986 and June 1987).

f. It will allow vehicles that originate or have destinations to the west, northwest, and southwest of Williamsburg to bypass the central areas and avoid congesting the business, institutional and tourist areas.

g. It will reduce traffic volumes in the design year on Route 60.

h. It will complement and facilitate planned land use development in James City County.

i. It will provide better access to future development on the Warhill Tract and to tourist support facilities located along Route 60.

j. It will provide better access to the growing residential area of James City County west of Williamsburg.

k. A significant reduction in energy consumption will result from each of the build alternatives.

S-8. ADVERSE EFFECTS

Construction of the proposed project will have the following adverse effects:

a. It will result in the displacement and relocation of 13 families.

b. It will convert approximately 146.8 acres of undeveloped forest land, 28 acres of agricultural land and 12.2 acres of wetlands (predominately from Mill Creek, Chisel Run, Long Hill Swamp and Powhatan Creek tributaries) to highway right-of-way, depending upon the build alternative selected.

c. The project will cost approximately $27,000,000.

d. Phase II archaeological studies indicate that one historic site and five prehistoric sites require Phase III investigation prior to construction.

Additionally, another prehistoric site can be mitigated by avoiding it during construction.

e. The Section 7 coordination and biological assessment studied the impacts of the selected alternative, Revised Line A, on a colony of small-whorled pogonias (Isotria medeoloides), a federally listed endangered plant species. After this study, the Virginia Department of Transportation selected Revised Line A to avoid a direct take of any plants and to miss the main colony by approximately 1,100 feet. A complete description of planned mitigation measures and concurring statements for the selected alignment and the mitigation plan by the U.S. Fish and Wildlife Service and the Virginia Department of Agriculture and Consumer Services are included in Appendix D.

1.0 PROJECT DESCRIPTION

The proposed project is located in the vicinity of the City of Williamsburg, which lies in east-central Virginia on a peninsula of land surrounded by the James River, York River, and Chesapeake Bay. The Regional Location and Project Location Maps are shown in Figures 1-1 and 1-2 respectively.

The Virginia Department of Transportation (VDOT), in conjunction with the Federal Highway Administration (FHWA), is proposing to extend Route 199 from Route 5 to I-64. Construction of this segment of Route 199 will form a circumferential system which will serve as 1) a collector for internal traffic in Williamsburg, 2) a bypass for through traffic around Williamsburg, 3) a link which will tie together the existing road systems, and 4) access into the mid-James City County area.

This study evaluates the impacts of the completion of Route 199 on traffic, engineering, and environmental factors within the project corridor. The proposed Route 199 is a controlled access, 4-lane divided highway beginning at the intersection of the previously completed Route 199 and Route 5 and continuing northward to its terminus at the interchange of I-64 and Route 646. The existing interchange at I-64 will tie in with the proposed Route 199. An interchange will be built at Route 60 and ultimately interchanges at Routes 615, 612, 658 and 646 will be added. Alignment A, which is approximately 7.4 miles in length, and Alignment D, which is 8.1 miles long, are the two main alternative alignments studied for Route 199. A colony of small-whorled pogonias (Isotria medeoloides), an endangered plant species, was discovered at the southern project terminus. As a result, Alignment A-1 and Revised Line A were added as alternatives to the southern portion of Alignment A. These alignments follow Alignment D for approximately 0.75 mile and proceeds northeast for 1.1 miles until it ties into Alignment A at Chisel Run. Alignment A-2 was added in between Alternatives A and D at the north end of the project, running for approximately 1.3 miles from Route 60 to I-64. The purpose of this alternative is to improve access conditions in the vicinity of the Williamsburg Pottery Factory/Route 646.

The No Build Alternative, which studies the effects if the road is not constructed, is also considered. Each of the alternatives for the proposed Route 199 are evaluated to assess the potential impacts of implementation and to determine mitigation measures to avoid or lessen the adverse effects. Alignment alternatives are illustrated in Figure 1-3 and the selected alternative, Revised Line A, is discussed in the Summary Section S-5 and Section 3.3 of this document.

FIGURE 1-1

REGIONAL LOCATION MAP

ROUTE 199 CORRIDOR

JAMES CITY AND YORK COUNTIES
VIRGINIA

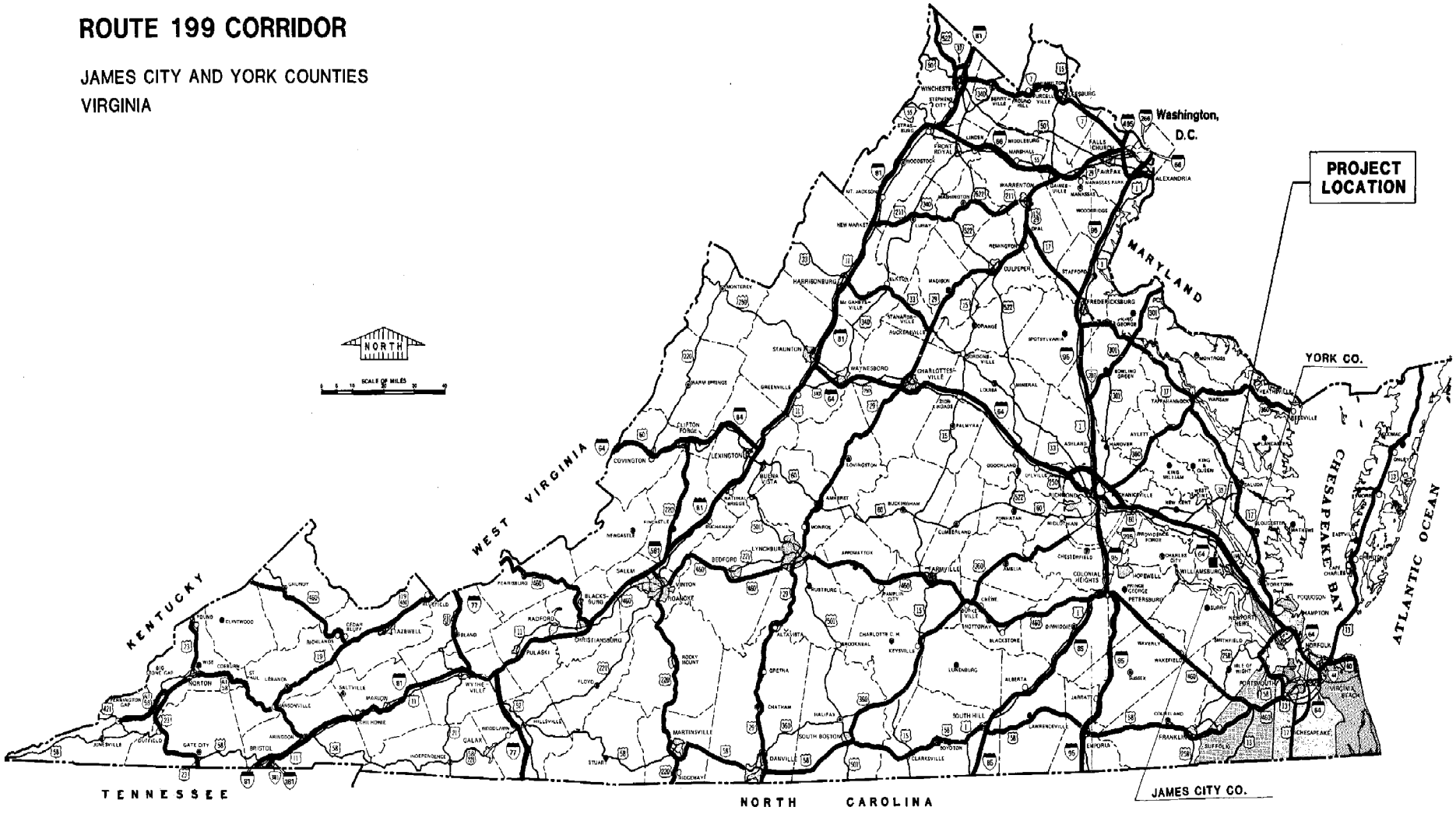


FIGURE 1-2

PROJECT LOCATION MAP
ROUTE 199 CORRIDOR AND ENVIRONS

JAMES CITY AND YORK COUNTIES
VIRGINIA

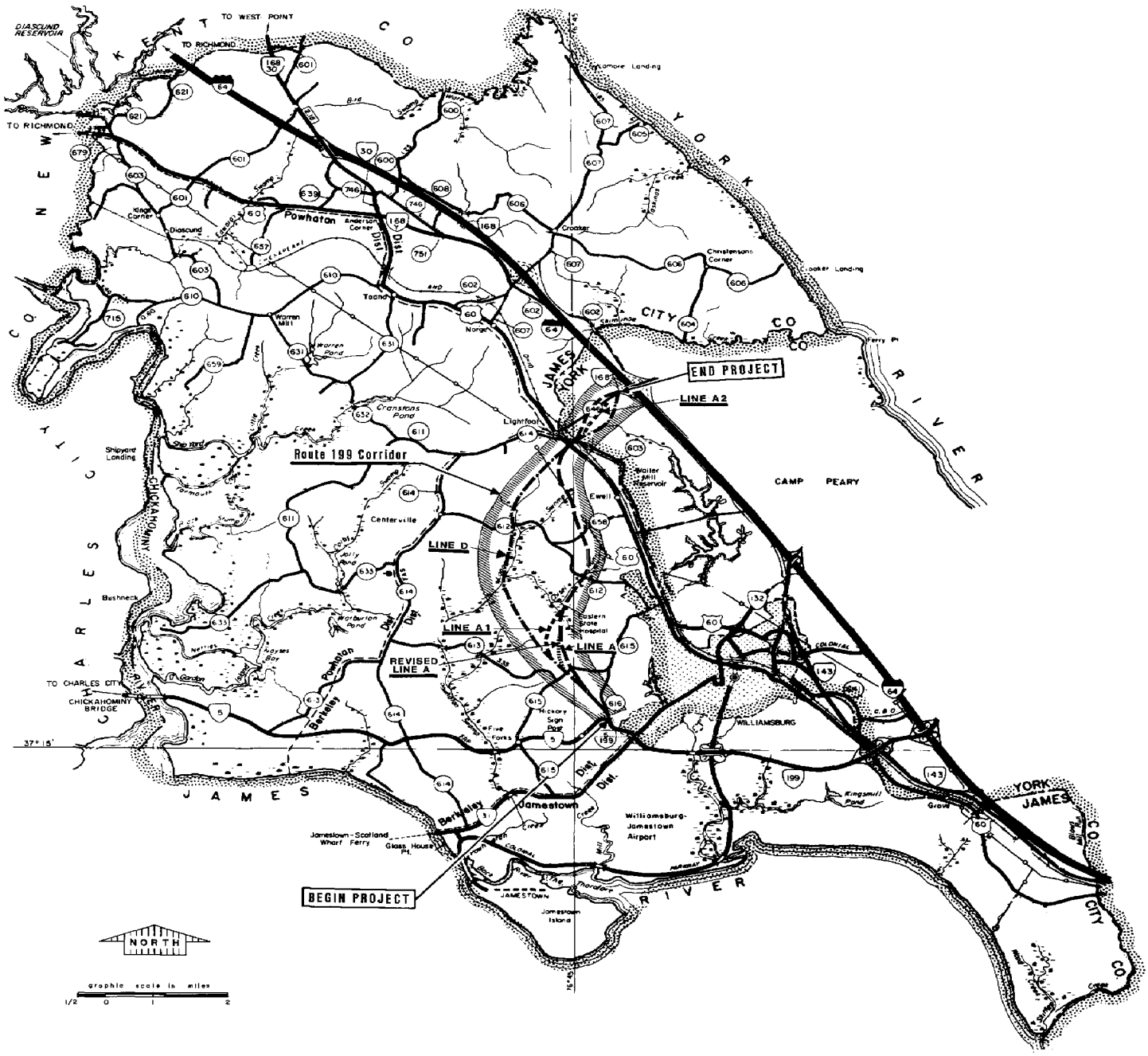
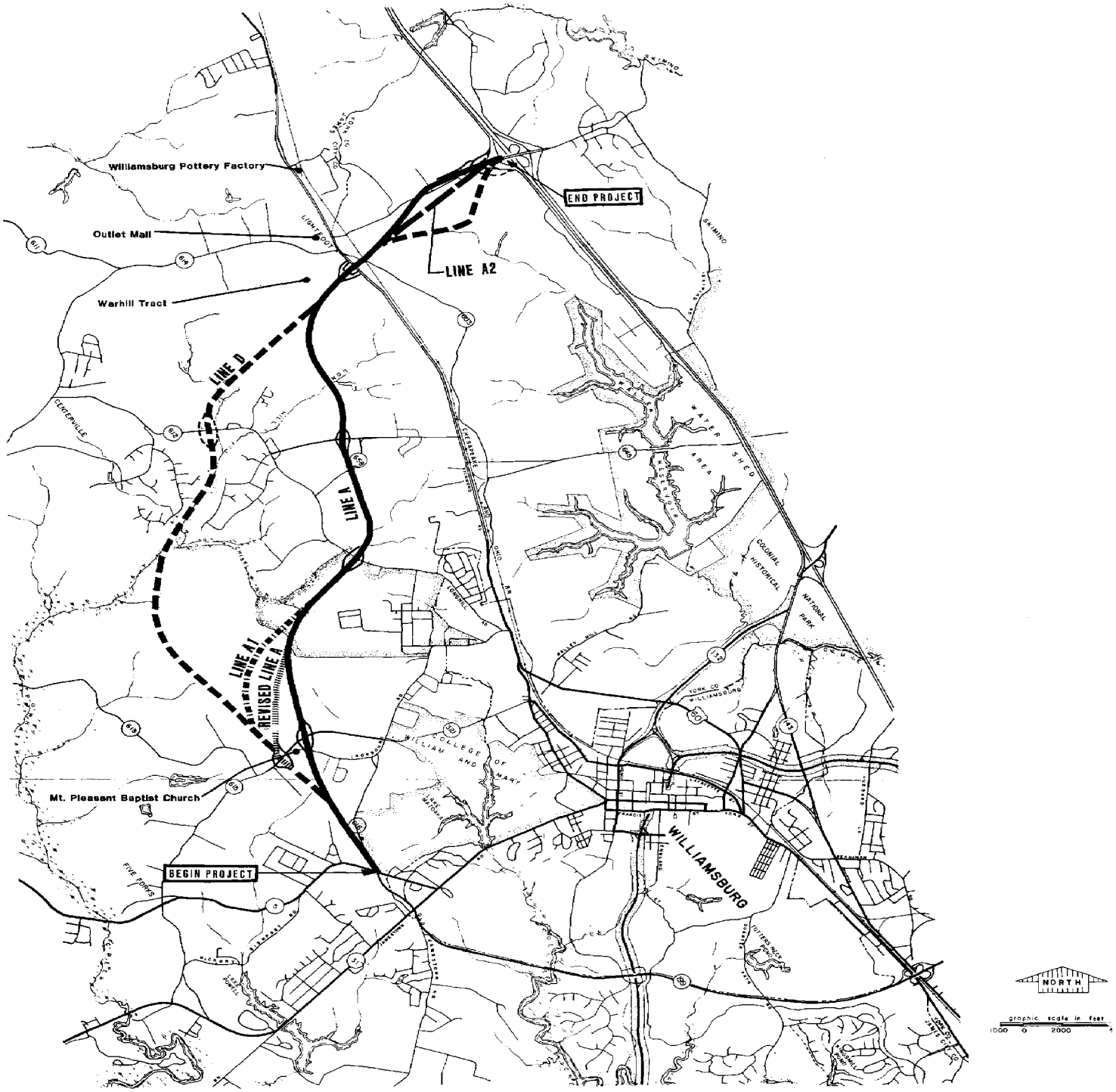


FIGURE 1-3

ALIGNMENT ALTERNATIVES
ROUTE 199 CORRIDOR

JAMES CITY AND YORK COUNTIES
VIRGINIA



2.0 PURPOSE AND NEED

2.1 PLANNING BASIS FOR THE PROPOSED ACTION

The Federal Aid Highway Act of 1962 requires an ongoing transportation planning process in urbanized areas in order to receive federal funds for transportation improvements. Pursuant to this act, the Peninsula Area Transportation Study (PATS) was developed. This study is periodically reevaluated to determine future traffic demands in the area and to outline improvements that will satisfy those demands. The most recent PATS reevaluation indicates the need to extend Route 199 northward from the Route 5 to I-64. A 4-lane divided facility was recommended. The proposed action for the construction of Revised Line A is presented in this document and is consistent with the adopted transportation plan.

James City County considers the proposed project the top highway project in the County. The proposed project is included in the County's 1981 Comprehensive Plan. Further, the James City County Board of Supervisors passed a resolution on June 28, 1976, urging VDOT to accelerate completion of Route 199. Another resolution was passed by James City County on March 13, 1978, asking VDOT to make a final corridor selection and begin design and construction of the Route 199 extension as soon as possible.

York County's transportation plan includes the Route 199 concept. York County officials consider the proposed project important to their development plans in the study area.

The City of Williamsburg has included the proposed Route 199 concept in the 1981 Williamsburg Comprehensive Plan and their Transportation Plan. On June 21, 1977, the Williamsburg City Council passed a resolution urging VDOT to extend Route 199 to I-64. Williamsburg considers the project important to the City because it will relieve existing and future traffic congestion.

Others who have expressed their desire to see the extension of Route 199 include the Williamsburg-James City County Chamber of Commerce, the Colonial Williamsburg Foundation, Anheuser Busch, and the Williamsburg Board of Realtors.

2.2 EXISTING ROADWAY NETWORK

Williamsburg, Virginia is situated between two major metropolitan areas: Richmond (to the north) and Hampton/Newport News (to the south). There are several major north-south highways which serve the Williamsburg area. I-64, which passes just east of Williamsburg, is a 4 to 6-lane limited access facility, extending the entire length of the Peninsula from Hampton/Newport News north through the Richmond area. Another north-south highway is Route 60 (Richmond Road), which also extends the entire length of the Peninsula and passes directly through the City of Williamsburg. Route 60 is currently a 4- to 5-lane major arterial traversing the developed portions of the study area. One other major north-south oriented highway is Route 143. A 4-lane facility with development along both sides, Route 143 originates in the Hampton/Newport News area, parallels I-64 northward up the Peninsula, passes through the City of Williamsburg, and terminates northeast of Williamsburg at I-64.

There are also a number of routes which radiate out from Williamsburg and serve to connect Williamsburg with I-64 and the adjoining areas. These include Route 132, Route 5, Route 31, Route 616, Route 615, Route 612, Route 603, and Route 199. Route 132 is a 4-lane facility that serves as a major link between I-64 and Colonial Williamsburg (a major tourist attraction in the Williamsburg area). Route 31 and Route 5 and the other routes mentioned extend out from Williamsburg to the west. Each of these facilities is a roadway through major development areas; Route 31 being 4 lanes, while Route 5 is 2 to 4 lanes. All other routes are 2-lane rural roadways. Route 199 is a circumferential route around a portion of Williamsburg with interchanges at I-64, Route 143, Route 60, and the Colonial Parkway. It presently terminates at an at-grade intersection with Route 5 on the west side of the city. Route 199 is a 2 to 4-lane limited access facility with sparse development on either side. It now serves as a major connection between

Route 132, Route 5, and Route 31 and the area generally west of Williamsburg. These routes are shown on Figure 1-2.

The proposed project will provide a connection between all these roads and I-64 north of Williamsburg and the already completed section of Route 199 south of Williamsburg. This will provide for improved traffic circulation in the study area. As a western bypass, it will reduce some of the through traffic in Williamsburg and allow it to bypass the congested area.

2.3 EXISTING TRAFFIC

The study area's central location in the Peninsula and its tourist attractions, combined with the presence of I-64 and Route 60, result in a large number of persons traveling through the area. In 1984, the average daily traffic (ADT) on Route I-64 was 28,000 vehicles and approximately 17,000 vehicles on Route 60. By 2010, without the construction of the proposed project, I-64 will be carrying an ADT of 37,000 vehicles and Route 60 will carry an average of 28,500 vehicles with a range of 25,000 to 31,800 vehicles per day, depending on the segment. Projected ADT in 2010 on Route 199 varies from 12,000 vehicles to 21,000 vehicles depending on the segment and alternative.

Levels of service (LOS) indicate the degree of congestion on a particular roadway: LOS A being the best, LOS F describing a forced flow (jammed) condition, and LOS C usually considered acceptable. In 1984, peak hour LOS on Route 60 ranged from B to F, depending on location. Overall, the street system is operating at acceptable levels; however, the low LOS at several locations indicates some existing operational problems. Improvements at the intersections of Route 60 with Route 658 and Ironbound Road would result in acceptable levels on this roadway for the time being. In addition, improvements are needed at the Richmond Road/Jamestown Road/Boundary Street and Richmond Road/Lafayette Street/Monticello Avenue intersections; they are both presently operating at unacceptable LOS and need upgrading in order to function efficiently.

2.4 FUTURE DEVELOPMENT

Development in the project area is occurring as an expanding crescent around Williamsburg with concentrations in the Kingsmill and Brewery areas to the south and the Pottery Factory/Route 646 area, the Warhill Tract and Eastern State Hospital to the west and north. Completion of the Route 199 circumferential route will allow vehicles that originate or have destinations to the west, northwest and southwest of Williamsburg to bypass the central areas. In this way, more efficient travel is accomplished while reducing congestion in Williamsburg's pedestrian-oriented areas of Colonial Williamsburg and the College of William and Mary.

2.5 FUTURE TRAFFIC

Future projections, described later in Sections 4.1.2 and 5.1, indicate that by 1990 traffic demand will have increased to such a volume that intersection improvements will no longer be able to rectify the capacity problems.

Route 60 would have to be widened to 6 lanes by 1990 and 8 lanes by 2010 to accommodate projected demand traffic. Construction of this roadway would be inordinately expensive and would involve extensive relocations. For this reason, the Route 199 circumferential concept is being considered as a practicable alternative.

3.0 ALTERNATIVES

3.1 PREVIOUS STUDY

A previous draft Environmental Impact Statement (EIS) for the same Section of Route 199 was approved for public availability by FHWA on December 21, 1978. The two build alternatives which were considered are the same as Alignments A and D described in the present study.

Due to the length of time since preparation of the original draft EIS, the addition of Revised Line A, A-1 and A-2, and potential changes in the existing environment since 1978, it was decided that a new draft EIS should be prepared to determine and document project impacts.

3.2 DEVELOPMENT OF ALTERNATIVES

The alternatives (Alignments A, A-1, A-2, Revised Line A, D and the No Build and Transportation Systems Management Alternates) evaluated in this statement were developed over approximately an eight-year period. Officials of the City of Williamsburg, York County, James City County, Peninsula Metropolitan Planning Organization, the Peninsula Planning District Commission, and environmental agencies were involved in the development of these alternatives.

3.3 BUILD ALTERNATIVES

Two primary build alternatives, Alignments A and D and three secondary variations, Alignments A-1 and A-2 and Revised Line A have been considered. As seen in Figure 1-3, these are identical in two sections of their alignments, from Route 5 northward approximately 3,200 feet and in the vicinity of Route 60. All alternatives have the same ultimate termini. As a result of the Section 7, biological assessment for Isotria Medeoloides, Revised Line A was introduced to avoid the endangered species.

The minimum right-of-way width required would be 200 feet, including two 24-foot traffic lanes with a 40-foot center median, shoulders, and drainage ditches. See Figure 3-1 for a typical section.

Revised Line A - The Selected Alternative--The location of Revised Line A is the same as the location of Line A except in the vicinity of the endangered plant species. Revised Line A begins at Line D north of the Route 615 interchange. It moves northwest and curves north and northeast joining Line A approximately 4,800 feet north of Route 615. Figure S-1 shows Line A and the other proposed alignments discussed in this Environmental Impact Statement.

Alignment A--As seen in Figure 1-3, this alternative begins at the existing intersection of Routes 5, 199, and 616 at-grade and follows the existing corridor of Route 616 for approximately 1,800 feet before swinging away to the northwest. Then, on new alignment, it continues northward passing approximately 100 feet east of one of the streets in the Canterbury Hills residential development. Approximately 2,500 feet north of Route 5, Route 616 will be relocated and connected to Route 5 east of the Route 5/Route 199 intersection. Access to the Bethany Baptist Church will be from Route 616. Continuing northward, Alignment A crosses agricultural land and passes approximately 150 feet west of the undeveloped end of a street in the Indigo Terrace residential area.

Between Routes 616 and 615, Alignment A traverses open fields, agricultural, and forest lands, including the upper reaches of Mill Creek. Alignment A will initially connect at-grade with Route 615; however, sufficient right-of-way will be acquired to allow for the future construction of an interchange.

Between Routes 615 and 612, Alignment A crosses forest land, two tributaries to Chisel Run, and a portion of the Eastern State Hospital property.

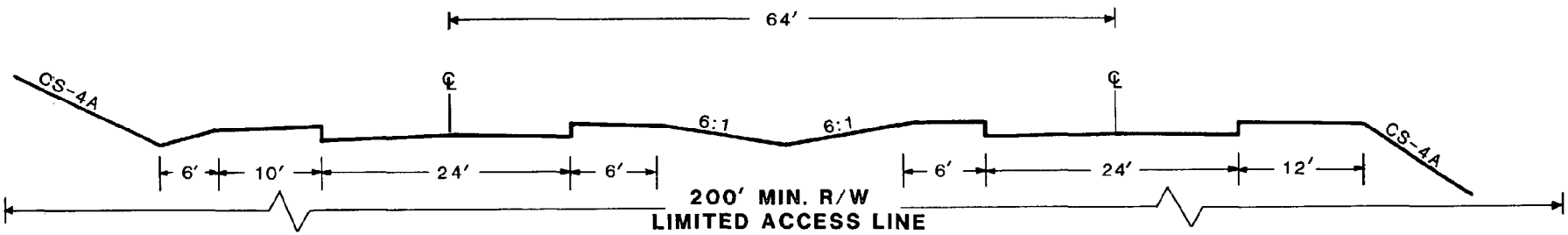
Alignment A initially intersects at-grade with Route 612; however, sufficient right-of-way will be acquired here also to allow for future interchange construction when traffic conditions warrant. In crossing Eastern State Hospital property, Alignment A will be at least 900 feet away from the closest hospital structure. This alignment also crosses the abandoned Eastern State Hospital sewage treatment plant. The hospital now utilizes the municipal sewage system.

FIGURE 3-1

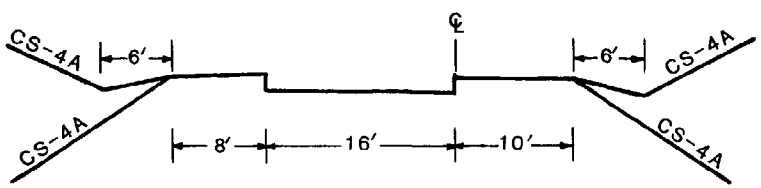
TYPICAL SECTIONS

ROUTE 199 CORRIDOR

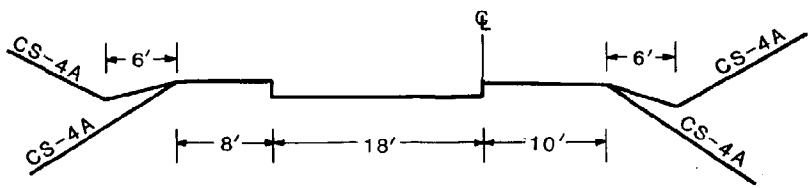
JAMES CITY AND YORK COUNTIES
VIRGINIA



FINGER RAMPS (Diamond)



LOOP RAMPS



From Route 612, Alignment A crosses the upper reaches of Chisel Run, traverses forest and agricultural land and crosses Route 658. Route 658 will be grade separated initially and no access to Route 199 for the fire station is planned. Access to Route 658 from Route 199 will be provided in the future as an interchange is proposed for Route 658.

After crossing Route 658, Alignment A parallels the VEPCO transmission line, crosses upper Long Hill Swamp just downstream of Scotts Pond, and swings toward Route 60. It connects with Route 60 south of the existing intersections of Routes 614 and 1000 with Route 60. An interchange is proposed between Route 199 and Route 60 on the west side of Route 60. This was planned in order to minimize impacts to residential development east of Route 60 and minimize construction difficulties. The proposed interchange will provide complete access.

The alignment will cross Route 60, the Chesapeake and Ohio Railway, and Route 603 on a bridge structure. For safety reasons, no access to the new facility will be allowed from Route 603. Motorists traveling on Route 603 and desiring to reach Route 199 will first have to travel on Route 646. Ultimately an interchange is planned at the intersection of Route 199 and Route 646.

From Route 603, the proposed Alignment A swings north to cross existing Route 646 and then parallels Route 646 to connect with the I-64 interchange. No modifications of this interchange are proposed. Service roads will be constructed along the alignment in this area to provide local access. These service roads and existing Route 646 will have direct access to Alignment A via an at-grade intersection approximately halfway between Route 60 and the I-64 interchange. York County has indicated that they need a minimum of one access point in this area to effectively implement their land development plans.

Alignment D--Alignments A and D are identical from Route 5 to approximately 3,500 feet north of Route 5. From the point of divergence, Line D continues northwestward, intersecting Route 615 west of Mount Pleasant Church. As in the case of Alignment A, provisions are included for the future construction of an interchange at Route 615, if traffic warrants. In this area

of the project, Line D crosses the upper reaches of Mill Creek, forest land, and agricultural land and passes approximately 350 feet east of an existing residential street.

From Route 615, Line D crosses three tributaries to Powhatan Creek, crosses Chisel Run, skirts the edge of the Windsor Forest Subdivision and Ford's Colony and crosses Long Hill Swamp, before tying into Route 612 at-grade. Sufficient right-of-way will be acquired to allow for the future construction of an interchange with Route 612 when future traffic warrants, probably sometime before the year 2010.

From Route 612, Alignment D passes west of Lafayette High School, crosses the Western Branch of Long Hill Swamp, and swings to the northeast to merge with Alignment A approximately 1,500 feet west of Route 60. Forested land and some cutover land is traversed in this area. Alignments D and A are identical from 1,500 feet southwest of Route 60 to 1,000 feet northeast of Route 60.

At this point, Alignment D swings away from Route 646 to pass south of some existing homes, traversing forest, agricultural land, and a tributary to Queen Creek before turning to connect to the I-64 interchange. Alignment D will allow Route 646 to remain intact.

York County officials have expressed a desire to have at least one point of access to Alignment D in this area in order to implement their future plans. Access has been incorporated and will align with the intersection of Route 646 and Route 199.

Alignment A-1--Alignment A-1 was considered at the southern end of the project to avoid involvement with the federally listed endangered plant species called the small-whorled pogonia (*Isotria medeoloides*). This alignment follows Alignment D for approximately 0.75 mile, then proceeds northeasterly for approximately 1.1 mile until it ties into Alignment A at Chisel Run.

Alignment A-2--Alignment A-2 is being considered to improve access conditions in the Pottery area. This alignment runs between Alignments A and D from Route 60 to I-64, but follows Alignment A elsewhere.

3.4 NO BUILD ALTERNATIVE

Under this alternative, no extension of Route 199 would occur. The facility would be left as it is now, with no action taken beyond periodic maintenance of the portion which already exists up to Route 5.

Although this study includes the development of multiple build alternatives, the No Build Alternative will be considered a viable alternative and will remain under consideration through the public hearing process.

3.5 ALTERNATIVES CONSIDERED BUT DROPPED FROM FURTHER EVALUATION

During the course of project development, several alternatives were considered and eliminated; Original Alignment A, Original Alignment A-1, Original Alignment A-2, Alignment C, Alignment C-1, Alignment AD and a Mass Transit Alternative. The alignments, depicted in Figure 3-2, were eliminated for the following reasons:

- They cross the Waller Mill Reservoir which is the public water supply for Williamsburg, a recreational resource for the area (Waller Mill Park), and a fresh water fisheries resource. The State Water Control Board, Commission of Outdoor Recreation, Commission of Game and Inland Fisheries, Virginia Division of Forestry, James City County, and Williamsburg were critical of these alternatives for this reason.

- They were not in keeping with James City County's planning. The County did not feel that alignments within such proximity to Williamsburg would serve their transportation and development needs.

- Original Alignments A, A-1, A-2 and C-1 would require an interchange with I-64 between the I-64 interchanges with Route 646 and Route 143. The Route 646 interchange was considered more desirable because of the large area of developable land it could serve.

  The original Alignment A-1, a short section of proposed roadway between Route 615 on Alignment D where A-1 ties back into Alignment A, was eliminated from further consideration in the 1978 draft EIS because it did not offer any real advantages over Alignment A and would have cost approximately $250,000 more. Since then, it was discovered that the proposed Alignment A traversed an area containing the small-whorled pogonias. Alignment A-1 has, therefore, been re-introduced as a viable alternative to the southern portion of Alignment A which will avoid the endangered plants.

Consideration was given to terminating the proposed project at Route 60 but it was felt that this alternative would not adequately serve the area, nor would it function as a true bypass.

A suggestion to move Alignment D west of its present location was eliminated because it was not in keeping with James City County's planning and it would have crossed Middle Plantation, a planned community which had a developed road system and services. (No houses had been built.) In addition, the farther west an alignment is located, the less traffic it will carry.

A suggestion was made to move Alignment D east of its present location. A slight shift to the east was eliminated because it would significantly impact the Windsor Forest Subdivision. In addition, it would still cross the Chisel Run floodplain.

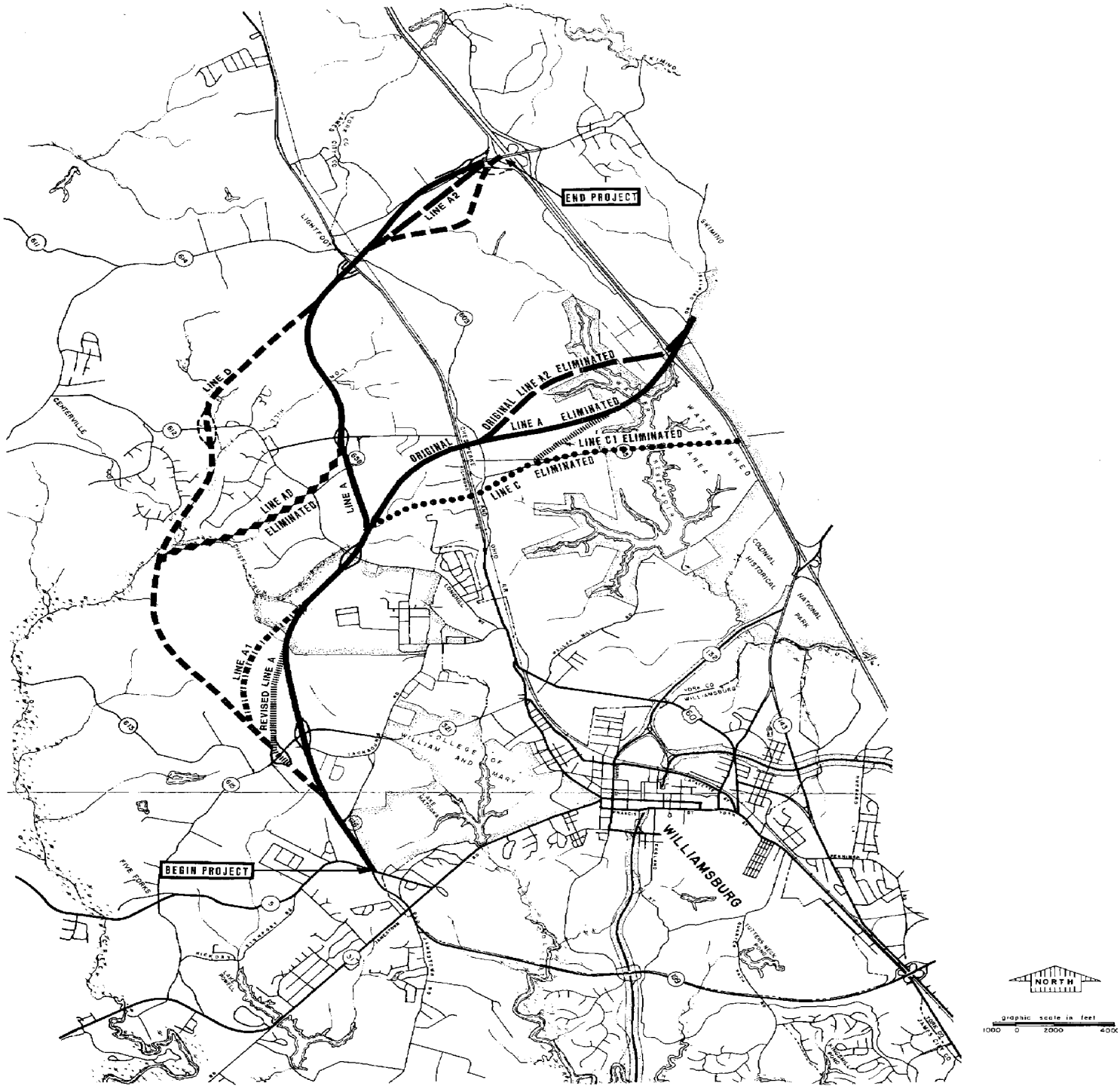
An alignment between A and D (Alignment AD), as depicted in Figure 3-2, was eliminated because it would impact more nontidal forested wetlands than Alignment A. It would also result in more stream crossings and floodplain encroachment than Alignment A. According to James City County officials, it

FIGURE 3-2

ALIGNMENTS CONSIDERED

ROUTE 199 CORRIDOR

JAMES CITY AND YORK COUNTIES
VIRGINIA



would have traversed the proposed development area of an existing residential area, and it was not in keeping with James City County's development plan.

A Mass Transit Alternative was also considered. This alternative addressed the benefit of an improved mass transit system on highway demand. There is minimum public transit available within the study area and the existing transit ridership levels have minimal impact on the area travel demand and its associated traffic volumes. Discussions with James City County Transit Authority and Virginia Department of Transportation (VDOT) indicate that they anticipate a minimal, if any, increase in transit service in the next five years. There are currently no plans to increase the number of routes, route miles, or equipment. With the uncertainty of continued federal funding of local transit, it was assumed that the transit impact would be minimal in 1990.

In order to project the maximum level of transit service in the year 2010, a review was made of transit usage in medium-to-large cities. Cities such as Tucson, Arizona, and Memphis, Tennessee--where extensive transit systems are currently operating--have transit serving approximately 1.5 to 3 percent of the daily trips. Both cities are spread out similar to Williamsburg. New Orleans, a much more compact city, has approximately 10 percent of its daily trips made by transit and represents a maximum amount of transit usage. Additionally, the tourist trade in Williamsburg is not conducive to the transit market. A high estimate of feasible transit usage in Williamsburg would be the level that is being achieved in a medium-size city with an extensive transit system. Therefore, it was assumed that 5 percent of the work trips and 2.8 percent for all other trips could be accommodated by transit. This results in an overall transit ridership of 3 percent, which would not be great enough to eliminate the need for major roadway improvements.

3.6 TRANSPORTATION SYSTEMS MANAGEMENT

Inflationary construction costs and uncertain fuel supplies have made it mandatory that existing transportation facilities be efficiently managed and that low cost improvements be considered before committing funds for more

costly projects. The process to achieve this objective is called Transportation Systems Management (TSM). Typical TSM techniques include intersection improvements, traffic signal synchronization, removal of on-street parking, controlling access, reversible lanes, one-way pairs, transit, and nonmotorized means of transportation.

The Transportation Systems Management Element, developed by the Metropolitan Planning Organization (MPO), recommends short-range highway improvements, improvement of the transit system, carpool-vanpool programs, park-n-ride lots, bikeways, and transit improvements to accommodate the elderly and handicapped. Several highway improvements, including two intersection improvements on Route 60, an alternate route to the proposed Route 199 circumferential, were specifically recommended. These were Route 60 at Ridgeway Place and Route 60 at Turlington Road.

Even if all the proposed TSM techniques recommended in the Peninsula Area Transportation Study are implemented, the new transportation facilities (including the Route 199 extension) and major improvements to existing facilities which are recommended in the Long Range Transportation Element of that document, will still be needed to accommodate projected traffic demand at an acceptable level of service.

4.0 AFFECTED ENVIRONMENT

4.1 TRAFFIC AND TRANSPORTATION

4.1.1 Existing Traffic

The existing traffic operations in the study area were analyzed to provide an assessment of the level of service being provided in the Williamsburg area. Based on discussions with VDOT, 15 intersections were selected as indicators of operating conditions. These intersections include the major arterial-arterial intersections in the study area and encompass all signalized intersections.

Peak hour turning movement counts were conducted at each intersection. In addition, an inventory of existing conditions was performed. The inventory included geometry, traffic control, traffic signal timing and phasing (if appropriate), parking conditions and bus stop conditions. These data were used to conduct capacity analyses at each intersection. Figure 4-1 shows existing traffic conditions. The methodology outlined in the Highway Capacity Manual, TRB Special Report 209 was used in this analysis. The analyses were performed using the microprocessor based computer program CAPCALC developed by Roger Creighton Associates. The analysis includes a capacity evaluation (volume-to-capacity ratio) and a level of service evaluation (measured by delay). Table 4-1 lists the results of the capacity evaluations. The Traffic and Transportation Technical Report provides a detailed description of the operations.

The capacity analysis methodology outlined in the 1985 Highway Capacity Manual is substantially different from previous methods of evaluating intersection operations. The methodology for signalized intersections includes two calculations, a volume-to-capacity ratio and a level of service calculation. The volume-to-capacity ratio is an indicator of the amount of available capacity that is being used by the traffic volumes traversing the intersection. The level of service calculation is an estimate of average delay per vehicle and this is not

Table 4-1
Existing Traffic Capacity Analysis

Intersection	Existing Conditions AM Peak Hour V/C[1]	LOS	PM Peak Hour V/C	LOS
Route 60 & Route 646	0.391	B	0.555	B
Route 60 & Route 614	0.368	B	0.455	B
Route 60 & Route 658	170	D	-86	F
Route 612 & Route 658	N/A		548	A
Longhill Road & Route 615	176	D	209	C
Route 60 & Route 615	1.251	F	0.882	C
Route 616 & Route 615	N/A		220	C
Route 60 & Route 132	0.443	C	0.628	C
Henry Street & Lafayette Street	0.535	B	0.863	C
Route 199 & Jamestown Road	0.620	C	0.954	C
Richmond Road & Route 60	0.819	B	1.201	B
Page/Lafayette/Francis/Route 60	0.283	C	0.303	D
Boundary Street & Francis Street	296	C	260	C
Richmond Road/Jamestown Road/ Boundary Street	134	D	-22	F
Route 615 & Route 321	0.404	B	0.820	B
Richmond Road/Lafayette Street/ Monticello Avenue	0.589	C	1.163	D

[1]Volume to capacity ratio for signalized intersections and reserve capacity for unsignalized intersections.

N/A indicates that count information was not available for the morning peak period.

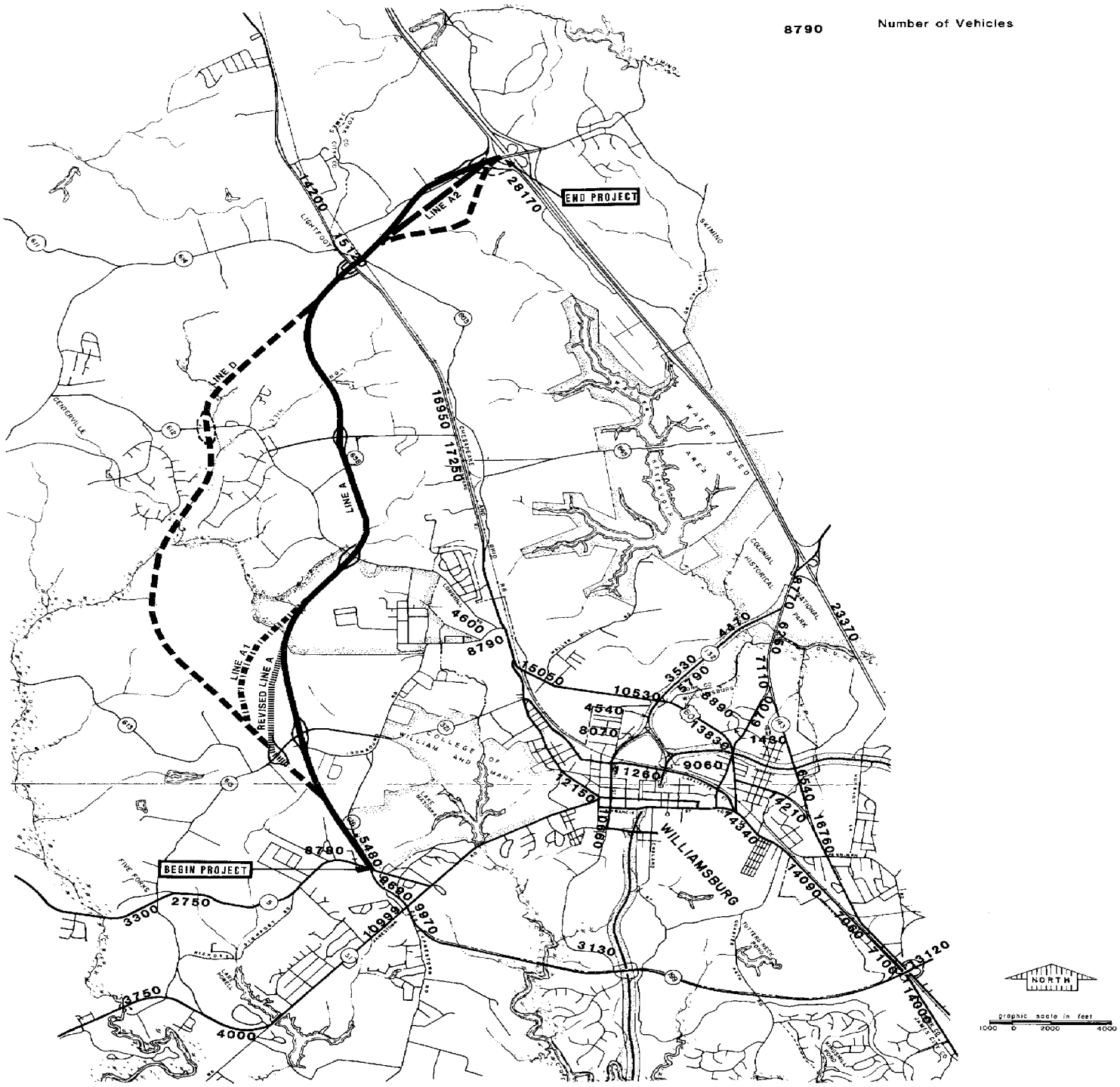
Source: DSA Group, Inc., 1985.

FIGURE 4-1

EXISTING AVERAGE DAILY TRAFFIC VOLUMES

ROUTE 199 CORRIDOR

JAMES CITY AND YORK COUNTIES
VIRGINIA



necessarily directly related to the capacity of the intersection. As stated in the Manual, it is possible for an intersection to have a volume-to-capacity ratio greater than one and an acceptable level of service (Level of Service D or better). It is also possible for an intersection to have a volume-to-capacity ratio of less than one and an unacceptable level of service (Level of Service E or F). Therefore, it is necessary to evaluate both calculations. Therefore, if either calculation is beyond acceptable limits, the intersection operations are considered unacceptable. To accommodate this, Table 4-1 lists both the volume-to-capacity ratio and the level of service.

As stated, the above applies to signalized intersections only. For unsignalized intersections, the capacity evaluation is only the calculation of reserve capacity (unused capacity available). Unlike signalized intersections, this is directly related to level of service (see Table 10-3 on page 10-9 in the Manual). While the reserve capacity and level of service are redundant, they have both been included in Table 4-1 to provide information about where in the range of each level of service each intersection is operating. It should be noted that the level of service for signalized intersections and unsignalized intersections are based on different criteria and, therefore, are not comparable. This is stated in the Manual (see page 10-9 in the Manual). However, the same criteria of acceptable levels (i.e., Level of Service D) can be used.

As seen in Table 4-1, there are some existing operational problems. The unsignalized intersections of Route 60 and Route 658 and Richmond Road/Jamestown Road/Boundary Street are operating at unacceptable levels during the evening peak hour. The signalized intersection of Route 60 with Ironbound Road is operating at capacity with Level of Service F during the morning peak hour, although evening peak hour conditions at this intersection are at an acceptable level. The intersection of Richmond Road/Lafayette Street/Monticello Avenue is operating at capacity during peak periods, however the delay is within acceptable limits. Overall, the street system is operating at acceptable levels. Improvements at the four

intersections discussed previously will allow the existing system to provide acceptable operating conditions.

4.1.2 Future Development

The future traffic conditions in the study area are a function of the area's development and the available transportation system. The future transportation system serving Williamsburg is discussed in detail in the Traffic and Transportation Technical Report, along with the development used for forecasting traffic. The following briefly summarizes the future conditions as they relate to traffic.

The roadway system used in the analysis included all improvements outlined in the most current Thoroughfare Plan (Year 2000 Plan). These include: 1) the extension of Monticello Avenue to Waller Mill Road, 2) the extension of Parkway Drive to Route 143, and 3) the Grove interchange on I-64. The build alternative alignments included the roadway improvements outlined above.

The traffic forecasts were developed using a standard travel demand model. The microprocessor based computer program MINUTP, developed by COMSIS Corporation, was used in this analysis. The traffic is forecasted based upon population and employment densities within the study area. The procedure is outlined in the Traffic and Transportation Technical Report. The existing development densities (1980 base year conditions) were obtained from the Peninsula Planning District Commission (PPDC) and were based on 1980 Census information. The projections for 1990 and 2010 were developed from PPDC projections for 2005, development plans and trends in the area, and discussions with representatives of James City and York Counties and the City of Williamsburg. Figures 4-2, 4-3, and 4-4 show the projected 1990-2010 traffic conditions for each alternative alignment.

The specific projections are discussed in detail in the Socioeconomic and Transportation Technical Reports. The major growth is anticipated in the Pottery area and the Warhill Tract north of Williamsburg,

FIGURE 4-2

NO BUILD ALTERNATIVE TRAFFIC FORECASTS
ROUTE 199 CORRIDOR

JAMES CITY AND YORK COUNTIES
VIRGINIA

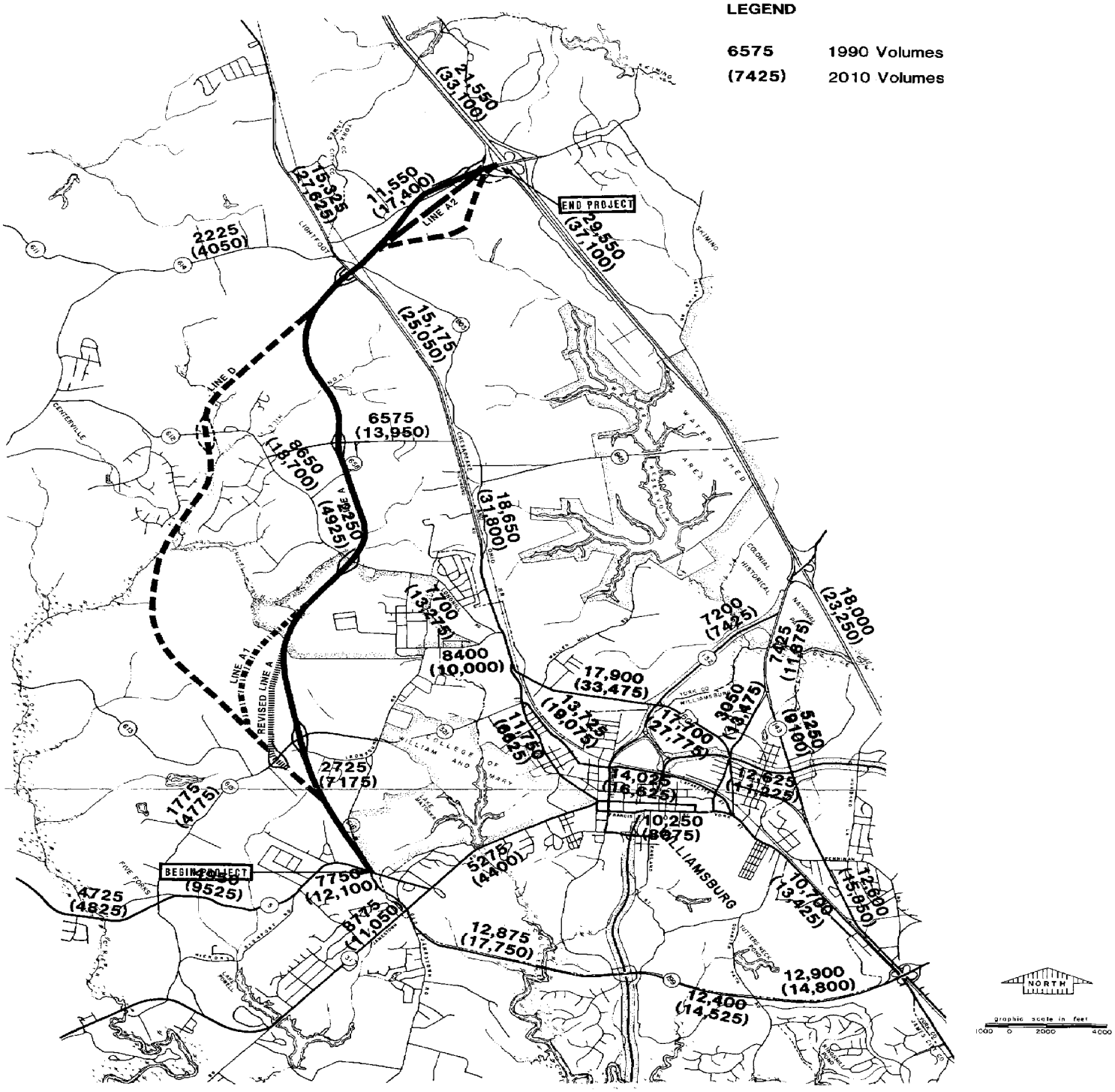


FIGURE 4-3

ALIGNMENT A TRAFFIC FORECASTS
ROUTE 199 CORRIDOR

JAMES CITY AND YORK COUNTIES
VIRGINIA

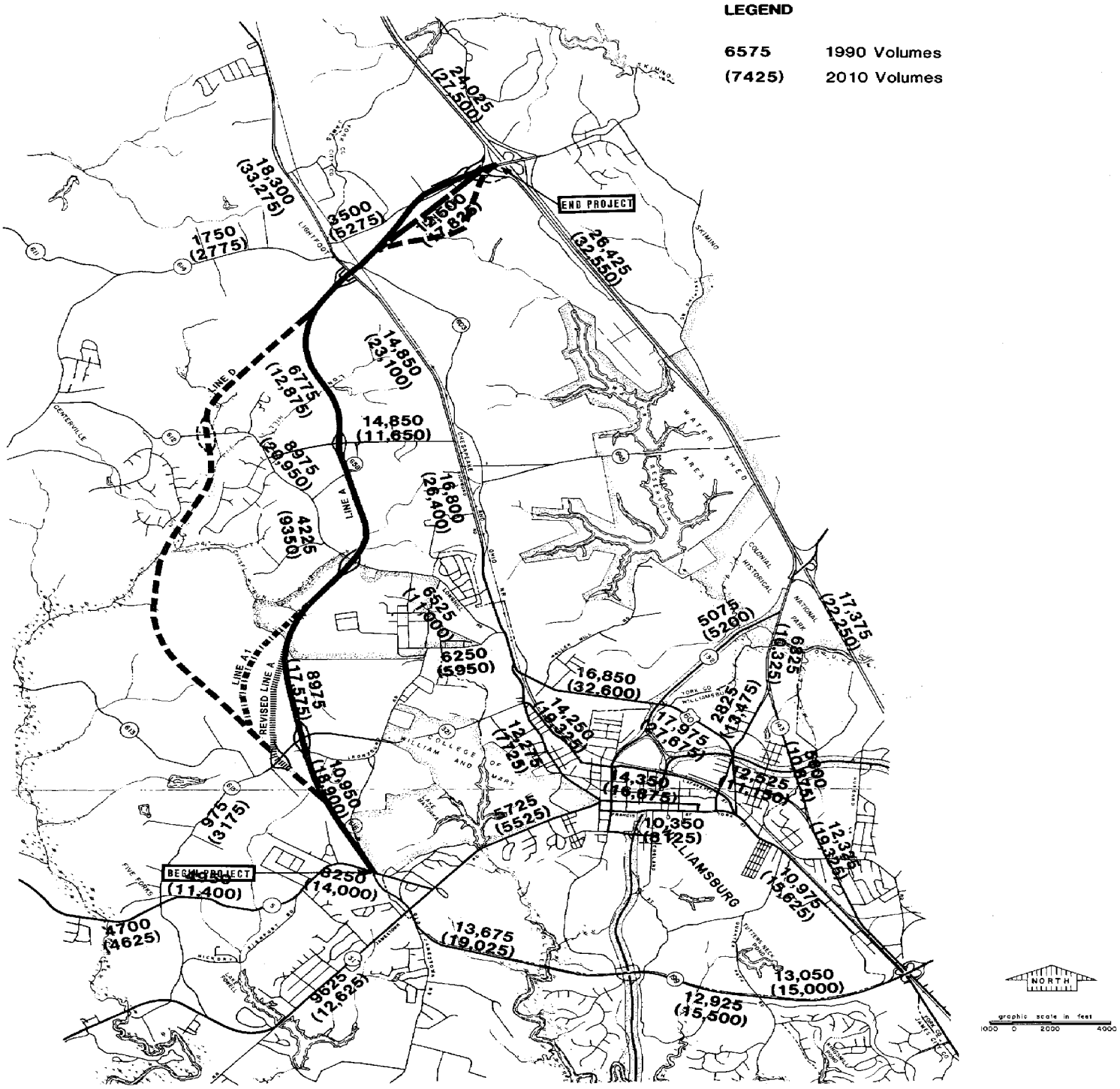


FIGURE 4-4

ALIGNMENT D TRAFFIC FORECASTS

ROUTE 199 CORRIDOR

JAMES CITY AND YORK COUNTIES
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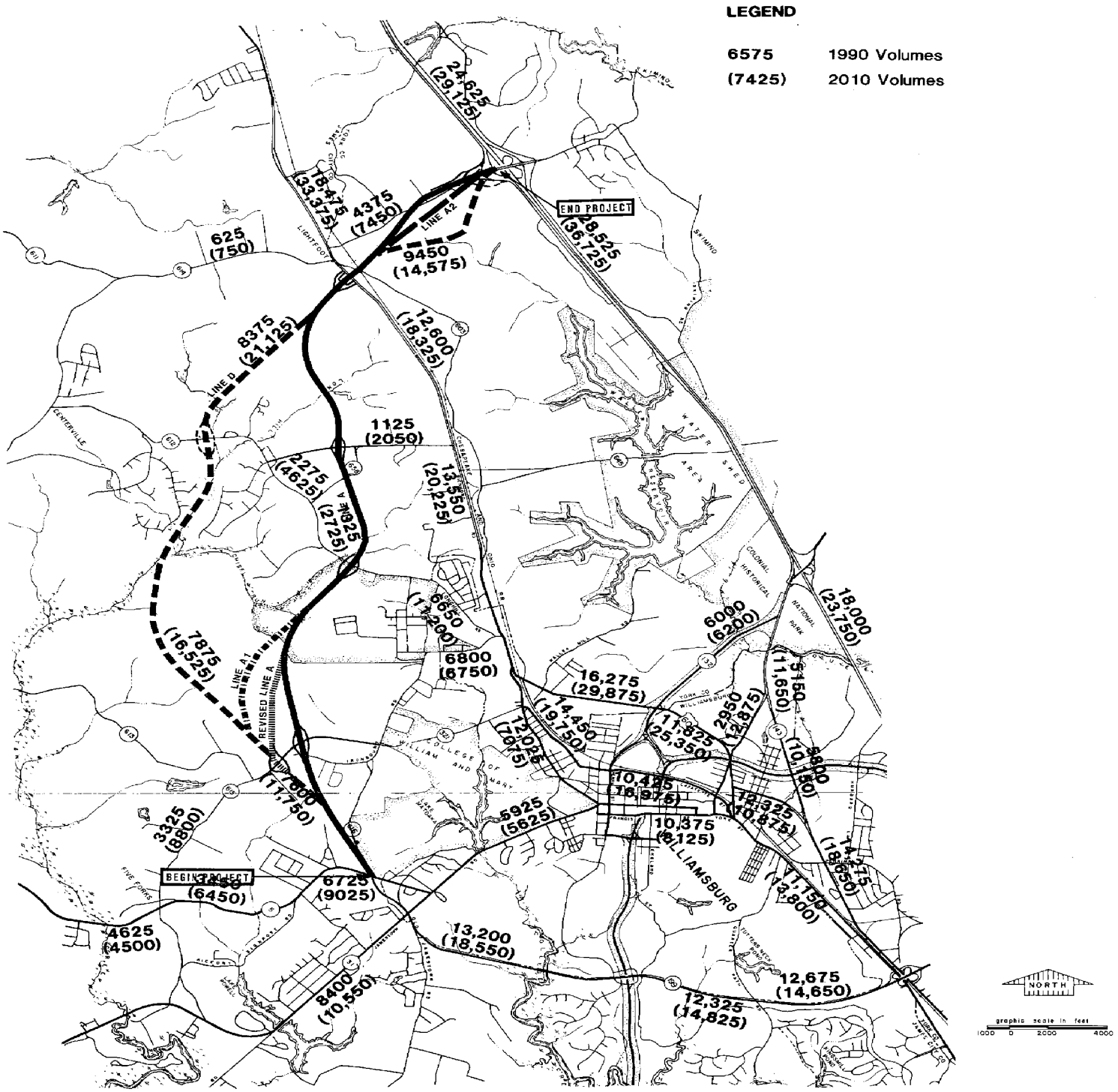


and the Kingsmill on the James and Brewery area south of Williamsburg.

A significant factor affecting traffic conditions in Williamsburg is the tourist trade. As discussed in the Technical Reports, tourist trade declined in the area during the early 1980s. It has increased recently and is believed to have stabilized. Tourist traffic for Colonial Williamsburg, the Pottery, Busch Gardens, and Jamestown Festival Park was included in the forecasts.

The future conditions assessment encompassed three parts. The first involved the capacity analyses conducted at the 15 intersections analyzed under existing conditions. The second part involved an analysis of the operations on Route 199 and the interchanges and intersections. Finally, the system improvements necessary to accommodate the projected traffic volumes were discussed.

4.1.2.1 Future Conditions Capacity Analysis

Capacity evaluations were conducted for the peak period for the selected intersections for each alternative. The traffic volumes for 1990 and 2010 were forecast using the travel demand model previously discussed. As with the existing conditions, the methodology outlined in the 1985 Highway Capacity Manual was used. Table 4-2 lists the operating conditions in 1990 for the three alternatives. As seen in the table, five intersections will operate at unacceptable levels (LOS E or F) in 1990 under the No Build Alternative. With Alignment A, four intersections will still operate at an unacceptable level, while Alignment D would only have two. Of the intersections projected to operate below Level of Service D for both the No Build Alternative and Alignment A, two are unsignalized. The installation of traffic signals at the intersections of Routes 60 and 658 and Longhill Road and Ironbound Road will improve operations to acceptable levels. Utlimately, an interchange is planned at Route 658. The construction of Route 199 (either alignment) will allow the intersection of Route 60 and Ironbound Road to operate at an acceptable level. Under all alternatives, improvements need to be made on Richmond Road (Route

Table 4-2
1990 Capacity Analyses

Intersection	No Build V/C[1]	No Build LOS[2]	Alignment A V/C[1]	Alignment A LOS[2]	Alignment D V/C[1]	Alignment D LOS[2]
Route 60 & Route 646	0.811	C	0.488	C	0.502	C
Route 60 & Route 614	0.473	B	0.404	B	0.413	B
Route 60 & Route 658	(0.613)	(B)	(0.965)	(C)	(0.318)	(B)
	-189	F	-644	F	150	D
Route 612 & Route 658	(0.302)	(B)	(0.771)	(C)	(0.079)	(B)
	464	A	116	D	795	A
Longhill Road & Route 615	(0.734)	(B)	(0.648)	(B)	(0.560)	(B)
	-13	F	71	E	187	D
Route 60 & Route 615	1.105	F	0.968	D	0.807	D
Route 616 & Route 615	(0.842)	(F)	(0.497)	(B)	(0.530)	(B)
	182	D	310	B	293	C
Route 60 & Route 132	0.688	C	0.586	C	0.666	C
Henry & Lafayette	0.818	C	0.818	C	0.869	C
Route 199 & Jamestown Rd.	0.913	C	0.743	C	0.925	C
Richmond Rd. & Route 60	1.565	F	1.445	F	1.331	E
Page/Lafayette/Francis/60	0.323	C	0.395	D	0.393	D
Boundary St. & Francis St.	(0.536)	(B)	(0.621)	(B)	(0.568)	--
	320	B	696	B	385	B
Richmond Rd./Jamestown Rd./	(0.311)	(B)	(0.321)	(B)	(0.248)	(B)
Boundary Street	357	B	401	A	378	B
Route 615 & Route 321	1.089	C	0.844	C	0.969	C
Richmond Rd./Lafayette St./ Monticello Avenue	2.084	F	1.939	F	2.017	F

( ) Indicates operation if signalized.

[1]Volume-to-Capacity ratio for signalized intersections and reserve capacity for unsignalized intersections.

[2]LOS is Level of Service.

Source: DSA Group, Inc.

60) at the intersection with Route 60 Bypass and the intersection with Lafayette Street/Monticello Avenue.

The results of the 2010 capacity analyses are listed in Table 4-3. Under the No Build Alternative, 12 of the 16 intersections will operate at unacceptable levels. With Alignment A, nine intersections will provide unacceptable operation while ten intersections are anticipated to operate at unacceptable levels with the construction of Alignment D. The installation of traffic signals at the over-capacity unsignalized intersections will provide acceptable operations under all alternatives except at the intersection of Routes 616 and 615 in the No Build scenario.

The intersections of Richmond Road (Route 60) with Ironbound Road, Route 60 Bypass, and Lafayette/Monticello will still need to be improved under all alternatives. It should be noted, however, that the build alignments significantly lower the projected volumes on Route 60, thus they will require significantly less improvements than the No Build Alternative.

Route 199 is proposed to have a four-lane divided cross section. Initial construction will provide at-grade intersections at the following locations: Route 615, Route 612 and Route 646. Interchanges will be provided at the time of construction at Route 60 and Interstate 64. When warranted, interchanges are proposed to be constructed at Routes 612, 615 and 646. Access to the Warhill Tract development will be from Route 60.

The evaluation of route operations included an assessment of the ability of the main line to accommodate the projected volumes and peak period capacity analyses at the ramp terminals and intersections. For purposes of this analysis, it was assumed that interchanges had been constructed at Routes 615 and 612.

According to the 1985 Highway Capacity Manual, the capacity of Route 199 is 25,000 to 35,000 vehicles per day, depending on the

Table 4-3
2010 Capacity Analyses

Intersection	No Build V/C[1]	No Build LOS[2]	Alignment A V/C[1]	Alignment A LOS[2]	Alignment D V/C[1]	Alignment D LOS[2]
Route 60 & Route 646	1.348	C	0.826	C	0.870	C
Route 60 & Route 614	1.147	B	0.731	B	0.780	B
Route 60 & Route 658	(0.900)	(C)	(0.984)	(B)	(0.584)	(B)
	-587	F	-478	F	-33	F
Route 612 & Route 658	(0.646)	(C)	(0.731)	(B)	(0.152)	(B)
	-98	F	-83	F	701	A
Longhill Road & Route 615	(1.148)	(B)	(0.962)	(B)	(0.958)	(B)
	-400	F	-184	F	-177	F
Route 60 & Route 615	1.704	F	1.476	F	1.290	F
Route 616 & Route 615	(1.460)	(F)	(0.722)	(B)	(0.872)	(C)
	-298	F	146	D	73	E
Route 60 & Route 132	1.159	D	1.299	D	1.254	F
Henry & Lafayette	1.872	C	1.319	D	1.334	D
Route 199 & Jamestown Rd.	1.355	D	1.416	E	1.345	D
Richmond Rd. & Route 60	2.647	F	2.416	F	1.973	F
Page/Lafayette/Francis/60	0.334	C	0.328	D	0.333	C
Boundary St. & Francis St.	(0.303)	(B)	(0.318)	(B)	(0.318)	(B)
	600	A	574	A	825	A
Richmond Rd./Jamestown Rd.	(0.168)	(B)	(0.187)	(B)	(0.188)	(B)
Boundary Street	661	A	401	A	520	A
Route 615 & Route 321	1.604	F	1.008	C	1.275	D
Richmond Rd./Lafayette St./ Monticello Avenue	2.291	F	2.233	F	2.387	F

( ) Indicates operation if signalized.

[1]Volume-to-Capacity ratio for signalized intersections and reserve capacity for unsignalized intersections.

[2]LOS is Level of Service.

Source: DSA Group, Inc.

impact of the at-grade intersections. The projected traffic volumes on Route 199 vary from approximately 12,000 to 21,000 vehicles per day by 2010. These projections are well below the capacity. Therefore, four-lane divided facility is adequate for at least the next 25 years.

The operation of the intersections and interchanges was evaluated using peak period capacity evaluations. The following describes the evaluation of the two alignments.

Alignment A and Revised Line A

The operating conditions along Alignment A will be well within acceptable limits. As previously stated, the results of the Alignment A evaluations apply to Alignments A, A-1, A-2 and the selected alternative, Revised Line A. The results of the capacity analyses are listed in Table 4-4. As seen in the table, the ramp terminals for the interchanges at Route 615, Route 612 and I-64 will operate under stop sign control through 2010. The southbound off-ramp at 615 will have a limited capacity reserve in 2010 indicating the possible need for a traffic signal. Traffic signals will need to be installed at the ramp terminals of Routes 199 and 60.

Access from Route 199 to the Warhill tract was studied as part of the initial traffic analysis. However, it has been determined that the selected alternative, Revised Line A would not provide access from Route 199, but would allow access from Route 60.

The intersection of Route 646 and Route 199 will serve as primary access to the high density retail and tourist development projected for the Pottery area. Several intersection geometrics were analyzed for this location due to the high volume of turning movements. The analysis indicates that the following geometrics are required to operate at-grade:

TABLE 4-4

Alignment A Capacity Analyses

Intersection	1999 V/C(1)	1999 LOS(2)	2010 V/C(1)	2010 LOS(2)
Route 615 Southbound Ramps	275	C	60	E
Route 615 Northbound Ramps	611	A	443	A
Route 612 Southbound Ramps	562	A	370	B
Route 612 Northbound Ramps	563	A	388	B
Route 60 Southbound Ramps	0.376	B	0.544	B
Route 60 Northbound Ramps	0.525	B	0.823	B
Warhill Tract Access Drive	640	A	119	D
Route 646(3)	0.447	B	0.876	D
I-64 Southbound Ramps	296	C	204	C

(1) Volume-to-capacity ratio for signalized intersections and reserve capacity for unsignalized intersections.

(2) Level of Service.

(3) Assumes dual left-turn lanes and dual right-turn lanes on Route 199 and a seven (7) lane cross section on Route 646.

Source: DSA Group, Inc.

Southbound Route 199:	Dual right-turn lanes, two through lanes, and a left-turn lane.
Northbound Route 199:	a shared through and right-turn lane, a through lane, and dual left turn lanes.
Westbound access from Zone 71:	a right-turn lane, a through lane, and a left-turn lane.
Eastbound Route 646:	dual right-turn lanes, a through lane, and dual left-turn lanes.

While this configuration is projected to operate at Level of Service C, the intersection will be massive and confusing to motorists. The confusions, accident potential, and delays associated with this large an intersection indicate that a grade separation would be appropriate. This could be accommodated at the proposed intersection location. A full interchange will be necessary to accommodate traffic at this intersection by the year 2010.

Alignment D

The analysis of Alignment D indicates that this alignment will also operate within acceptable limits. The results of the capacity analyses are listed in Table 4-5. As seen in the table, the interchange of Route 60 and Route 199 will need to be signalized at the time of construction. In addition, the interchanges at Routes 612 and 615 will need to be signalized prior to 2010. This is due to the increased volume accessing Route 199 at these interchanges.

The increased volume on Route 199 also indicates the need for signalizing the access drive to the Warhill Tract. There will not be adequate gaps in Route 199 traffic for the development traffic, and geometric improvements alone will not provide acceptable operations. It should be noted, however, that this is predicated on the projected

TABLE 4-5

Alignment D Capacity Analyses

Intersection	1999 V/C(1)	1999 LOS(2)	2010 V/C(1)	2010 LOS(2)
Route 615 Southbound Ramps	215	C	-29 (0.433)	F (B)
Route 615 Northbound Ramps	295	C	56 (0.377)	E (B)
Route 612 Southbound Ramps	323	B	-125 (0.655)	F (B)
Route 612 Northbound Ramps	204	C	-108 (0.681)	F (B)
Route 60 Southbound Ramps	0.226	B	0.379	B
Route 60 Northbound Ramps	0.291	B	0.685	B
Warhill Tract Access Drive	320	B	26 (.303)	E (A)
Route 646(3)	0.468	C	0.670	D
I-64 Southbound Ramps	256	C	149	D

( ) Indicates traffic signal control.

(1) Volume-to-capacity ratio for signalized intersections and reserve capacity for unsignalized intersections.

(2) Level of Service.

(3) Assumes dual left-turn lanes and dual right-turn lanes on Route 199 and a seven (7) lane cross section on Route 646.

Source: DSA Group, Inc.

land use for the Warhill Tract. If there is a major change in land use type and/or density, this intersection will need to be re-examined.

The analysis of the intersection of Route 646 and Route 199 indicates the need for the same cross-section requirements as Alignment A. Given the proximity of the intersection to the I-64 interchange for this alignment, additional queuing and weaving problems are expected. At a minimum, the intersection will need to be relocated to the southwest (to approximately the location on Alignment A) to alleviate queuing and weaving problems. As with Alignment A, it is recommended that the intersection be grade-separated to alleviate safety and delay problems.

The third part of the needs analysis involved an evaluation of the roadway system and the need for improvements, other than the construction of Route 199, to accommodate the projected traffic volumes safely and efficiently. This involved the identification of capacity deficiencies in the No Build Alternative street system and those that are alleviated by the construction of Route 199.

The methodology for the evaluation of roadway capacity is defined in the 1985 Highway Capacity Manual. For rural roads, a range of daily traffic volumes is defined for each level of service. For urban streets, average travel speed is used to establish the level of service. It is not possible to measure the travel speed for a future condition.

Outside of the City of Williamsburg, the majority of the roadways operate as rural highways, even though they may be considered within the urban area. According to the 1985 Highway Capacity Manual, an urban or suburban arterial is defined as a facility with signalized intersection spacing of 2 miles or less. In addition, roadside development can be intense, producing side friction to traffic and limiting travel speed. Other than along Route 60, there are no traffic signals today along the street system outside Williamsburg. In addition, the projected traffic volumes do not indicate a need for a significant

number of signals (with spacing of 2 miles or less). Therefore, for purposes of this analysis, the roadways outside the City of Williamsburg were analyzed as rural highways. This was discussed with representatives of VDOT and they concurred that this area is outside the truly urbanized area and the roadways will actually operate as rural roadways rather than urban streets.

The capacity deficiencies were identified using the criteria for rural roadways outlined in Table 4-6. These criteria were developed using the 1985 Highway Capacity Manual. The results of the system capacities are listed in Table 4-7 for each of the alternatives for both 1990 and 2010.

In 1990, the No Build Alternative has over 8.5 miles of deficient roadways. Alignment A has 10.6 miles of roadway operating at Level of Service D or lower, and Alignment D has 4.6 miles of deficiencies. The miles of deficient roadways under Alignment A are overstated due to the segments of Routes 5 and 31, which are only slightly over Level of Service C.

By the year 2010, over 22 miles of roadway will be deficient under the No Build Alternative. This is decreased by 35 percent, to 14.26 miles under Alignment A. Alignment D decreases the mileage by 38.7 percent to only 13.48 miles. This substantial reduction includes relief to Longhill and Ironbound Roads (a currently congested area) and Routes 616 and 646. Under all alternatives, Route 321, Old Jamestown Road, and portions of Routes 5 and 31 will need to be widened to four lanes.

The urban street system evaluation methodology outlined in the 1985 Highway Capacity Manual requires the use of travel speed. Since it is impossible to do speed studies on future conditions, the intersection

Table 4-6
Rural Road Daily Traffic Service Volumes

L.O.S.	Service Volume	
	2-lane Street	4-lane Street
A	2,400	28,000
B	4,800	44,000
C	7,900	56,000
D	13,500	70,000
E	22,900	80,000
F	22,900	80,000

Table 4-7
Two Lane Rural Roadways Over Capacity

Alternative	1990 L.O.S. D	1990 L.O.S. E or F	2010 L.O.S. D	2010 L.O.S. E or F
No Build	7.15	1.46	12.78	9.18
Alignment A (A-1, A-2, Revised Line A)	8.85	1.78	9.15	5.11
Alignment D	3.14	1.46	9.00	4.48

analyses were used as an indicator of urban street operations. As previously discussed, the intersections along Route 60 will experience problems for all alternatives. The capacity deficiencies are worse for the No Build Alternatives. The construction of Route 199 will decrease volumes on Route 60 by approximately 16 to 35 percent for Alignments A and D respectively. This decrease will significantly lessen the necessary additional roadway improvements. While Route 60 will need to be improved under all alternatives, the extent of the improvements necessary under the build alternatives will be greatly reduced. The roadway will need to provide 6 lanes from south of Lafayette Street to north of Route 645 for the build alternatives. For the No Build Alternative, an 8-lane cross section will need to be provided from Route 60 Bypass to Ironbound Road to accommodate the 47,000 vehicles projected. This will be difficult, if not impossible, to accomplish due to development in the area. The construction of Route 199 will eliminate this need.

4.1.3 Truck Routes

Neither the City of Williamsburg nor the Virginia Department of Transportation (VDOT) has established signed truck routes through the City of Williamsburg; however, signs have been placed by private initiatives to prevent trucks from entering Colonial Williamsburg. At the present time, there are several truck route signs located at the intersections of Capital Landing Road and Page Street; Francis Street/Lafayette Street/Page Street and Highway 60; Jamestown Road/Boundary Street and Richmond Road; and Richmond Road and Highway 60 (Bypass Road). There are also several "trucks prohibited" signs located at the intersections of Francis Street/Lafayette Street/Page Street and Highway 60; and Francis Street and Henry Street.

4.2 LAND USE

The three jurisdictional areas affected by the construction of Route 199 include James City County, York County (i.e. the area north of Route 238 and, thereby, includes the Naval Weapons Station), and the City of Williamsburg. For discussion purposes, the following sections on existing and planned land uses are separated into the three study area jurisdictions, mentioned above.

A more detailed discussion of land use in the James City County, York County, and Williamsburg areas is included in the Socio-Economic Technical Report.

4.2.1 Existing Land Use

The majority of the three study areas consist of undeveloped and/or open public lands (i.e., 58-88 percent of the total land area). Developed land consists mostly of single-family residential dwellings. The following discussion highlights the important existing land use elements and provides associated acreage and percentage estimates by specific locality.

James City County--James City County comprises 96,636 acres or 71.5 percent of the total land area under study ("Evaluation of Land Uses and Zoning Districts," Working Paper #4, James City County, November 1982, p. 4). Over 88 percent or roughly 85,263 acres of James City County is agricultural, forested, or vacant land. The remaining 12 percent (11,374 acres) of the County's land area contains various urban or built-up categories of land use including residential, communications and utilities, institutional, commercial and services, transportation, and industrial.

The "Primary Service Area," which consists of 43,188 acres or 44.7 percent of the County, consists of areas presently served with public

water, sewer, and emergency and community services. Most of the urban development (7,786 acres or 8.1 percent) exists within this "Primary Service Area." Approximately 34 percent of land use in developed James City County is characterized by single-family, detached, residential development ("Evaluation of Land Uses and Zoning District," Working Paper #4, James City County, November 1982, p. 4). Approximately 66 percent of the remaining developed land uses are concentrated around the City of Williamsburg (i.e., roads, club/civic organizations, institutional facilities, landfill, campgrounds, mobile homes, railroad, and other minor uses).

York County--Approximately 26.1 percent of the three study areas or 35,194 acres are in York County (York County Land Use Plan, Department of Planning, January 1983, pp. 4-19). Roughly 58 percent of the existing land in the county is being used by the federal government. This includes the Camp Peary Naval Reservation, the U.S. Naval Supply Center Cheatham Annex, and the U.S. Naval Weapons Station. Nonfederal resource management/protection and conservation land uses constitute an additional 23 percent of the total County land area. Private development is limited to the western and central portions of the county. Residential uses account for nearly 30 percent of privately developed land in York County. Residential development, which consists mostly of single-family detached subdivisions, represents nearly 85 percent of the total developed land area in the County. The remaining 15 percent of developed land consists of commercial and industrial developments. Commercial uses have developed linearly along the major transportation routes adjacent to established residential areas. Industrial sites are mostly concentrated within industrial parks located in the lower portion of the County.

City of Williamsburg--The 3,297-acre City of Williamsburg constitutes approximately 2.4 percent of the total study area (Field Survey, Harland Bartholomew & Associates, Inc. for the Williamsburg Compre-

hensive Plan, August-October 1980, p. 40). Public and semi-public land uses account for nearly 40 percent of the City's land use. The second largest category is vacant land which accounts for over 20 percent of the total area. The third largest land use category is residential land occupying 19 percent of the City's land. The remaining 21 percent of total land area in Williamsburg consists of commercial enterprises, transportation networks, industrial plants, and water area.

4.2.2 Future Land Use

Long-term plans for the study area call for the continued trend toward urbanization that has occurred over the past decade. Growth in single-family residential and general commercial uses is expected by both area planners and developers. Tourist, commercial, and public/semi-public uses are expected to grow the least. This is due to the anticipated saturation of the tourist market in the area by the end of the 1980s and the anticipated stabilization of federal, state, and local government expansion.

James City County--James City County is expected to see the largest growth of the three localities by the year 2010. According to the County's Land Use Plan, both residential and commercial growth will be clustered in nodes, many of which will be mixed-use in character and planned in proximity to the Route 199 corridor, and which will remain within the "Primary Service Area," defined by Route 614 (Centerville Road). The present residential pattern of development will continue in this corridor, which some call the "residential heartland" of James City County. The planned communities of Kingsmill and Ford's Colony will be built-out by 2010. Increased multifamily development will appear as early as 1990, especially in the areas southwest of Williamsburg. It is highly probable, given market forces, that the large Warhill Tract, which extends from Route 60 west to Route 614 (Centerville Road), will be developed into a relatively high density, mixed-use development before the end of the century. The same is true of the vacant property surrounding Eastern State Hos-

pital. Within the next two years, the state plans to auction off much of the excess property surrounding the hospital.

County plans call for a limitation of water and sewer connections within the "Primary Service Area." Given the emergent popularity of slower County growth, it appears unlikely that this boundary will expand before the year 2010.

Public school enrollment is projected to increase steadily between 1985 and 1993, according to the James City County/Williamsburg School System (Superintendent's Office, James City County/City of Williamsburg School System, October 1985). School officials project that the existing elementary schools will reach enrollment capacity by 1988. They have, therefore, programmed construction of two new schools during the next two years.

York County--Long-range plans for the upper part of York County call for three major changes from the existing land use pattern: to concentrate tourist/commercial growth in the vicinity of Route 646 between the Interstate 64 and Route 60; to reserve more areas for multifamily uses in the area immediately north of Williamsburg; and to identify two major industrial areas, one at the intersection of Airport Road and Route 60 and the other along Penniman Road.

City of Williamsburg--Williamsburg has little room available for additional development (other than infill development). The exception is the 3.9 square mile area of James City County which is owned in large part by the Colonial Williamsburg Foundation and the College of William and Mary. This area was annexed effective January 1984. City officials visualize the annexed area as a major source of growth for the next several decades.

4.3 SOCIOECONOMICS

4.3.1 Population

James City County, York County, and the City of Williamsburg--A total of 41,235 persons resided in the study area in 1980 (U.S. Census, 1980). This represents a 17.8 percent increase over the 1970 total population of 35,004 persons. The most recently available state population estimate for the study area, according to the 1983 "Provisional Estimate" made by the Tayloe-Murphy Institute, is 43,990. The state projects a study area population of 47,103 in 1990 and 54,733 by 2010 (Virginia Department of Planning and Budget; Tayloe-Murphy Institute; Harland Bartholomew & Associates, Inc., 1985). It should be noted that, while York County and the City of Williamsburg do not dispute the Tayloe-Murphy Institute state population estimates and the State Department of Planning and Budget population projections for their areas, James City County disputes these agencies' projections as being consistently low.

4.3.2 Housing

A high degree of owner-occupancy exists throughout the Route 199 study area, although renter-occupancy is on the increase due to the increase in apartment construction, as well as to the continuing escalation of residential sales prices.

James City County--Sixty percent of the year-round housing units within the Route 199 study area are located in James City County. In 1980, roughly two-thirds of County housing units were owner-occupied. An unusually large proportion of housing units (10.4 percent) were classified as vacant in the 1980 Census, a figure which County planners claim to be in error (U.S. Census, 1980).

Since the early 1970s, the mix of housing types in the County has changed. In 1970, only 10.6 percent of the housing units available in the County were apartments. During the last decade, 22.5 percent of

all new units constructed were apartments, and by 1980, apartments accounted for 16 percent of available housing (U.S. Census, 1970 and 1980).

A significant aspect of the rapid suburban growth in James City County has been the increase in the average value of single-family dwelling units. In the spring of 1985, the average selling price for a new home in the County was over $90,000. This high value reflects the large percentage of the new housing constructed in the County to meet the demand from upper income home purchasers. The success of Kingsmill on the James and Windsor Forest illustrates this trend. In 1985, an estimated 10,900 dwelling units exist in the County ("Quarterly Population and Housing Unit Estimates," James City County, 1982-1985).

The high cost of homes in James City County has not, however, slowed the pace of construction relative to neighboring peninsula communities. During the past five years, only the City of Newport News has consistently constructed more single-family units within its borders than James City County.

York County--The 2,677 upper part of York County households accounted for nearly 20 percent of total study area households in 1980. Compared to James City County and Williamsburg, this part of York county has the highest percentage of owner occupancy. During the 1970s, the greatest increase in absolute numbers occurred in owner-occupied units which increased from 1,337 in 1970 to 1,957 in 1980. Renter-occupied units actually declined (U.S. Census, 1970 and 1980).

City of Williamsburg--Housing tenure relationships changed slightly between 1970 and 1980. Sixty-three percent of total year-round housing units were renter-occupied in 1980, a slight increase over 1970 figures, and renter-occupancy has increased since the census, due to increased apartment construction. Owner-occupancy declined slightly while the vacancy rate remained around 7 percent.

4.3.3 Income

Study area median household income in 1979 ranged from a low of $14,970 in the City of Williamsburg to a high of $22,141 in Upper York County (U.S. Census, 1980). Areas with the highest median household incomes were those which had received the greatest amount of in-migration during the late 1970s.

An examination of 1979 household income distribution reveals that a high proportion of James City County and Williamsburg households had annual incomes of less than $10,000. York County had the highest proportion of households, 45 percent, earning more than $25,000 per year in 1979 (U.S. Census, 1980).

4.3.4 Labor Force and Employment

Tourism, government, and manufacturing are the mainstays of the study area economy. The economy is highly dependent upon that of the Peninsula region as a whole because such a significant portion of the James City and York County residents out-commute to jobs in the Newport News-Hampton Roads area or, to a lesser extent, to jobs in the City of Williamsburg. The relative lack of nonresidential tax base in James City County and York County is a problem which influences the existing and future economic base.

In the Williamsburg area, tourism is a basic industry. A majority of visitors are from out of state, producing a net-inflow of revenue to the state and to the localities. It contributes just over half (58.3 percent) of the area's taxable retail sales. In 1981, tourists spent an estimated $179.4 million in the area, not including transportation expenses. Just over one-third was spent in James City County, $60.5 million, which represented 41.8 percent of the County's taxable sales. The combined area travel-generated jobs totaled 9,688 which generated a payroll of $63.2 million for Williamsburg and James City County in 1981, according to the Virginia State Travel Service. This does not include the indirect economic stimulus produced as these

direct-payroll dollars were spent in the local area. The depth of tourism in the area's economy makes specific delineation of its impact difficult. Undoubtedly, tourist dollars account for a large share of merchandise and food and beverage sales in general.

James City County--Much of the existing commercial and industrial development in James City County occurred during the late 1970s. Generally speaking, James City County employment is concentrated in the services, manufacturing, government, and retail trade sectors.

Employment tends to be concentrated in a small number of relatively large establishments. The major employer in the County during the months of October through May is Eastern State Hospital while Busch Gardens surpasses it during the June through September peak tourist season (Economic Base Study, 1980 Update to the Comprehensive Plan, James City County, p. 35; and "Evaluative Study of the Economy of James City County, Virginia," Ann Schwarz-Miller and Matthew Marlin, February 1985, and Harland Bartholomew & Associates, Inc., 1985). The County has seen relatively slow employment growth during the 1980s due to slow growth in the beer (Anheuser Busch and Ball Metal) and acrylic fibers (Badische) industries.

Area tourism declined sharply during the 1981-1982 recession, but has stabilized during the last year. Busch Gardens attendance has remained rather constant during the past several years. Aging of the population and oversaturation of the theme park market may even lead to decreased attendance in the future.

The Williamsburg Pottery Factory has experienced slow growth in the last two or three years and has not added new jobs since 1980. Major growth in retail sales and employment has occurred at the Outlet Mall nearby, which has benefitted not only from proximity to the Pottery, but also from regional prosperity and the existence of Sunday blue laws in Hampton and Newport News.

The prospects of high rates of growth, as seen in the 1970s, continuing in the James City County retail sector in the future are not great. The construction of a competing Pottery-type outlet in the Washington area by the South Carolina-based Waccamaw Pottery has posed a strong threat to the James City County outlets, which cater to busloads of shoppers from out-of-state. Further, the construction of a K-Mart Shopping Center on the Williamsburg-York County border has begun to siphon-off some of the business of lower Peninsula-area shoppers.

Individuals who live in James City County and commute to work in neighboring communities are potential contributors to the County's economic base. This income indirectly stimulates and enhances economic growth. While other communities gain tax revenues from business property, James City County gains the residential tax base. Although revenues from the two sources may be comparable, it is the "bedroom community" which bears the responsibility of education expenditures, the major expenditure category for local governments nationwide.

A 1980 County survey found that only 37 percent of employed James City County residents worked in the County while 40 percent held jobs in Williamsburg, 11 percent in Hampton and Newport News, and 6 percent in York County. Colonial Williamsburg Foundation employs the most County residents in absolute numbers, followed closely by the federal government.

This "bedroom community" affect is compounded by a lack of retail, personal, and business-related services (groceries, medical, legal, etc.) in James City County. The greater density of adjacent jurisdictions, most notably the City of Williamsburg, has resulted in "leakages" of retail expenditures made by County residents outside of the County. This comparatively slow growth in the services sector (with the exception of tourism) limits the potential growth in the County's nonresidential tax base.

York County--Similar to James City County, the upper part of York County functions largely as a "bedroom community" and has a low nonresidential tax base relative to the larger Peninsula localities. Most employment opportunities, other than military employment, presently found within the County provide support services for local residents. Concentrations of employment have existed in the past and are expected to continue to exist in the government, wholesale and retail trade, and construction sectors of the County economy.

The upper part of York County commercial employment differs significantly from that of the lower part of the County. Commercial activity is impacted heavily by tourists. As in the case of James City County, "leakage" of retail expenditures to the City of Williamsburg is a problem, but to a lesser extent since several retail centers exist in York County, adjacent to the City. This problem of low nonresidential tax base is compounded in York County by the large resident military population: the large military land holdings in the upper county reduce the number of prime commercial and industrial sites; and military personnel stationed there tend to make retail and services related expenditures at military exchanges, thereby reducing demand for such facilities.

City of Williamsburg--The service sector dominates the economy of Williamsburg. Both tourist and retail trade are basic or "export" industries which largely serve the neighboring jurisdictions of James City and York Counties. Therefore, the City's economy is highly dependent upon the expenditures of County residents, as well as of tourists.

The College of William and Mary exhibits the major student enrollment for the entire study area and employs a large number of professional and support personnel.

The Colonial Williamsburg Foundation is the largest employer in the study area. Hotel and restaurant businesses provide spin-off employment.

4.4 COMMUNITY FACILITIES AND SERVICES

4.4.1 Neighborhood Cohesion

James City County--Single-family detached residential development is situated in a crescent-shaped area around the City of Williamsburg and along corridors south toward Grove and north toward Toano.

Upper York County--Over the past 20 years, new residential development in the upper portion of York County has been concentrated in small single-family detached subdivisions in the Queen's Lake Area and in the area north of Penniman Road and south of I-64, between the Colonial Parkway and Route 199. Some additional residential uses exist in the vicinity of Route 646 north of I-64. The small amount of multifamily residential use is limited to the area immediately northeast of the City of Williamsburg. Neighborhood commercial activities exist near the Country Club Acres, Schenck Estates and at the Queen's Creek/Penniman Road intersection and the Route 60/Lightfoot intersection. Larger, generally commercial uses extend along Route 143 from Penniman Road to the Williamsburg City line. These centers include James York Plaza, Be-Lo, Farm Fresh Shopping Center and the new K-Mart Shopping Center.

City of Williamsburg--Land uses in Williamsburg are fragmented, with clustered and stripped development separated by wedges of vacant land. The central area is Colonial Williamsburg. The restored area includes occupied single-family residences and popular commercial establishments. Surrounding the restored area are city and university buildings which radiate outward along Route 60 to the northwest and southeast, Capital Landing Road to the north, and Jamestown and Monticello Roads to the southwest.

The City of Williamsburg provides the focal point for commercial uses in James City and York Counties. Major commercial shopping centers are located along Route 60 in the northwest and northeast sectors. Tourist commercial uses are interspersed with general commercial

uses along Routes 60 and 143. Merchants' Square, which is adjacent to the restored area, is oriented entirely to tourist shopping.

4.4.2 Emergency Services

Three fire stations are located within James City County: Grove Station, the Central Station on Route 5 and the Old Towne Road Station. Emergency medical services are provided at each of these. The Toano station remains as a volunteer facility. The primary goal of the County Fire Department is to have at least 90 percent of County development within 4 miles of a fire station, a goal which has become increasingly difficult to meet. James City County officials have expressed the need for access for emergency vehicles from the Old Towne Road Fire Station to Route 199 if Alignment A is selected.

4.4.3 Institutions

James City County--Approximately six percent of the developed land use in James City County is institutional development. ("Evaluation of Land Uses and Zoning Districts," Working Paper #4, James City County, November 1982, p. 4.) The Colonial Williamsburg Foundation and Eastern State Hospital account for the largest public land holdings within the County. The Colonial Williamsburg Foundation owns approximately 4,000 acres in Williamsburg, James City and Upper York Counties. The State owns approximately 360 acres in and around Eastern State Hospital, which is situated in the geographic center of the County.

James City County has the largest proportionate share of community facilities in the study area. Most of these facilities are located in the more densely populated Williamsburg area. The municipal center lies adjacent to Kingsmill, while the courts, jail and library are operated jointly with the City of Williamsburg and are located there.

The County and City of Williamsburg operate the only consolidated school system in the state. Out of the seven existing schools, five are

located in James City County (Public Facilities, 1981 Update to the Comprehensive Plan, James City County; James City County/City of Williamsburg School System, Superintendent's Office, October 1985), where approximately 80 percent of the enrolled students reside. The highest enrollment ever was recorded in September 1985.

York County--Institutional facilities are located in lower York County where the population is concentrated.

City of Williamsburg--Major institutions, federal, watershed, churches, cemeteries, and other institutional development comprise 1,031.5 acres or 31.3 percent of the total City land area.

4.4.4 Parks, Recreation, and Open Space

James City County--James City County community recreational facilities lie in the more densely populated Williamsburg area and two major parks are located on Ironbound Road and Leisure Road.

A new County Social Services facility opened in 1985 off Strawberry Plains Road and a new County Community Center opened in mid-1985 on Old Towne Road, across from the fire station. Both of these facilities were sited for the central location and for the future proximity to planned Route 199. Approximately 88 percent or 85,263 acres of the County consists of open and reserved land.

York County--According to the County's 1983 Land Use Plan, agricultural activities contribute more to the perception of a rural atmosphere than they do to the County's economic base. The estimated six percent of the County's net land area which is currently in commercially productive agricultural activity is concentrated in the Lightfoot and Skimino areas. The majority of the County Park/Conservation Area is located in the lower part of the county. Vacant land in the upper county area is located on the western side in areas zoned for either residential or tourist commercial uses.

City of Williamsburg--Approximately 689 acres or 21 percent of Williamsburg is vacant land. Colonial Williamsburg has preserved open spaces around the restored area and in the vicinity of the Information Center and the visitor facilities south of the restored area. At the headwaters of Queen's Creek, the City owns the Waller Mill Reservoir and a substantial portion of its watershed. In September 1985, the City of Williamsburg bought the former Airport property owned by the College. The City plans to leave this 210-acre site undeveloped to preserve the Reservoir watershed. Combined with Camp Peary in York County, this area comprises a large undeveloped area north of the City. The 85-acre Colonial Williamsburg Golf Course is a major recreational facility within the City. Parks and playgrounds comprise 57.5 acres of the City's land surface area. Colonial Williamsburg, one of the most prominent of all historic localities in the County, is a resort area for thousands of tourists annually.

4.5 CONSERVATION

4.5.1 Agricultural Lands

Approximately 3.5 percent of the land in the study area is presently in cultivation. Typical crops raised include soybean and barley. A minor land use component of the study area is pasture land. Improved pasture is utilized primarily by dairy cows and horses. Vegetation in these areas consists of planted forage species which may also support a variety of fauna such as mice and other rodents.

Pursuant to the Farmland Protection Act, a Farmland Conversion Rating was coordinated between the VDOT and the Soil Conservation Service (SCS). Acreages determined by the SCS to be of prime and unique farmland impacted by Alignments A, A-1, A-2, Revised Line A and D are respectively, 8.5, 7.5, 10.0, 9.6, and 4.8. Statewide or locally important farmland converted for Alignments A, A-1, A-2, Revised Line A, and D are 6.8, 6.6, 7.4, 7.6, and 9.1 acres respectively. The total acreage of farmland affected by the selected alternative, Revised Line A, is 28 acres.

Alignments A-1 and A-2 impact 26.0 acres and 27.0 acres, respectively. In response to the SCS site assessment and rating results, minor shifts in the proposed road alignment may be considered during the final design to minimize impacts to farmland.

4.5.2 Forests

The study area contains over 5,000 acres of wooded tracts or fragments encroached to varying degrees by development (Figure 4-5). Upland forests are characterized by a canopy of deciduous, broad-leaved trees dominated by white oak (Quercus alba), beech (Fagus grandifolia), and tulip tree (Liriodendron tulipifera). Loblolly and short leaf pines (Pinus taeda and P. echinata) are well represented in some areas. Secondary tree species include hickories (Carya spp.), sweet gum (Liquidambar styraciflua), elm (Ulmus spp.), holly (Ilex spp.) and other oak species (Quercus spp.). Understory vegetation ranges from very sparse to dense with the principal species consisting of huckleberries (Gaylussacia spp.), blueberries (Vaccinium spp.), chestnut (Castanea spp.) and sapling arboreal species. Ground cover is provided by Christmas fern (Polystichum acrostichoides), partridgeberry (Mitchella repens), wild grape (Vitis spp.), and Virginia creeper (Parthenocissus quiquefolia), Upland areas also include cutover areas which consist of recently cut forest, roadsides, transmission corridors and woodland edges. The flora of cutover areas consists of ruderal and early successional species typical of disturbed habitats.

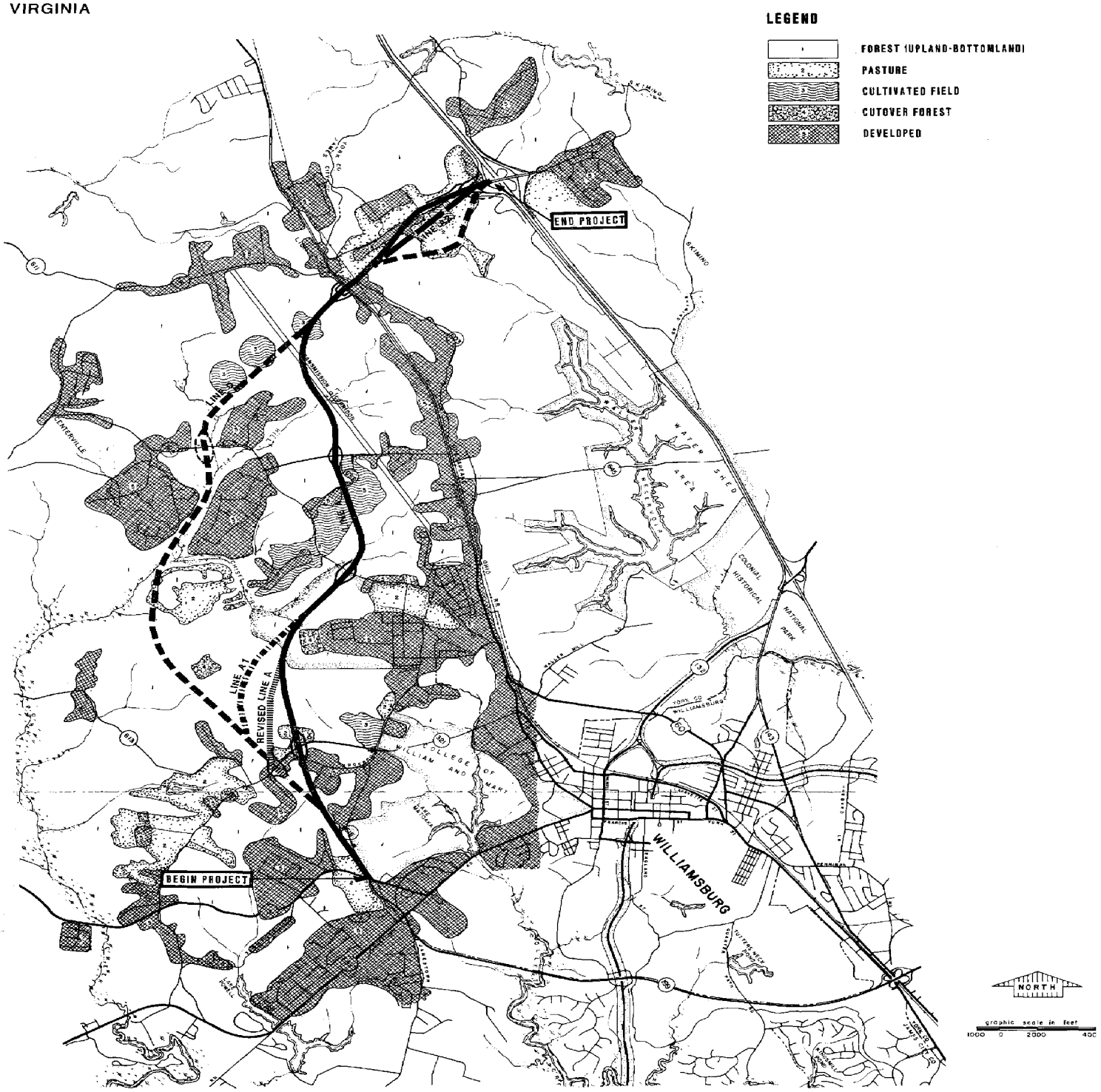
Lowland forests are also common within the study corridor. Dominant tree species found in the study area include red maple (Acer rubrum), sweetgum (L. styraciflua), tulip tree (L. tulipifera), sycamore (Platanus occidentalis) and green ash (Fraxinus pensylvanica). The shrub layer is dominated by spicebush (Lindera benzoin), ironwood (Carpinus caroliniana), and pawpaw (Asimina spp.), with numerous vines including greenbriar (Smilax spp.), and trumpet creeper (Campsis radicans). Herbaceous communities include lizard's tail (Sarurus cernuus), jack-in-the-pulpit (Arisaema atrorubens) and numerous fern species.

FIGURE 4-5

HABITAT TYPES / DEVELOPED AREAS

ROUTE 199 CORRIDOR

JAMES CITY AND YORK COUNTIES
VIRGINIA



4.5.3 Terrestrial Wildlife and Habitat

The forests and other terrestrial/wetland habitats in the study area support a diversity of organisms. White-tail deer (Odocoileus virginarus) are known to frequent the woods, cutover forest and open areas. Upland woods with sufficiently dense understory are known to support wildlife such as red fox (Vulpes vulpes), gray fox (Urocyon cinereoargenteus), raccoon (Procyon lotor) and opossum (Didelphius virginiana). Woodlands which are interspersed with old fields or overgrown lots attract species such as the striped skunk (Mephitis mephitis), woodchuck (Marmota monax), rabbit (Sylvilagus spp.), eastern gray squirrel (Sciurus carolinensis), and a variety of perching birds or songbirds such as robins (Turdus migratorius), blue jays (Cyancitta cristata), thrushes (Catharus spp.), hairy woodpeckers (Picoides villosus), vireos (Vireo gilvus), warblers (Dendroica spp.), field sparrows (Spizella pusilla) and many other resident and migrating species including game birds. Osprey (Pandion haliaetus) sightings have also been reported in the study area. Fauna identified in the wetlands section includes many species of birds, reptiles and amphibians. The spotted turtle (Clemmys guttata) was found to exist in the wetlands associated with the study area.

4.5.4 Threatened and Endangered Species

One plant species federally listed as endangered is known to occur in the study area: the small-whorled pogonia (Isotria medeoloides). A single known population exists approximately 90 feet from the proposed right-of-way of Alignment A. It currently consists of approximately 120 individual plants making it the largest known colony south of New England. Two plant species of concern are also known to occur in the study area. These species are currently considered Category 2 candidate species by the U.S. Fish and Wildlife Service. A Section 7 biological assessment has been conducted to determine the effects of Revised Line A on this species. One population of the New Jersey rush (Juncus caesariensis) is located in the Mill Creek area south of Route

615. It is not believed to be impacted by either of the primary alignments. The dwarf trillium (Trillium pusillum var. virginianum) which is considered a Category 2 species occurs at several locations in the drainages of Mill Creek, Chisel Run Creek, and Long Hill Swamp. Only Alignment D will potentially cause an adverse impact to two of the existing populations in Long Hill Swamp. No other alignment causes a threat to any known populations.

4.6 CULTURAL RESOURCES

4.6.1 Architectural Resources

Literature search, field survey and coordination with the Virginia Division of Historic Landmarks (VDHL) were utilized to assess the effects of the proposed Route 199 upgrading on the architectural resources in the project area.

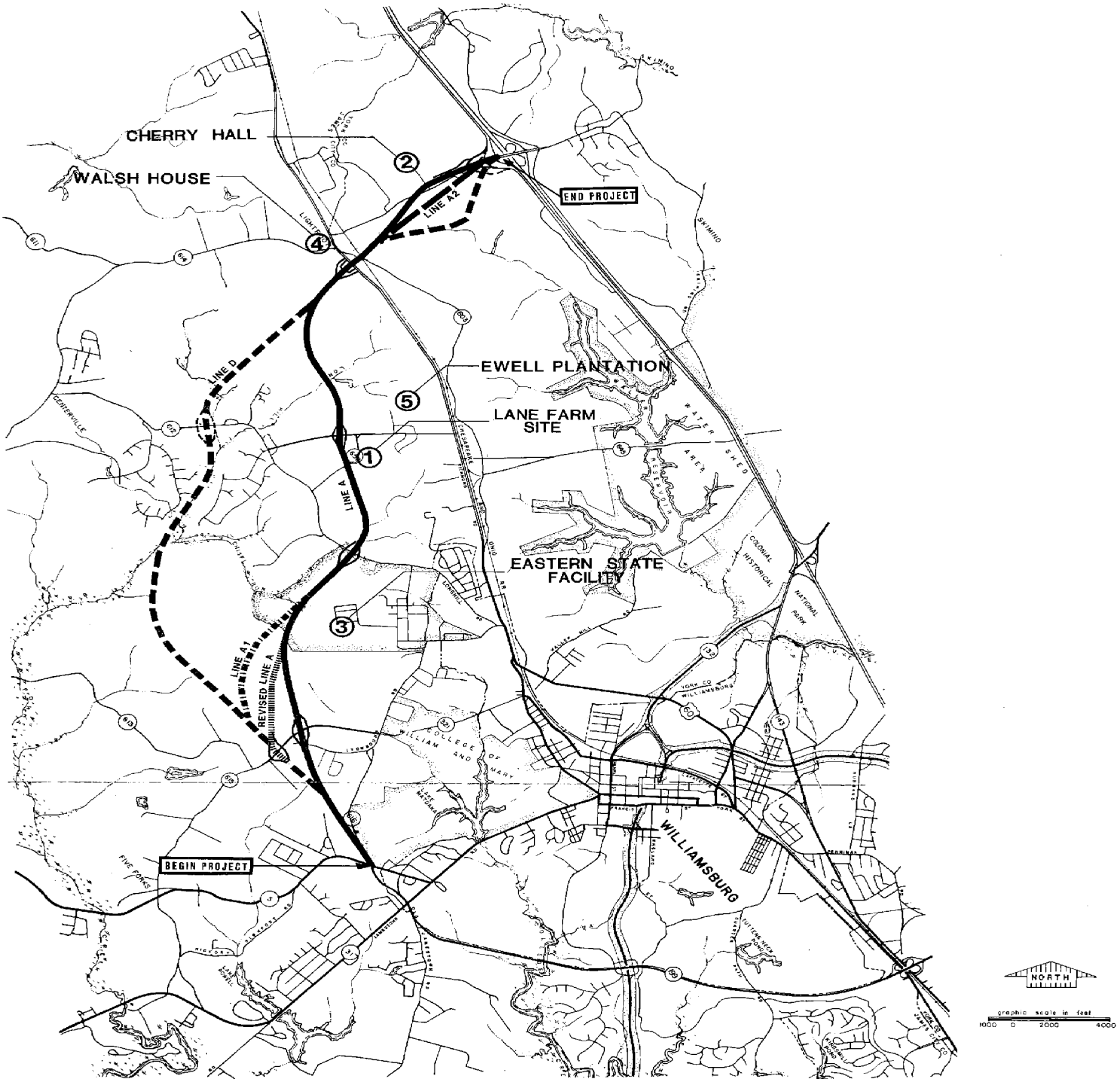
The general area surrounding the proposed road alignments is rural. Because Alignment D follows the streambeds, very few architectural resources of any period are found in this area. Five potentially significant structures were identified within one mile of the proposed alignments, four being associated most closely with Alignment A and one to the section of roadway common to both Alignment A and D in the vicinity of Route 60. See Figure 4-6 for general site locations.

The Lane Farm, located 100 feet east of the proposed Alignments A, A-1, A-2, and Revised Line A was built after the Civil War by Captain L. W. Lane. The house is of frame construction on brick piers which were later filled in with a solid foundation. The house began as a side hall structure with one room on the first floor and one above. Later additions include a wing at the rear of the structure and a larger two story addition to the west which retains the stair in the original section as the only stair leading to the second floor. An early outbuilding stands 20 feet east of the house and two large barns built in the mid 19th century are located north of the house. The farmhouse is only slightly visible from Old Towne Road and is overgrown and in a

FIGURE 4-6

POTENTIALLY SIGNIFICANT ARCHITECTURAL SITES
ROUTE 199 CORRIDOR

JAMES CITY AND YORK COUNTIES
VIRGINIA



dilapidated condition. The two barns north of the house are partially overgrown and also in poor condition. They are being used as open storage sheds.

The VDHL archives include a survey of the Lane Farm site. This survey states that there is little interest in this Post-Civil War structure. According to the State Historic Preservation Officer, the Lane Farm site is not eligible for listing on the National Register of Historic Places. A letter stating VDHL concurrence with this finding is in Appendix C of this document.

Cherry Hall, 950 feet north of the proposed Alignment A on Route 646, dates back at least to the 1840s and possibly earlier. It is of brick construction with two and one-half stories and a basement. The roof is gabled with two dormers and an end chimney. A porch has been added to the federal style structure. From the exterior, the house appears to be in good condition and is presently occupied. The 1985 report Towards a Resource Protection Process by the Colonial Williamsburg Foundation lists Cherry Hall as a structure which is eligible for nomination to the National Register of Historic Places. This structure will not be affected by the selected alignment, Revised Line A.

A two-story brick house was identified in the southwest portion of the Eastern State Hospital grounds, over 200 feet east of the proposed Alignment A. This structure, built in the federal style, is presently being used for an off-campus program called "Turning Point." It is not listed on the National Register of Historic Places and will not be affected by the selected alignment, Revised Line A.

The Walsh House is located on Route 60 west of the Route 646/Route 60 intersection. It is located approximately 2,000 feet from the proposed intersection of Route 199 and Route 60. It is a one-and-one-half story frame construction clapboard house with a gable roof and dormers and an attached two-story clapboard sidewing. The structure dates to the mid 19th century and has several wooden outbuildings associated with it. Although it may be eligible for listing,

it is not presently listed on the National Register of Historic Places, and will not be affected by the selected alignment, Revised Line A.

The Ewell Plantation is a two-story frame construction residence with a hip roof which dates to 1845. It is located three miles northwest of Williamsburg on Route 60. It is approximately 2,800 feet east of proposed Alignment A. Notable features include octagonal posts and a two-story porch. During the Civil War, this house was said to have served as a headquarters for General Sherman. The original owner, Colonel Ewell was associated with the College of William and Mary. Although the structure may be eligible, it is not presently listed on the National Register of Historic Places and will not be affected by the selected alternative.

4.6.2 Archaeological Resources

A Phase I Reconnaissance Survey of the archaeological resources in the project area was conducted in compliance with the National Historic Preservation Act of 1966. The research included a review of historic and archival records and a field inspection of Alternative A (including A-1 and A-2) and Alternative D. The purpose of the survey was to provide information on probable locations of sites that might be affected by the proposed project. The results of the survey indicated that construction could have considerable impact on a number of important prehistoric and historic-period archaeological resources (see Figure 4-7).

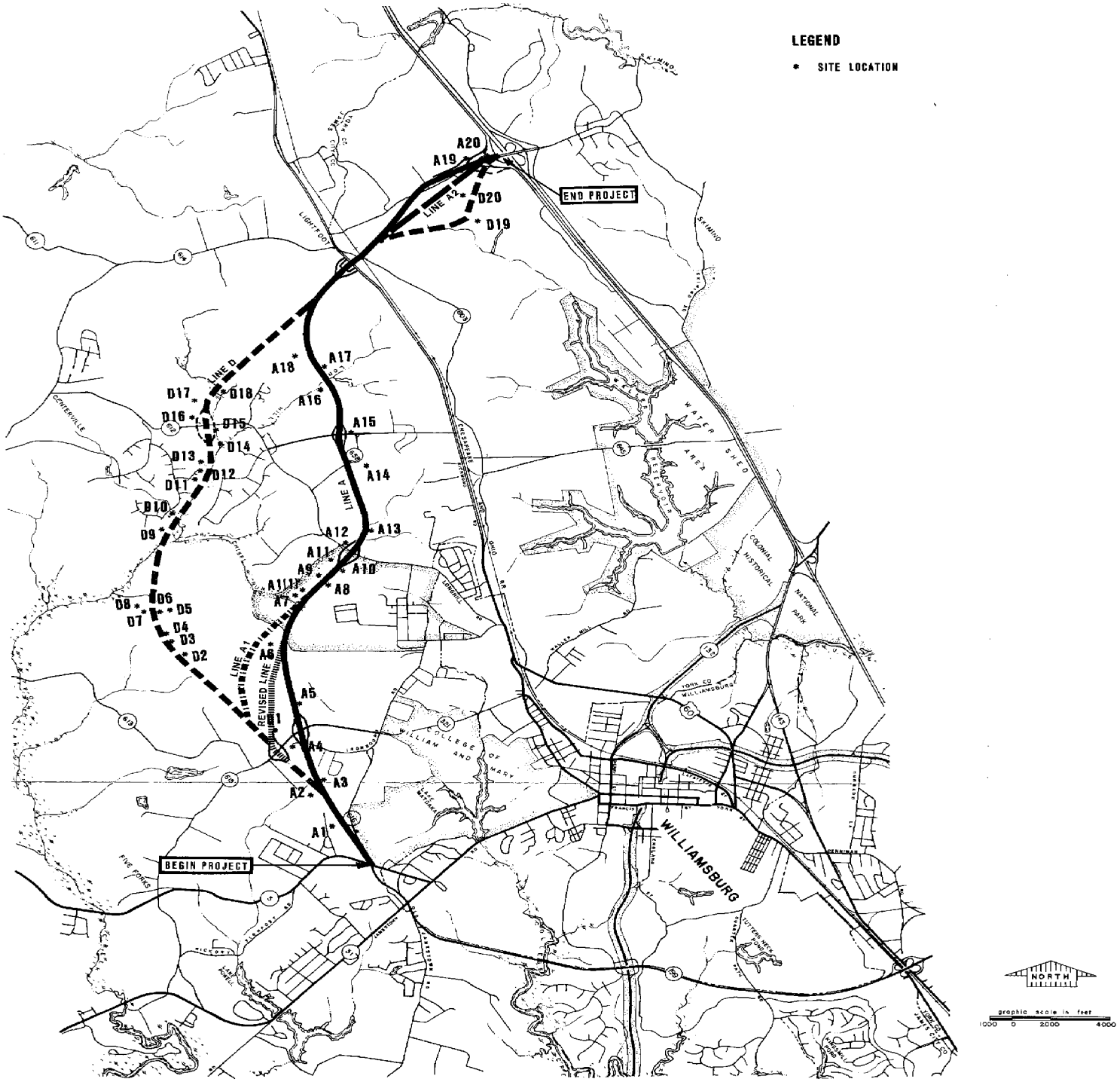
The results of this survey are reported in detail in the Cultural Resources Technical Report which was prepared as part of this environmental impact statement. This report is summarized below.

The environment of the project area is diverse, varying considerably in terrain and natural resources. The broad upland areas offer large tracts of harvestable timber, good agricultural soils, and topography suitable for settlement and road systems. The low stream bottoms provide an extremely rich resource base in terms of animal and plant

FIGURE 4-7

ARCHAEOLOGICAL SITES
ROUTE 199 CORRIDOR

JAMES CITY AND YORK COUNTIES
VIRGINIA



species available for hunting, fishing, and gathering. Such locations are known to have attracted prehistoric groups in other areas. The upland freshwater stream and swamp areas contrast significantly with the estuarine environments of the tidal portions of these watercourses in terms of resource diversity, availability, and navigability.

A total of 33 archaeological sites were located within, or immediately adjacent to, the project corridor. See Figure 4-9 for site locations. In addition to the 33 sites recommended for Phase II evaluation, eight areas were designated as potential site locations, but will require additional research before being confirmed as having archaeological site status. The VDHL concurs with these findings as indicated in the letter included as Appendix A of this document. The large number of sites found was somewhat unexpected in view of the negative results produced by previous surveys. Given the locational models constructed from historical and prehistoric background research, many of the sites were anticipated in advance; however, the site density, particularly for prehistoric sites, was surprisingly high.

The survey strategy emphasized the documentation of the presence or absence of archaeological resources within the project area. Because the testing was of a limited nature and since most sites were discovered through shovel testing, the findings represent tentative statements of site size, preservation, and cultural affiliation. The actual relationships between site boundaries and the limits of the proposed right-of-way will require clarification during the next phase of work.

The prehistoric sites are situated on the terraces, knolls, and necks of land adjacent to Long Hill Swamp, Powhatan Creek, Chisel Run and their tributaries. No prehistoric materials were revealed in the high, flat areas away from the edges of terraces. All sites were located in wooded areas, the majority of which have never been plowed. The only evidence of previous disturbances was in the form of sewer lines, which had truncated portions of several sites, and tree falls. Several intact features, including hearths and pits, were encountered, indi-

cating a high level of site integrity for the resources within the project area. Most sites are in shallow to deep colluvial deposits.

The prehistoric sites range from the Late Archaic Period to the Late Woodland Period. The majority of sites, however, can be attributed to the Middle Woodland Period, approximately 500 B.C. to A.D. 900. The site patterning for the area is similar to the patterns exhibited elsewhere in the Coastal Plain (Mouer et. al. 1980). No attributable materials from the Paleo-Indian Period or the Early and Middle Archaic Periods were found, though more extensive testing might be necessary before conclusive statements can be made about the representation of these cultural episodes. Particular attention should be paid to whether the lack of remains from those earlier periods reflects the later development of the upland swamps or whether subsequent environmental changes have masked the presence of such sites.

Two general site types emerged from the testing. The largest and most diversified sites appear on low terraces at the confluences of the major branches of the aforementioned streams. These sites were designated complex activity sites and probably represent a series of foray encampments exploiting the diverse plant and animal resources of the interior zones. Smaller and less diversified sites, designated as limited activity sites, were encountered on the small rises along the streams, usually adjacent to springheads.

One of the primary objectives in identification of historic sites within the project corridor was the close examination of all features related to land utilization and resource exploitation during the past three centuries. While certain features which were indicative of and often directly associated with domestic site occupations were carefully noted, features related to transportation, logging and milling were also identified. Historic maps such as the Pechon Map (1781), J. F. Gilmer Map (1863), and the 1906 edition of the U.S.G.S. Williamsburg Quadrangle Map provided primary insight into both domestic site and historic road locations. This information, combined with field recon-

naissance, permitted a limited and tentative reconstruction of development within the immediate project area.

A very important class of landscape features, in the form of well-preserved early roads and corresponding fencelines, exists throughout the project area. Site 44JC127, previously recorded as a zig-zag earthwork, was found to be a small portion of the extensive remains of split-rail worm fences. The physical remnants of these fencelines, which flanked both sides of the roads, resulted from soils accumulation over many years, attesting to the duration and popularity of this style of Virginia fencing. Many examples can be found in 18th and 19th-century literature citing the significance of such fence systems in the cultural landscape.

Alternative A (including A-1, A-2 and Revised Line A)--Nineteen sensitive archaeological areas were identified within the proposed impact zone of this alternative which were studied in a Phase II Evaluation. In general, the project area was found to have a high density of prehistoric occupation and produced a wide range of prehistoric ceramic types. These prehistoric sites appear to date from the Late Archaic Period (2000 B.C.) to the Late Woodland Period (1000 A.D.). The majority of prehistoric sites, however, have been attributed to the Middle Woodland Period, approximately 500 B.C. to 1000 A.D.

The Phase II evaluation of the prehistoric resources within the proposed project corridor has resulted in the identification of six prehistoric sites deemed eligible for nomination to the National Register of Historic Places. Of these six sites, five are threatened by the proposed project. Site A-11 is outside of the right-of-way and should be avoided during construction. The five sites recommended for Phase III data recovery are:

A-8 - Prehistoric site
A-12 - Prehistoric site
A-13 - Prehistoric site

A-16 - Prehistoric site

A-17 - Prehistoric site

The prehistoric resources within the project corridor afford an unprecedented opportunity to understand a previously-neglected aspect of the cultural development of the James-York peninsula and surrounding regions. Phase II site examination has documented the presence of stratified deposits, hearths, possibly storage features, limited organic preservation, and horizontal separation of functional activities. Preliminary analysis of these sites indicate that they represent the remains of seasonally-occupied resource procurement sites with components ranging from the Late Archaic period (2000-1200 B. C.) to the Late Woodland period (A.D. 900-1600). The preliminary data also suggest that the interior areas of this portion of the James-York peninsula were most intensively utilized during the Middle Woodland period (500 B.C.-900 A.D.).

Phase III study will focus on further site-specific research, in an effort to understand the range of diversity of habitat and adaptive strategies within the naturally-defined settlement systems of the Chisel Run/Long Hill Creek drainages. These goals include the accurate definition of site content and structure, the delineation of occupational episodes, and the further refinement of estimates of the site age and site function. The classes of data required to meet these goals can be recovered through a combination of controlled block excavation and close-interval testing. Based on anticipated results of site-specific research, some alternative hypotheses are offered concerning the subsistence-settlement patterns that emerged within the type of drainage system represented by Powhatan Creek and its tributaries, Chisel Run and Long Hill Creek. The problem of how these drainage-specific patterns on the Peninsula relate to overall regional patterns linking the interior and outer portions of the Virginia coastal plain is also addressed.

Eighteenth and nineteenth century house sites and a water-powered mill site were also discovered. Many of these sites may yield archaeological data important for characterizing land utilization, and resource exploitation in the project area. The historic-period sites are located on the high, flat ground along historic roads and could suffer direct impacts from construction. These sites may be eligible for nomination to the National Register and have been studied in a Phase II Evaluation.

Although eight historic-period sites were examined as part of the Phase II evaluation study, only one was found to contain classes of archaeological data whose research potential and integrity qualified it for eligibility to the National Register of Historic Places. The preservation plans recently prepared for James City County and other Peninsula jurisdictions draw attention to the need for more intensive study of these sites, as they have been largely ignored in the scholarship and preservation efforts undertaken thus far within this area (Brown and Bragdon 1986). Nevertheless, archaeological manifestations of this property type within the Route 199 corridor proved to be either lacking in integrity and substance, or fell outside of the right-of-way. Although one surviving structure from the early nineteenth century, the Lane farmhouse, should be properly recorded before demolition, no other resource within the right-of-way associated with nineteenth- and early twentieth-century agricultural settlement requires further work.

The one historic site that has been considered eligible for inclusion on the National Register, site A-3, contains the remains of an mid-eighteenth-century milling operation that may be associated with the production and processing of indigo. Only a handful of mills known to have been in use prior to 1800 have been recorded in James City and York Counties. The possibility that this site may represent the physical remains of an indigo-processing mill, originally located on

the Rich Neck tract of Philip Ludwell's Greensprings plantation, makes it even more unusual and worthy of careful recording and analysis.

This mill site may provide physical evidence of the overall layout and organization of the milling process used in producing indigo. Although documentary sources confirm the presence of such operations during this period, no site of its kind has yet been identified or investigated archaeologically on the James-York peninsula or within Virginia Tidewater area. Further study of the documentary record concerning the cultivation and processing of indigo, together with analysis of surviving period illustrations, will provide a basis for identifying and interpreting the site's features, including a mortar spread, postholes, and nail concentrations. In addition, there are water-containment features visible on the site. It is known that control of water was important to both the cultivation and processing of indigo. Period accounts also emphasize the importance of locating processing stations near the fields where the indigo plant was grown.

Phase III work should therefore focus on clarifying the function of these features, and recreating their overall layout. Special effort should be made to confirm the presence of the kinds of facilities known to have been used in indigo-processing. These include sheds for drying the plant, vats for fermenting and collecting the indigo, and mills for crusing the plant into the precipitate known as "indigo mud." It was this precipitate, in the form of cakes, that was retailed. Among the categories of relevant data will be archaeological evidence of the chemical precipitates formed in the course of settling and fermenting the indigo. The presence of these precipitates may be detected through appropriate chemical analysis of soil samples taken from the site.

Alternative D--Seventeen sensitive archaeological areas warranted Phase II Evaluation studies within the impact zone of proposed Alternative D. The density of prehistoric remains was especially high within this portion of the project area. Most of the sites within this alternative are small, well-preserved prehistoric sites of the Middle Woodland Period (500 B.C. to 1000 A.D.), which occur along the margins of Powhatan Creek and Long Hill Swamp. These sites are potentially eligible for inclusion in the National Register and could be directly impacted by proposed construction. In addition, a small family cemetery, dating to the early 20th century, could be disturbed by construction.

4.7 AIR QUALITY

Analysis of air quality impacts is a major consideration in evaluating a proposed transportation project. The primary objective is to examine whether any of the proposed alternatives have potential for violating the air quality standards and whether any of the proposed alternatives will interfere with the State Implementation Plan (SIP) for attainment and maintenance of the air quality standards.

An air quality analysis study was performed pursuant to Air Quality Conformity and Priority Procedures for Use in Federal-Aid Highway and Federally Funded Transit Programs, 23 CFR 770 of the Federal Register.

Under the Clean Air Act (CAA) of 1970, the U.S. Environmental Protection Agency (EPA) was empowered to establish National Ambient Air Quality Standards (NAAQS) which established maximum allowable levels for various air pollutants. States are required to submit an SIP for the attainment and maintenance of these standards to be achieved at the earliest date commensurate with technological and economic feasibility. The Virginia Air Pollution Control Board (VAPCB) under the provisions of the Air Pollution Control Law of Virginia, has adopted the NAAQS as the State standards.

The Commonwealth of Virginia is divided into seven Air Quality Control Regions (ACQR). The proposed project is located in the Hampton Roads

AQCR. In compliance with the Clean Air Act as amended in August 1977, this region has been designated as an attainment area for all criteria pollutants.

4.8 NOISE

4.8.1 Introduction

On federally funded highway projects, the Federal Highway Administration (FHWA) requires that highway noise impact be assessed according to guidelines published in Volume 7, Chapter 7, Section 3 of the Federal-aid Highway Program Manual (FHPM 7-7-3). This noise analysis evaluates the noise impacts of the proposed project and considers possible abatement measures, in accordance with these guidelines.

FHPM 7-7-3 specifies that sound levels shall be given in decibels (dB), a logarithmic scale for measuring sound pressure levels. One decibel represents roughly the smallest change in loudness that can be perceived by the human ear. Also, an increase of 10 dB(A) corresponds to a doubling of loudness.

Because the human ear is most sensitive to frequencies in the middle and upper audible range, these frequencies must be given greater weight than others in averaging sound contributions from all audible frequency bands to arrive at a total noise level value. Sound level values adjusted in this manner are designated "A-weighted." Sound levels measured in decibels and A-weighted are denoted dB(A).

The FHWA Highway Traffic Noise Prediction Model describes traffic noise in terms of L_{eq} sound levels measured in dB(A) units. During a given period of time, the varying sound levels which occur are associated with varying amounts of energy. If all of those energies were added together, the result would be the total energy generated during that period of time. For illustration purposes, call that total energy "X." The L_{eq} (equivalent sound level) for that time period is defined to be the sound level which would generate X amount of

energy if it occurred constantly during that given time period. To summarize, the total energy associated with the L_{eq} sound level, if it is constant over a period of time, is equivalent to the total amount of energy associated with the varying sound levels actually occurring during that period of time. Unless otherwise noted, the time period under study is the period of peak traffic noise, usually peak, or rush hour. All sound levels given in this study are L_{eq} values measured on the dB(A) scale.

Noise levels in the project area were determined for the existing conditions, the design year No Build conditions and the design year build conditions. The design year is a future year, 2010, chosen for comparison with the present time. The design year No Build noise levels are the noise levels occurring in the design year if the proposed project is not constructed. Noise levels which will occur in the design year, if the proposed project is constructed, are design year build noise levels.

In order to determine the degree of impact of traffic noise on human activity, the Noise Abatement Criteria (NAC) established by FHPM 7-7-3 are used. These criteria represent the upper limit of acceptable traffic noise level conditions and also represent a balancing of that which may be desirable and that which may be achievable. The NAC is illustrated in Table 4-8.

The Noise Abatement Criteria apply only to areas having regular human use, and where lowered noise levels are desirable. These criteria do not apply to the entire tract of land on which the activity is based, but only to that portion where the activity occurs.

When the predicted design year build noise levels in the project area approach the NAC or are substantially higher than existing levels, the Department must consider implementation of measures to reduce the traffic noise. If it is found that such mitigation measures will cause adverse social, economic, or environmental effects which outweigh the benefits received, the highway agency may dismiss them from consideration.

Table 4-8
Noise Abatement Criteria
Hourly A-Weighted Sound Level - Decibels dB(A)

Activity Category	Leq(h)	Description of Activity Category
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (Exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 (Exterior)	Developed lands, properties, or activities not included in Categories A or B above.
D	--	Undeveloped lands.
E	52 (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

Source: U.S. Dept. of Transportation, FHWA, 1982.

4.8.2 Existing Conditions

The existing noise environment in the vicinity of the proposed Route 199-Williamsburg Bypass project and its possible alternatives (A, A-1, A-2, Revised Line A and D) is typical of a rural suburban community. Motor vehicles along Interstate 64 and Route 60, and other rural-type roads are the major intrusive sources of noise. Presently, forest land predominates the project area. Other land uses include agricultural, residential, commercial, and public/semi-public.

4.8.3 Noise Receptor Locations

Noise sensitive areas along the proposed Route 199 consist of residential areas, the Eastern State Hospital, Lafayette High School, and several churches. Figures 4-8 to 4-10 illustrate 41 sites in the project area that were selected for noise analysis on the basis of the following criteria:

- Noise sensitivity
- Anticipated impact from one or more project alternatives
- Representation of other sites with similar characteristics
- Degree of coverage of the study area

A brief description of these sites is presented in Tables 4-9 to 4-11.

4.8.4 Existing Noise Levels

Noise measurements were taken during daylight hours in the week of December 2-6, 1985, using a GENRAD GR 1988 Integrating Sound Level Meter and Analyzer (Type 1). The "A-weighted" frequency scale was used, with a normal sensitive 50 mV/Pa microphone (with windscreen) attached to the meter. The meter was calibrated before and after each site measurement with a GENRAD Type 1562 Sound Level Calibrator at 114 dB sound pressure level for 60 seconds. The meter was tripod-mounted at 4½ feet above the ground, and connected to a printer. In areas where there was no dominant noise source, the

Table 4-9
Site and Study Area Locations
Alignment A

Site No.	Location	Areas Represented	Distance from centerline of proposed Route 199 (Estimated)
1A-2	Fern Cliff Drive/ Canterbury Hills Community at Station 129	Residential area west of proposed Route 199, from Route 5 to Station 131.	250 ft.
1A-3	Midland Townhouses at Station 138	Residential area east of proposed Route 199, from Station 130 to Station 145.	150 ft.
2A-1	Indigo Terrace area at Station 150	Residential area east of proposed Route 199, from Station 145 to Route 615.	250 ft.
2A-2	Mount Pleasant Church and Cemetery at Station 163	Church, cemetery and residential area south of Route 615, west of proposed Route 199.	550 ft.
2A-3	Brookhaven Community at Station 163	Residential area south of Route 615, east of proposed Route 199.	250 ft.
2A-4	West of proposed Route 199 at Station 160	Residential area south of Route 615, west of proposed Route 199.	1500 ft.
2A-5	West of proposed Route 199 at Station 170	Residential area north of Route 615, east of Route 613, west of proposed Route 199.	2200 ft.
3A-2	Farm Homes at Station 263	Residential area south of Route 612, east of proposed Route 199.	700 ft.
4A-2	Apartment area under construction at Station 287	Residential area south of Route 658, west of proposed Route 199.	1050 ft.

Table 4-9
(Continued)

Site No.	Location	Areas Represented	Distance from centerline of proposed Route 199 (Estimated)
5A-1	East of Route 199 at Station 318	Residential area north of Route 658, east of proposed Route 199.	350 ft.
7A-1	West of proposed Route 199 at Station 423	Residential area north of Route 603, west of proposed Route 199.	140 ft.
7A-2	West of proposed Route 199 at Station 412	Zion Baptist Church and cemetery south of Route 614 and Highway 60, west of proposed Route 199.	950 ft.
7A-3	East of proposed Route 199 at Station 415	Residential area east of proposed Route 199, south of Route 603, north of U.S. 60.	200 ft.
8A-1	North of proposed Route 199 at Station 491	Residential area north of proposed Route 199, west of Route 168.	850 ft.
8A-2	North of proposed Route 199 at Station 481	Residential area north of proposed Route 199, along the north side of Route 646.	200 ft.
8A-3	South of proposed Route 199 at Station 464	Residential area south of proposed Route 199, along the south side of Route 646.	400 ft.

Table 4-10
Site and Study Area Locations
Alignment A-1

No site area receptors were identified with this alignment alternative, as the proposed route is entirely in undeveloped use.

Alignment A-2

Site No.	Location	Areas Represented	Distance from centerline of proposed Route 199 (Estimated)
A2-1	North of proposed Route 199 at Station 487	Residential area southwest of U.S. 168, north of proposed Route 199.	920 ft.
A2-2	North of proposed Route 199 at Station 482	Residential area north of proposed Route 199.	250 ft.
A2-3	North of proposed Route 199 at Station 473	Residential area north of proposed Route 199.	200 ft.
A2-4	South of proposed Route 199 at Station 455	Residential area south of proposed Route 199.	450 ft.
A2-5	South of proposed Route 199 at Station 474	Residential area south of proposed Route 199.	700 ft.

FIGURE 4-8

ALIGNMENTS A, A1 AND REVISED LINE A: RECEIVER LOCATIONS

ROUTE 199 CORRIDOR

JAMES CITY AND YORK COUNTIES
VIRGINIA

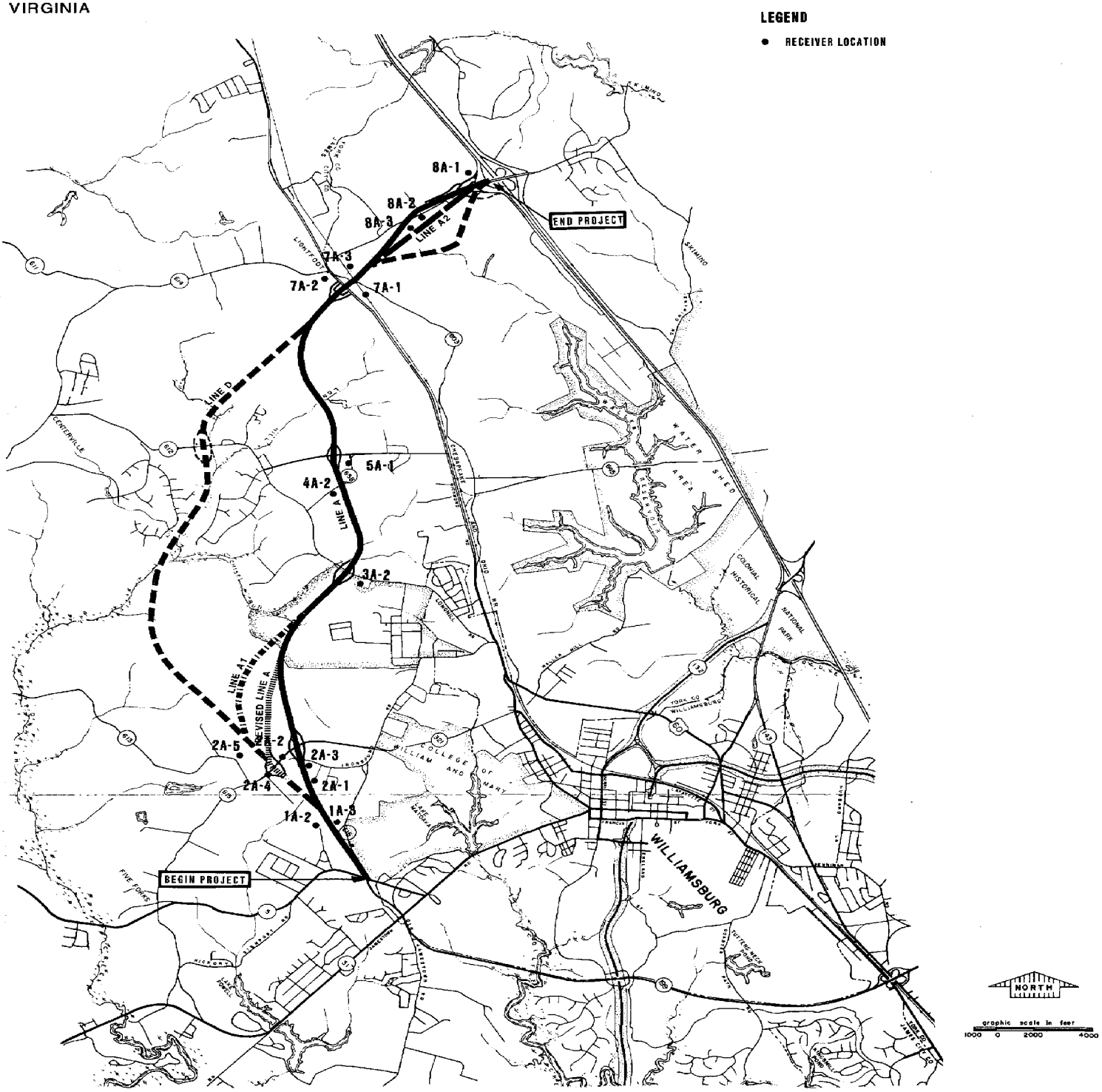


FIGURE 4-9

ALIGNMENT A-2: RECEIVER LOCATIONS

ROUTE 199 CORRIDOR

JAMES CITY AND YORK COUNTIES
VIRGINIA

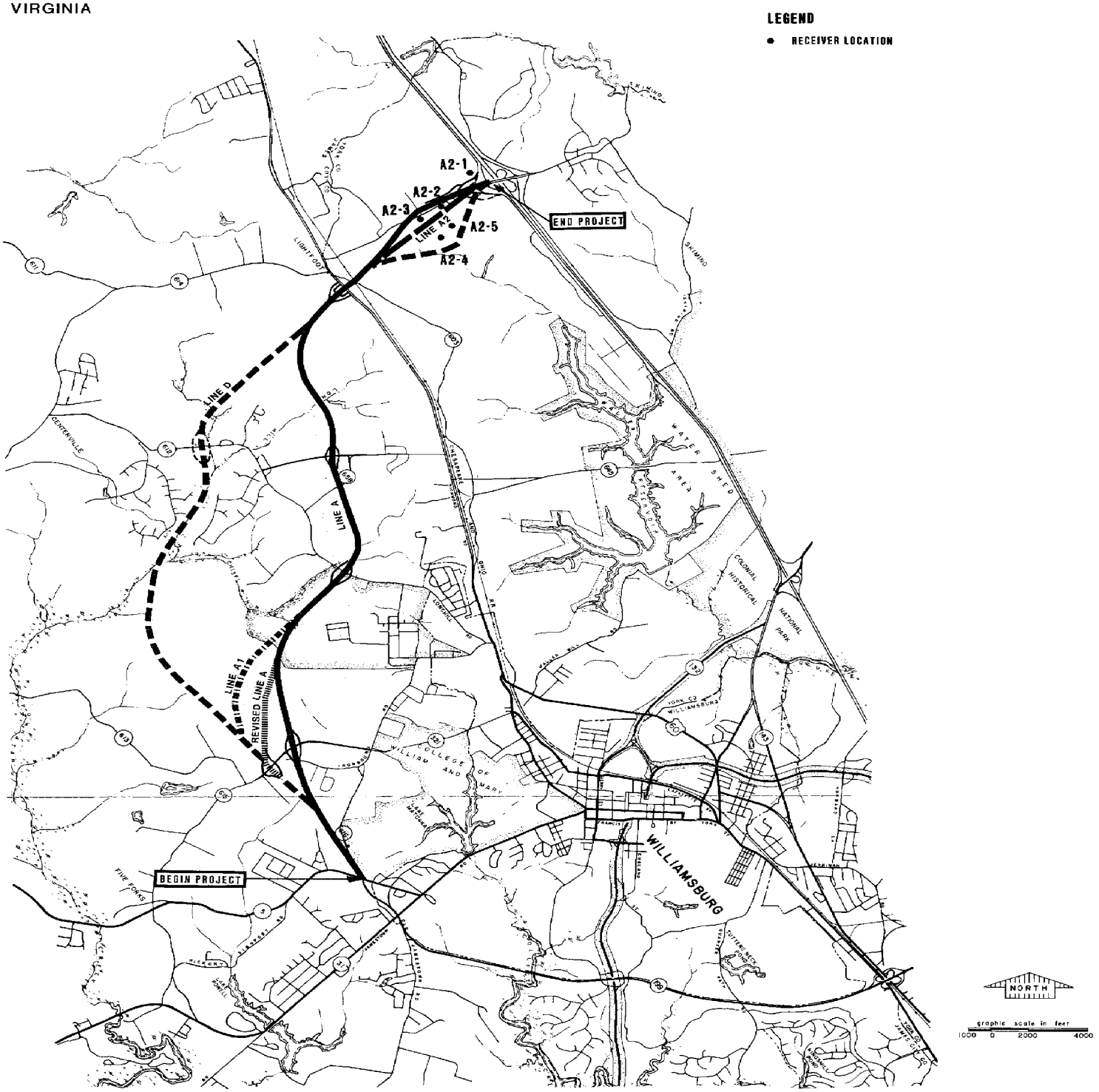


FIGURE 4-10

ALIGNMENT D: RECEIVER LOCATIONS

ROUTE 199 CORRIDOR

JAMES CITY AND YORK COUNTIES
VIRGINIA

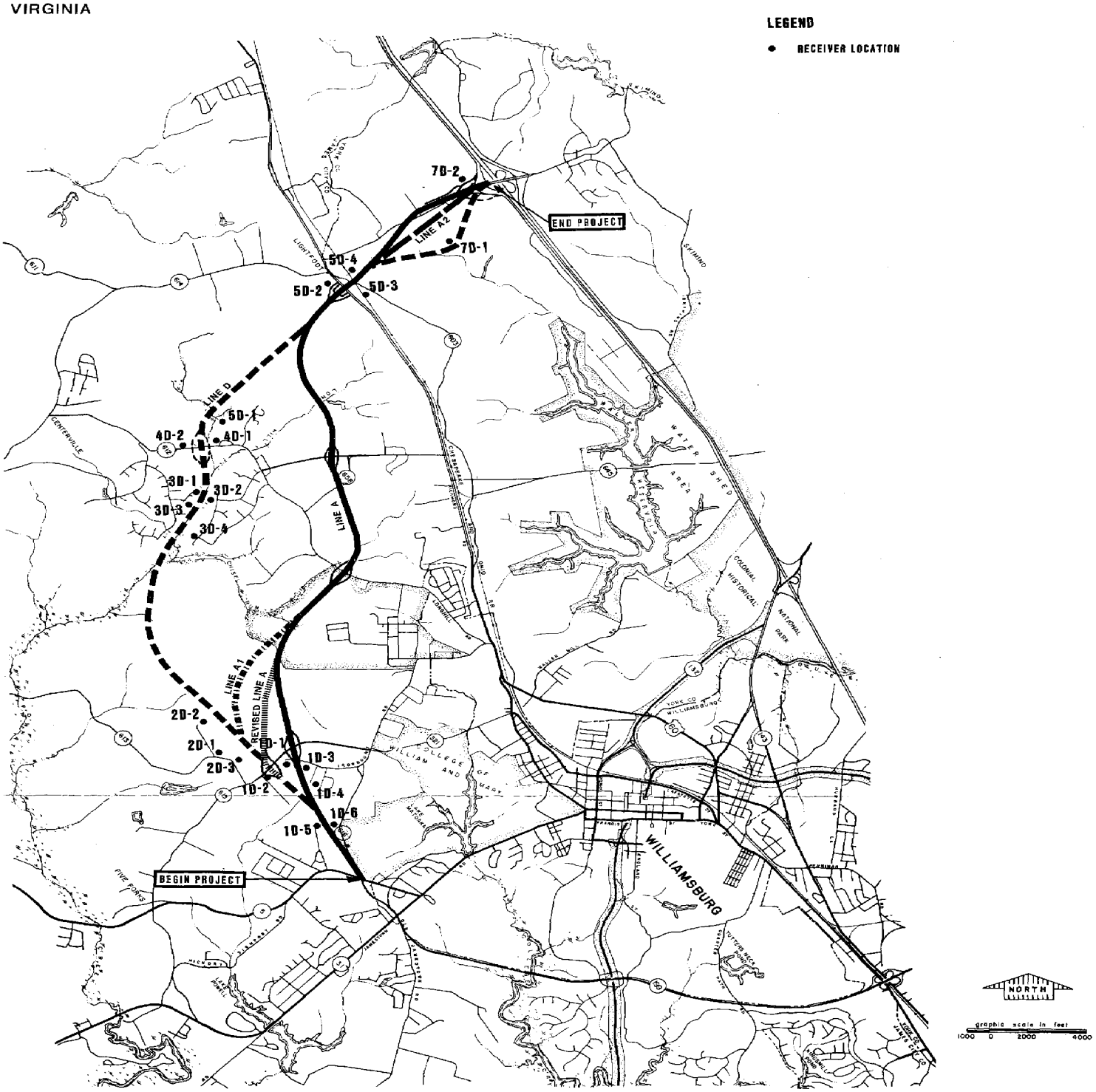


Table 4-11
Site and Study Area Locations
Revised Line A

Site No.	Location	Areas Represented	Distance from centerline of proposed Route 199 (Estimated)
1A-3	Midland Townhouses at Station 138	Residential area east of proposed Route 199, from Station 130 to Station 145.	200 ft.
2A-1	Indigo Terrace area at Station 150	Residential area east of proposed Route 199, from Station 145 to Route 615.	500 ft.
2A-2	Mount Pleasant Church and Cemetery at Station 163	Church, cemetery and residential area south of Route 615, west of proposed Route 199.	300 ft.
2A-3	Brookhaven Community at Station 163	Residential area south of Route 615, east of proposed Route 199.	1050 ft.
2A-4	West of proposed Route 199 at Station 160	Residential area south of Route 615, west of proposed Route 199.	550 ft.
2A-5	West of proposed Route 199 at Station 170	Residential area north of Route 615, east of Route 613, west of proposed Route 199.	1300 ft.

Table 4-12
Site and Study Area Locations
Alignment D

Site No.	Location	Areas Represented	Distance from centerline of proposed Route 199 (Estimated)
1D-1	East of proposed Route 199 at Station 164	Mount Pleasant Church, cemetery, and residential area south of Route 615, east of proposed Route 199.	400 ft.
1D-2	West of proposed Route 199 at Station 165	Residential area south of Route 615, west of proposed Route 199.	450 ft.
1D-3	Brookhaven Community at Station 163	Residential area south of Route 615, east of proposed Route 199.	1050 ft.
1D-4	Indigo Terrace area at Station 150	Residential area east of proposed Route 199.	500 ft.
1D-5	Fern Cliff Drive/ Canterbury Hills Community at Station 129	Residential area west of proposed Route 199, from Route 5 to Station 131.	250 ft.
1D-6	Midland Townhouses at Station 138	Residential area east of proposed Route 199, from Station 130 to Station 145.	200 ft.
2D-1	West of proposed Route 199 at Station 191	Residential area northeast of Route 613, west of proposed Route 199.	1150 ft.
2D-2	West of proposed Route 199 at Station 203	Residential area northeast of Route 613, west of proposed Route 199.	920 ft.
2D-3	West of proposed Route 199 at Station 178	Residential area north of Route 613, west of proposed Route 199.	600 ft.

Table 4-12
(Continued)

Site No.	Location	Areas Represented	Distance from centerline of proposed Route 199 (Estimated)
3D-1	West of proposed Route 199 at Station 323	Residential area west of proposed Route 199, at the northern end of Stocker Drive, in the middle of the Plantation/ Fords Estates area.	280 ft.
3D-2	East of proposed Route 199 at Station 327	Residential area east of proposed Route 199, at the northern end of Hempstead Road, in the Windsor Forest Community.	380 ft.
3D-3	West of proposed Route 199 at Station 320	Residential area west of proposed Route 199, at Bonyman Court, in the middle of Plantation/Fords Estates area.	440 ft.
3D-4	East of proposed Route 199 at Station 302	Residential area east of proposed Route 199, at the southern end of Hempstead Road, in the Windsor Forest Community.	350 ft.
4D-1	East of proposed Route 199 at Station 351	Lafayette High School, and residential area north of Route 612, east of proposed Route 199.	1000 ft.
4D-2	West of proposed Route 199 at Station 347	Residential area north of Route 612, east of proposed Route 199.	600 ft.
5D-1	East of proposed Route 199 at Station 365	Lafayette High School, northern portion, west of track.	800 ft.
5D-2	West of proposed Route 199 at Station 470	Zion Baptist Church and cemetery south of Route 614 and Highway 60, west of proposed Route 199.	950 ft.
5D-3	East of proposed Route 199 at Station 471	Residential area south of Route 603, east of proposed Route 199, north of U.S. 60.	140 ft.
5D-4	West of proposed Route 199 at Station 477	Residential area north of Route 603, west of proposed Route 199.	200 ft.

Table 4-12
(Continued)

Site No.	Location	Areas Represented	Distance from centerline of proposed Route 199 (Estimated)
7D-1	West of proposed Route 199 at Station 466	Residential area, horse farm, west of proposed Route 199.	400 ft.
7D-2	North of proposed Route 199 at Station 491	Residential area northwest of Route 646, and southwest of U.S. 64/Route 168.	920 ft.

GENRAD Meter was used to establish ambient noise levels. A thirty-minute field study period was used.

In areas where the dominant noise source was traffic, the ambient noise levels were determined by using the Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model, STAMINA 2.0. Basically, the STAMINA 2.0 program estimates the acoustic intensity at a receiver location resulting from a series of roadway segments; e.g., the source. Sound characteristics are defined by such variables as vehicle speed, and distribution of vehicle types (i.e., medium truck, heavy truck, auto). The characteristics of the source-to-receiver path include the effects of intervening barriers, topography, trees and atmospheric absorption.

Sample estimates made by the STAMINA program were compared and verified by field noise equipment measurements. The existing noise levels at all the 48 sites as obtained from field monitoring and model studies are presented in Section 5.9. The existing noise levels in the project area range between 37 and 62 dB. Lowest value (about 40 dB) has been measured in the rural area with no nearby roadway. This represents a typical location not influenced by nearby traffic and the noise level at this location can be taken as the representative background noise level in the project area. Maximum noise level of about 62 dB has been measured close to Route 60. At this location, motor vehicles on Route 60 are major intrusive sources of noise. These studies suggest that existing daytime L_{eq} values in the project area are between 40 and 60 dB. Nighttime L_{eq} values are expected to be between 30 and 50 dB. Furthermore, the existing noise levels are below the required noise abatement criteria of 67 dB(A).

4.8.5 Predicted Noise Levels

Noise levels were predicted for all 48 receptors, utilizing STAMINA 2.0. Because traffic is anticipated to be the primary source of noise at all sites if the proposed project is constructed, all design year build

levels were calculated by incorporating forecasted traffic volumes into the model.

Assessment of noise impacts requires four comparisons of noise levels:

1. Existing to Design Year - illustrates the change which would occur between the present time and the year 2010, assuming the proposed project is constructed;

2. No Build and Build Alternatives A, A-1, A-2, Revised Line A and D - demonstrates the portion of change that can actually be attributed to the proposed project; and

3. Build to Noise Abatement Criteria (NAC) - Determines whether the predicted noise levels will be compatible with present land use if the proposed project is constructed.

4. Build to Substantial Increases in dBA - For the purposes of this study, 10 dBA or more would represent a substantial increase in dBA. 10 dBA is equal to a doubling of sound to the receptor, and is useful to compare relative impacts to receptors when sound levels are low.

Results obtained from these comparisons are summarized in Section 5.9.

4.9 WATER QUALITY AND AQUATIC ECOLOGY

4.9.1 Hydrology

Both lentic and lotic systems occur in the study area. The predominant lentic bodies are Waller Mill Reservoir and Scott's Pond. Waller Mill Reservoir is important hydrologically as a water supply source and as an aid in runoff control.

Stream water resources in the project area include Mill Creek, Queen Creek, and tributaries of Powhatan Creek. The primary tributaries of Powhatan Creek are Long Hill Swamp and Chisel Run. Powhatan Creek flows generally south approximately 21 miles to its confluence with the James River. The upper perimeter of the watershed follows approximately along the 100-foot mean sea level contour. These streams are not used as a drinking water supply source and there are no public water supply reservoirs or watersheds for public water supplies in the study area (Virginia Department of Health, 1985).

4.9.2 Groundwater and Mineral Resources

The Commonwealth of Virginia adopted both standards and criteria for groundwater in 1977 with the intent of protecting and preserving the quality of its groundwater resources. One of every four Virginians depends on groundwater as a potable water source. In addition, many streams are recharged by groundwater, particularly during periods of low flow or dry weather conditions. Standards and criteria applying to groundwater have been adopted both for the State and for the individual physiographic provinces in the case of certain parameters.

Four aquifers form a complex aquifer system in the study area. These aquifers are known as the 1) Quaternary, 2) Yorktown, 3) Eocene-Paleocene, and 4) Cretaceous. All four aquifer contain water that generally meets the state standards for drinking water.

The Quaternary aquifer lies at the surface and is approximately 40 to 60 feet thick in the study area. The sand zones of the aquifer are tapped for small water supplies for miscellaneous domestic uses. Individual wells typically yield a few gallons per minute. Although total usage of this aquifer is unknown, it's yield for the entire area of James City County and is approximately several thousand gallons a day. This aquifer is recharged soley by precipitation.

The Yorktown aquifer consists of beds of fine to coarse sand with some gravel and shells. It contains water under artesian conditions as it is separated from the overlying Quaternary aquifer by sandy clay and clay. The Yorktown aquifer is approximately 150 to 200 feet thick in the study area. It is capable of producing up to 100 gallons of water per minute from an individual well, but has not been used as a primary source of water because greater yield is available from the underlying aquifer. Water recharges the Yorktown aquifer by downward vertical leakage from the Quaternary aquifer and by groundwater flow from the west which enters the aquifer along the Fall Line.

The Eocene-Paleocene is an artesian aquifer consisting of beds and lenses of fine to coarse sands with thin beds of shell material and limestone. The Eocene-Paleocene aquifer is approximately 100 to 150 feet thick in the study area and produces from 5 to 25 gallons per minute per foot of drawdown from a typical well. It is confined and separated from the overlying Yorktown aquifer by clays and marl. In some areas this aquifer is in hydraulic continuity with the underlying aquifer. The Eocene-Paleocene aquifer supplies water to domestic wells and residential subdivision. In James City County, total pumpage from this aquifer is estimated at less than 1 million gallons per day. Groundwater flow in the aquifer is toward pumping centers which are generally located to the west of Williamsburg. The Eocene-Paleocene aquifer is primarily recharged from the slow vertical leakage of overlying aquifers and from a westerly lateral flow.

The Cretaceous aquifer is the most productive and extensively used source of groundwater in James City County. It consists of a series of interbedded sand, silt and clay layers. The estimated depth of the aquifer is 1100 to 1300 feet in the study area. The cretaceous aquifer is seperated from the overlying. Ecocene-Paleacene by clays, silts and fine grained clastics. Most wells are placed in the upper 200 foot of the aquifer with some sand units being as thick as 75 feet. The specific capacities of wells in the aquifer range from 5 to 30 gallons

per minute per foot of drawdown. Well yields range from 100 to 1,000 gallons per minute. Movement of groundwater in the Cretaceous aquifer is generally toward pumping centers. Total pumpage in James City County is estimated at 7 to 8 million gallons a day. The major pumping center in the study area is in Colonial Williamsburg. Another major pumping center occurs at the Don Badische Company, southeast of the study area. The Cretaceous aquifer contains both fresh and saline waters. Pumpage in the study area favors the movement of saline water from the east toward the cone of depressions caused by pumping centers. However, data shows that the position of saline water defined by the 250 milligrams per liter contour line has been relatively stable since 1913. The cretaceous aquifer is recharged by leakage of freshwater from overlying aquifers and through lateral movement of groundwater from the west, where Cretaceous sediments are at the surface along the Fall Line.

Mineral resources in the study area consist of various sediments deposited over igneous metamorphic and sedimentary rocks. Depth of sediments vary between 1000 and 1500 feet and consist of such materials as sand, clay, peat, shell, quartz, marl, limestone and gravel. Resources of quartz, marl and limestone range between 300 and 400 ft in thickness and are resources typically found above the igneous and metamorphic formations, which generally lie at a 300-400 foot depth. Sandstone and shall are of unknown thickness.

4.9.3 Surface Water

Four streams were selected for sampling in the study area (see Figure 1-3): Queen Creek, Mill Creek, Chisel Run, and Long Hill Swamp. Each of the latter three were flowing systems that had relatively unconsolidated bottoms of fine sand, silt, and detritus. Obstructions

such as fallen trees are common features that provide good habitat heterogeneity. Queen Creek was anticipated as being crossed by Alignment D, but it was merely a shallow ravine without flowing water at the time of inspection.

Mill Creek is a first and second order stream that is intermittent in most years. It varies from one to three feet wide and from one to five inches deep. Its banks vary from one to three feet high and as such has the most steeply cut banks of any stream in the study area.

Chisel Run is a second order stream considerably larger than Mill Creek. Average width is six feet and average depth is five inches. Scour holes are relatively common and provide good habitat heterogeneity. Shallow banks are generally one foot high which facilitates floodplain dispersal of water during storm events.

Long Hill Swamp is a third order stream that flows south to form the Powhatan Creek at the confluence with Chisel Run. It is the largest stream potentially impacted by the project. It varies from 8 to 12 feet wide and from 4 to 24 inches deep. As with Chisel Run, its shallow banks facilitate stormwater dispersal across a relatively wide floodplain.

Water quality data were collected at each selected sampling location in May and August, 1985, except Location 12 (Queen Creek), which was dry at the alignment crossing during both sampling periods. The collected water quality data indicates no unusual findings with all parameters within acceptable standards.

4.9.4 Aquatic Ecology

Fish and benthic macroinvertebrates were sampled in May and August 1985 in order to describe the baseline biotic communities present within the study area. Fish sampling was accomplished using a 4-foot x 12-foot, 0.25-inch mesh seine. Benthic macroinvertebrates were

sampled quantitatively using an Ekman dredge and qualitatively using D-frame dipnets.

A total of 19 fish species were collected in the study area. The fauna was dominated by mosquito fish (Gambusia affinis), eastern mud-minnow (Umbra pygmaea), Johnny darter (Etheostoma nigrum) and pirate perch (Aphredoderus sayanus). Sport fish such as bluegill (Lepomis macrochirus), flier (Centrarchus macropterus), chain pickerel (Esox niger) and grass pickerel (Esox americanus vermiculatus) were limited in distribution, usually confined to scour holes. Chisel Run offered the greatest habitat heterogeneity as is reflected by the diversity of fish species collected, including the bluespotted and redear sunfish (Enneacanthus gloriosus and Lepomis microlophus).

Mill Creek, the smallest creek in the area, supported a low number of species and few individuals, whereas Long Hill Creek supported a diversity somewhat similar to that of Chisel Run. The lower portions (those associated with Alignment D) of Long Hill Creek supported a larger density and diversity of fish than the upper portion due to increased stream size and habitat diversity.

In addition to providing habitat for those fish collected, creeks of the study area may be used during favorable years by spawning alosids. Anadromous species having the greatest potential for utilizing these creeks are the alewife (Alosa pseudoharengus) and blueback herring (Alosa aestivalis). Lower Powhatan Creek has been confirmed as an alosid spawning site (Davis et al. 1970), and spawning is known to occur at least as far upstream as mile 8.7 (Mudre etal. 1985). However, all creeks crossed in the Chisel Run drainage area are upstream of an impassable dam. This limits the potential habitat of these species to the Mill Creek and Long Hill Swamp crossings. Mitigation measures are explained in more detail in Section 5.10.4 and in the Water Resources and Ecology Technical Report.

A diverse macroinvertebrate fauna was present in the study area. Common organisms include amphipods, isopods, odonates and chironomids. Differences in species composition and density among and within sampling locations appeared to be related to habitat. Throughout the streams sampled, the bottom substrate consisted of soft silts and sands. In many areas, leaf litter was abundant. Where leaf litter was abundant, numerous detritivors and scavenging epibenthic organisms were common (Asellus spp. and Gammarus spp.) as well as predatory forms such as many odonates. Conversely, where leaf litter was absent burrowing epibenthic forms (various midges and worms) were most common. Freshwater mussels were found sporadically throughout the creeks of the study area. The predominant species was Elliptio complanata, a common species in streams of the eastern seaboard. A particularly dense population was found in the east branch of Long Hill Swamp at Stations 9 and 10.

4.9.5 Wetlands

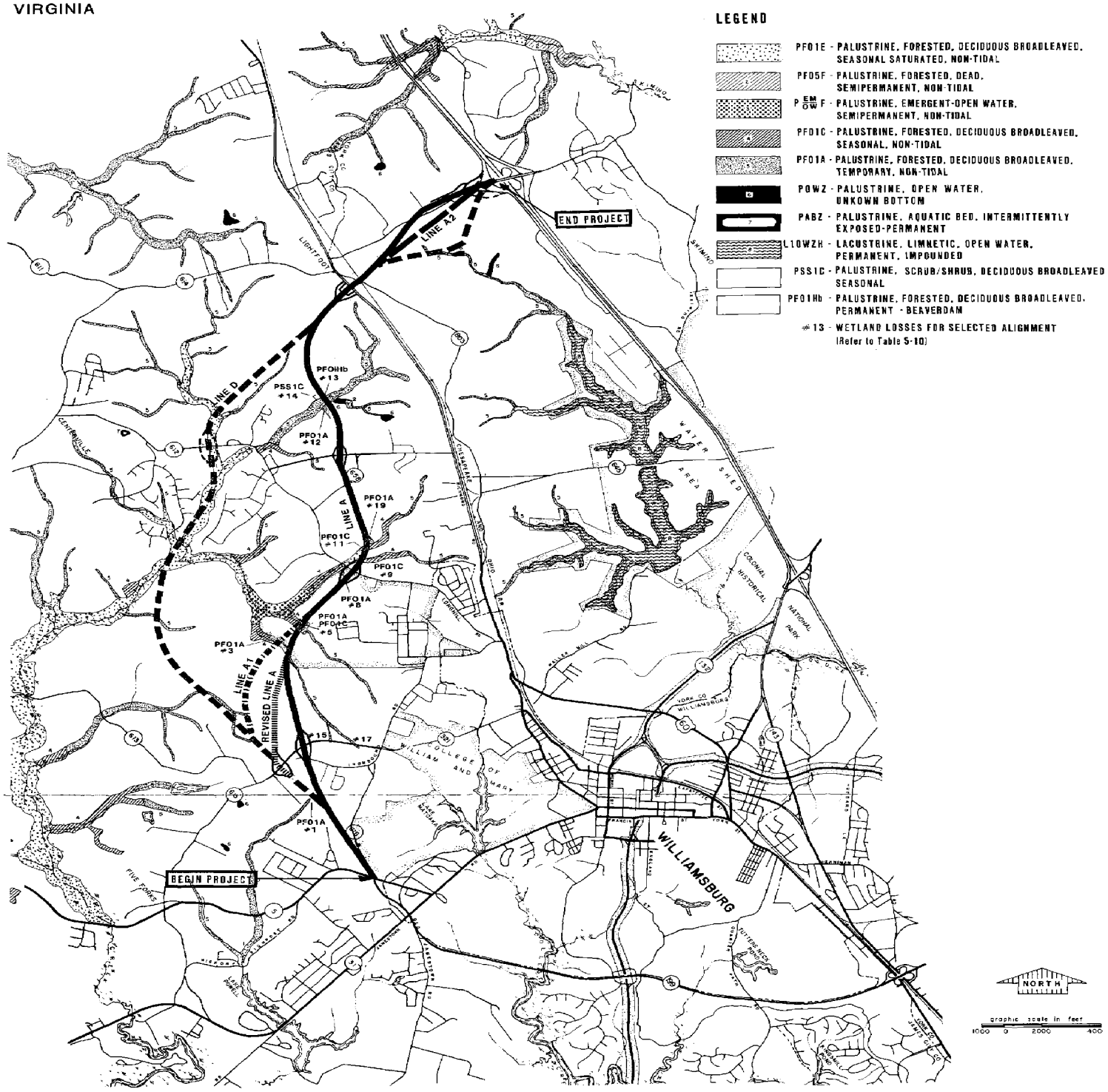
Ten wetland types in three watersheds were identified on the proposed ROW of the selected alignment (Figure 4-11). A total of 12.17 acres will be directly affected. Nine of the wetlands, accounting for 11.86 acres, are classified as palustrine, forested, broad-leaved deciduous wetlands with hydrologic regimes ranging from temporarily flooded to seasonally flooded to permanently flooded (beaver impounded). The remaining wetland (#14, 0.31 acres) is a seasonally flooded, palustrine, shrub-scrub, broad-leaved deciduous wetland. All but one of the wetlands are located on alluvial sediments in the flood zones of small streams. Wetland #19 is a seepage slope perched on clayey soil above the flood zone of Chisel Run. Due to the location of the wetlands along streams, they have relatively high values for surface hydrologic functions (flood storage, shoreline anchoring, and sediment trapping) and low values for groundwater hydrologic functions (recharge and discharge). Wetland functional values are summarized in Table 5-11.

FIGURE 4-11

WETLANDS

ROUTE 199 CORRIDOR

JAMES CITY AND YORK COUNTIES
VIRGINIA



5.0 ENVIRONMENTAL CONSEQUENCES

5.1 TRAFFIC AND TRANSPORTATION

The environmental consequences of the traffic due to the alternatives are the additional roadway improvements needed to provide acceptable levels of service in the area. The following discusses the impacts of each alternative.

No Build Alternative--The major improvements required on the alternative include: (1) the widening of Route 60 to 8 lanes from Route 60 Bypass to Ironbound Road, (2) widening of Route 60 to 6 lanes from Ironbound Road to Route 645, and (3) the widening of approximately 22 miles of two lane roadways. In addition, improvements need to be made to 13 intersections. All of the improvements can be made without significant impacts on surrounding areas except the widening of Route 60 to 8 lanes. The widening in the area between Route 60 Bypass and Ironbound Road cannot be accommodated without a significant amount of relocations of existing commercial development.

Alignments A, A-1, A-2 and Revised Line A--To provide an acceptable level of operation on the system, the following improvements need to be implemented: (1) widen Route 60 to 6 lanes from Lafayette Road to Route 645, (2) widen approximately 14.25 miles of two-lane roadways to 4 lanes, and make intersection improvements at 10 locations. These improvements can all be completed with a minimum impact on adjacent areas. The improvements to the rural roadways required by Alignment A represent a 35 percent reduction over the improvements needed for the No Build Alternative.

Alignment D--This alignment requires the following improvements: (1) widening Route 60 to 6 lanes from Lafayette Road to Route 645, (2) widening approximately 13.5 miles of two-lane roadways to four lanes, and (3) improvements at 9 intersections. As with Alignment A, these improvements can be implemented without a significant impact on the surrounding area. It should be noted that the improvements required on two-lane roadways are reduced 38 percent from the No Build Alternative.

Overall, the build alternatives will provide a better level of service, with less additional improvements required, than the No Build Alternative. In addition, Alignment D will provide slightly better traffic service than Alignment A. This is due to a spreading of the traffic on Alignment D and the relief provided to Route 60.

5.1.1 Trucks

At present, heavy trucks are moving along Route 5, in and out of the west side of Williamsburg, and then along Route 199 to I-64. Additionally, movement is occurring in the Williamsburg area along the Route 5/31 corridor, and then back to the north, along Route 60. The completion of Route 199 around the west and north sides of Williamsburg will provide a route for these trucks to the north, without entering the inner-core area of Williamsburg. This will result in more efficient travel for the trucks and increase the aesthetics of Williamsburg, especially in the Historic District where heavy truck traffic is thought to be incompatible by many. The quantity of truck traffic actually rerouted was not quantified. The travel demand model approved by the Virginia Department of Transportation for the traffic projections combined truck traffic and non-homebase trips. The model allowed only five trip types and the Department did not select truck traffic as a specific trip type, but used the truck traffic and non-homebase trip combination. It is likely that up to 50% of truck traffic destined to downtown Williamsburg will be rerouted.

5.2 LAND USE

5.2.1 Alignments A, A-1, A-2 and Revised Line A

Alignment A has appeared on James City County's Land Development Concept Map since 1975. Consequently, intensive residential, commercial, and industrial uses, as well as community facilities, have been sited adjacent to this alignment. Low density residential use is planned for the short segment of Alignment A-1 and Revised Line A that is different from Alignment A.

York County, on the other hand, sees the portion of Route 199 between Route 603 and I-64 as a major impetus for upper portion of the county to attract economic development. In 1984, this area was changed from low-density residential to tourist commercial at the instigation of the Williamsburg Pottery Factory and many of the property owners who reside in the corridor.

Construction of the road is a priority listed in York County's Transportation Element of the Comprehensive Plan. The Board of Supervisors has not officially stated a preference of one alignment over the other. The Board has stated, however, its desire not to upgrade Route 646 while at the same time building Route 199. The Williamsburg Pottery Factory, the major land owner in the York County portion of the corridor, opposes Alignment A, stating that this alternative would take the most buildable portion of a site on which it plans to expand.

5.2.2 Alignment D

James City County planners have expressed opposition to this alignment because their plans and public facility locations support Alignment A, which has been a component of the County Plan for a decade. The current plan (described previously) attempts to concentrate growth in a crescent-shaped corridor around the City of Williamsburg, ostensibly to control the amount and cost of public services associated with development. It would, therefore, be anticipated that to modify the alignment in James City County would antagonize some private development groups, as well as County planners, many of whom view Alignment A as integral to future land use plans.

5.2.3 No Build Alternative

A substantially large transportation demand along the existing section of Route 199, on Route 60, and in the area in general, can currently be observed and is projected to significantly increase over the next several years. If the proposed circumferential facility is not

implemented, this traffic demand would have to be served by alternative facilities, especially Route 60. Traffic analysis indicates that this would cause the level of service on the existing streets in the project corridor to increase until a forced flow condition is reached. Congestion will increase travel times for motorists and result in increased fuel consumption, higher levels of air pollutants, greater delays for emergency vehicles and an aesthetically unpleasant and incompatible atmosphere in the Williamsburg Historic District. The existing transportation network within James City County, York County, and the City of Williamsburg is inadequate for future growth and will deter industrial/commercial growth in the region.

Conversely, if the project is not constructed, there will be no displacement of families or businesses; no adverse wetland, construction or visual impacts will result; right-of-way would not have to be acquired, and funds will not have to be expended.

5.3 SOCIOECONOMICS

5.3.1 Relocation

Alignment A--Construction of Alignment A would displace an estimated eleven families, two of which reside in mobile homes. All families which would be displaced occupy homes located between Route 60 and Interstate 64.

Of the estimated eleven displaced families, four are low- to moderate-income minorities. Three of these families reside in single-family dwelling units and own their properties, which are all in sound condition. A more detailed discussion of properties and property values is included in the SocioEconomic Technical Report. One of these homes is occupied by elderly persons, however, all four are estimated to live on fixed incomes.

Many homeowners on Route 60 have indicated their desire to County officials to have their property rezoned from low-density residential to nonresidential use, should the Warhill Tract which is located across the street, be similarly rezoned. County officials have indicated that such a request is not unreasonable. There does not, therefore, appear to be any major opposition to residential relocation from this area.

The two mobile homes to be displaced are located along Mooretown Road, directly across from the Chesapeake and Ohio Railroad tracks. The larger of the two mobile homes is relatively new and is occupied by a young, lower-income minority family. The second mobile home appears to be vacant.

The remaining six families to be displaced occupy houses adjacent to Route 646 in York County. All are occupied by white middle-income families, several with children. These homes are of modest size and appear to be owner-occupied and in fair to very good condition.

One business, the WBCJ radio station and tower, will be displaced by Alignment A. It appears that the radio station could relocate on available vacant land in western James City County; however, new facilities will most likely have to be constructed. A more detailed discussion of displacements is included in the Socio-Economic Technical Report.

Alignment D--Residential displacement would occur at three points along the Alignment D corridor: Route 615; Route 60; and Route 646 near its intersection with Interstate 64. An estimated eight families would be displaced by Alignment D. The dwelling units to be displaced are two mobile homes (one of which apparently is vacant) and seven single-family detached homes. The same four minority relocations described for Alignment A must also be relocated for Alignment D. At least one of these four families is elderly.

Alignment A-1--An estimated 13 families would be displaced by this alignment; 11 are the same as Alignment A and an additional three

occur where A-1 diverges. Family characteristics for these three families are similar to the 11 previously discussed for Alignment A.

Revised Line A--An estimated 13 families would be displaced by this alignment based on a November 1986 estimate by VDOT. Three of the 13 residential displacements are located at or near Williamsburg Pottery interchange.

Alignment A-2--Six families would be displaced by Alignment A-2, which covers the area south of Route 646 between the Chesapeake and Ohio Railroad tracks and I-64. One is a young, moderate-income black family, while the remaining five families impacted are believed to be middle-income white households.

No Build Alternative--No displacement of families will occur if Route 199 is not constructed.

5.3.2 Special Relocation Problems

Alignment A, A-1, A-2, Revised Line A and D--It may be difficult to relocate the mobile homes on Alignment A and D. Although the County has the highest number of mobile home park sites in the Peninsula region, it is estimated that the current vacancy rate is less than three percent. Mobile homes are permitted, with a special use permit, on individual lots in the General Agricultural zone. Recent revisions of the County Zoning Ordinance prohibit relocation within the County of any mobile home which does not meet U.S. Department of Housing and Urban Development standards (mobile homes built after 1976). It is anticipated that one, and perhaps both, of the mobile homes displaced by Alignments A, D and A-2 will not meet HUD standards and, therefore, could not be relocated within James City County. In addition mobile home placement requires a special use permit and can only be placed on specially zoned sites. This reduces the number of replacement possibilities for mobile homes significantly.

Acquiring replacement single-family detached housing for the low- to moderate-income families displaced by Alignment A will also be difficult. According to the Williamsburg Board of Realtors, the 1985 average selling price of a detached residential unit is $99,834 and $86,622 for an attached townhouse or condominium in Williamsburg, James City County, Upper York County and the portions of New Kent and Charles City Counties. These numbers reflect only those transactions which occurred through a real estate broker and include both new and re-sale homes. These prices make it particularly difficult for low- to moderate-income families to find affordable housing, especially in James City County which, in recent years, has recorded the highest average selling price for single-family detached housing in the Williamsburg area. Lower- and moderately-priced homes exist primarily in the northwestern portions of both James City and York Counties. Several newer Upper James City County subdivisions, for example "Racefield and Wedgewood," have been developed recently where housing prices average between $50,000 and $60,000.

Comparable replacement housing in both James City and Upper York Counties range in age from one to over fifty years old and conditions range from excellent to fair. Most comparables are one-story frame or brick dwellings containing six to seven rooms with one or one-and-a-half baths.

Each displacee will be given sufficient time to negotiate for and obtain possession of decent, safe and sanitary housing. All housing offered will be fair and available to all persons regardless of race, religion, sex or national origin.

The requirements of the Uniform Relocation Act will be followed. The objective is to afford each displacee the opportunity to relocate to an equal or better facility than one presently occupied. There is also a commitment to last resort housing.

5.3.3 Community Cohesion

The communities which exist presently in the Route 199 corridors range from smaller, established low- to moderate-income communities to new, large-scale planned communities oriented toward the upper-middle income homeowner. The rapid amount of residential growth which has occurred during the past decade, particularly in James City County, has resulted in a continually changing community pattern.

All build alignments follow logical community boundaries except for the few instances described below.

Alignments A, A-1, A-2 and Revised Line A--Further northward, at its intersection with Route 615, Alignment A transverses the western edge of the Strawberry Plains Road area. Alignment A separates the Indigo Terrace/Brookhaven Drive on the east from Indigo Dam Road on the west. Indigo Terrace/Brookhaven Drive is a middle-income area, with a high percentage of mobile homes. Situated between these two areas is the Mount Pleasant Baptist Church which serves as a focal point of the Indigo Terrace/Brookhaven community.

Alignment A would create a physical barrier between the church and the community it serves. This negative impact will be balanced, however, by the positive influence of reduced traffic congestion along Ironbound Road which is one of the most severe problems facing this community, according to James City County's Community Development Plan.

The new single-family and multifamily communities in the Longhill Road vicinity would benefit from Alignment A over the long term, in terms of improved access and reduced traffic congestion along Longhill Road. Each development tends to be a community unto itself and, therefore, the addition of Route 199 would not necessarily detract from any sense of community cohesion.

Alignment D--At Ironbound Road, Alignment D crosses between Mount Pleasant Baptist Church and Indigo Dam Road, retaining the church on the same side of the roadway to the Indigo Terrace, having a less divisive impact upon this community than Alignment A.

No Build Alternative--If Route 199 is not built, traffic congestion may continue to be a problem along Ironbound Road. In the long term, the new single-family and multifamily communities in the Longhill Road vicinity would benefit from improved access and reduced traffic congestion from Alignment A construction. However, the disruptions to community cohesion described for Alignment A also would not be realized.

5.3.4 Housing

Alignments A, A-1 and Revised Line A--The residential development patterns in this corridor have been established to a large extent during the past decade and would not be altered significantly as a result of the roadway. The proximity of the corridor to the rapidly-developing greater Williamsburg area ensures continued residential development whether or not Alignment A is built. It is the magnitude of new development which will be impacted. The James City County Board of Supervisors has made it clear that transportation access is a crucial consideration in approving rezonings to more intensive uses in this area. Two large undeveloped tracts of land exist in James City County between Alignments A and D: the Warhill Tract and vacant Eastern State Hospital property. The state intends to sell the hospital property deemed surplus at public auction by 1988. Construction of Alignment A would facilitate access and, thus, the attractiveness to residential developers and homebuyers in the area.

Alignment D--The location of Alignment D in the western, less developed portion of James City County, on the edge of the "Primary Service Area," is likely to impact the local housing market to a greater extent than Alignment A. More vacant land exists at a

relatively lower cost and, given the bright outlook for housing development in James City County, construction of homes would be expected to immediately follow construction of Route 199. Alignment D would push new residential sprawl further westward. Perhaps the greatest impact on residential development will be felt in the section of the corridor between Ford's Colony and Route 615, where water and sewer lines are proposed by the year 2000 in the County's current Land Use Plan. Lower-density, single-family detached housing would be the type of housing anticipated in most of this area; however, in the Warhill Tract vicinity medium density housing, both single and multi-family, would likely be developed.

Alignment A-2--This Alignment would result in a more rapid transition of the Route 646 area between Route 60 and I-64 from residential to tourist commercial uses. No impact would result on the local housing market.

No Build Alternative--Without construction of the proposed Route 199 extension, residential construction activity in the corridors would most likely remain within the current area which has an existing road network, albeit disjointed and congested. Residential development in the southwesterly direction would continue to occur; however, there are few roads existing except for those located in planned communities on such as Ford's Colony. It appears certain that the surplus Eastern State property would still be developed residentially, although at a much lesser density without the construction of Route 199. The County Board does not appear supportive of the approval of new residential communities without roads, specifically Route 199, that will not adequately support traffic generated by the growth.

5.3.5 Income

The effect of the proposed action on personal income is directly related to business growth and development. A substantial business impact due to Route 199 is expected to occur in the areas of retail and

tourist commercial growth in the vicinity of Lightfoot, principally in the Route 646 corridor and on the Warhill Tract. As described earlier, both York County and James City County have relatively low tax bases with which to support the high cost associated with rapid residential growth. The encouragement of growth in nonresidential tax base is a high priority for these jurisdictions.

Because James City County officials view Route 199 more as a bypass for residents who live in the central corridor of the County, business growth along the County's portion of Route 199 would be limited to community retail situated at points where existing radial arterial roadways cross the roadway. However, the most recent Warhill Tract rezoning petition included proposal for development of 90,000 square feet of commercial and office space within two years and a 600,000 square foot regional shopping mall within five years. Although this petition was denied by the Board of Supervisors, it does demonstrate the increasing attractiveness of James City County for large-scale nonresidential development as the population and income reach the required market threshold amounts. The increasing size and income of the market, combined with visibility and accessibility offered by a new four-lane arterial highway, would make increased business development probable in designated "nodal" areas.

Alignments A, A-1 and Revised Line A--The most substantial impact would be felt in the segment between I-64 and Route 60 where new business development is anticipated to be extensive. This expectation is based upon the recent rezoning of the York County portion of the corridor to tourist commercial and development proposals that have occurred in that area.

In James City County the Warhill Tract would likely become the site for considerable business growth by the year 2010 in the form of major retail, office and light industrial uses developed on a relatively large scale. This area is considered by many to be the most prime undeveloped site existing within the County's "Primary Service Area."

The parcel of land fronting Route 60 between 646 and the U.S. Post Office building would appear to have business development potential. At present, sited in this area are: the S&H Home Center, a small neighborhood market frequented by nearby residents of the Mooretown Road area, a small rental apartment building and a U.S. Post Office. These uses are of low value construction and can be considered as transitional uses. The parcel is owned by one of the Pottery Factory principals and is being held for commercial development at some undetermined future date. As in the case of the Warhill Tract, it is reasonable to conclude that the construction of Route 199 would be a major determinant of how and when this site would be developed.

It is not likely that neighborhood-level retail centers will be developed on vacant parcels near the Longhill Road and Ironbound/Monticello Avenue intersections with Alignment A and the existing terminus of Route 199 at Route 5, given the residential growth and high disposal incomes characteristic of the corridor. An example of the market attractiveness to retail development is the neighborhood-level retail center under construction at the intersection of Old Towne and Longhill Roads.

The James City County Comprehensive Plan shows several areas of "major commercial" development defined in the plan as "large commercial uses or combinations of uses providing goods and services primarily to local residents and requiring a support population of 15,000 or more." In the Plan, community-level retail uses are shown adjacent to Alignment A in three locations: at Lightfoot; between Eastern State Hospital and Ironbound Road; and near the intersection of Route 199 and Route 5. According to James City County planners, retail development can be expected to be built in one of these locations. At the current time, there is a proposal to construct a 70,000 square foot center in the northwestern quadrant of the Route 5/Strawberry Plains intersection.

Alignment D--Similar to Alignment A, Alignment D would be expected to impact business growth and development in the Upper York County portion of the corridor. Most of the new business development would be motel, restaurant and outlet retail. As in the case of Alignment A, and its variations, York County officials view the roadway as the major catalyst for economic development in the Upper County. James City County officials, on the other hand, see Route 199 simply as a bypass which will segregate residential traffic generated from new residential developments located in the central County from tourist and business traffic traveling on Route 60.

Construction of Alignment D, however, would enhance greatly the accessibility and visibility assets of the Warhill Tract and, thus, will increase the probability that this large parcel will be developed. It is likely that, if the Warhill Tract is rezoned to more intensive uses, nonresidential employment growth would occur on this site.

No Build Alternative--Future business growth and impacts associated with build alternatives would not be realized should Route 199 not be constructed.

5.3.6 Employment

Alignments A and A-1--One employer/business, the WBCJ radio station, would be displaced by Alignment A. This business is owner-operated and employs an estimated ten persons. Given the time the station has existed, relocation appears likely and will not negatively impact the community it serves. No loss in employment would be expected to occur.

Alignments D and A-2--No businesses would be directly displaced on Alignment D because the radio station could remain at its present location. A section of the Cedar Valley Horse Farm's grazing area appears to be within the alignment. It is likely that construction of a 4-lane primary highway next to the farm would result in conversion to more employment intensive tourist commercial uses before the year 2000.

Revised Line A--The radio station is located some 330 feet from the selected alignment right-of-way; therefore, no businesses will be displaced by the selected alignment.

No Build Alternative—No businesses would be displaced if Route 199 is not constructed.

5.3.7 Tourism

Alignments A, A-1, A-2 Revised Line A and D--As stated earlier, retail commercial establishments concentrated at Lightfoot are unique in that they cater primarily to tourists, many of whom travel to the area solely to shop at the discount stores. Construction of the 4-lane Route 199 between I-64 and Route 60 is expected to induce additional retail and motel development which would cater largely to the discount shopper trade. This new development would be dependent upon the improved access and visibility afforded by Route 199.

A high degree of cross-visitation exists between major study area tourist attractions; Colonial Williamsburg, Busch Gardens and Jamestown Festival Park, and the Lightfoot area discount stores. Although dependent upon traffic loads encountered, it is not likely that tourists traveling between the Colonial Williamsburg/Busch Gardens areas and Lightfoot outlets would use Route 199 because neither Alignments A or D would offer the quickest, most direct travel route between these two points. Construction of any of the Route 199 alignments would facilitate tourist travel on Route 60, in particular, by providing a bypass route for James City County residential traffic.

Tourists traveling between Lightfoot and Jamestown and from the numerous campgrounds located near Jamestown in the southwest part of the County would be expected to use Route 199, however. An indirect benefit to tourism created by either alignment would be reduced traffic volumes on the roads in and around Williamsburg and on Route 60 in particular.

No Build Alternative--The No-Build Alternative would not reduce traffic volume around Williamsburg and Route 60. Instead, Route 60 would continue as the prime connector route between the major area tourist attractions. Therefore, the No-Build Alternative would not facilitate tourist travel and access to existing as well as newly created businesses.

5.3.8 Property Tax Impact

The following analysis is based upon a $0.67 real estate tax rate per $100 of assessed value for James City County and $0.66 real estate tax rate for York County. Total right-of-way tax estimating costs were taken from Form A-131A, RW 238, line 1h.

Alignment A--A real estate tax loss of $14,994.00 would occur with construction of this alignment. This amount is based upon a "taking" of a total of 70 parcels of land at a total right-of-way taking estimated cost of $2,951,935.00.

Minimal depreciation in property values will result from construction of this alignment. Those properties that would receive negative effects from the roadway would be the residential properties adjacent to the road in the Mooretown area at Lightfoot and along Ironbound Road.

Overall, the depreciation in some residential properties will be more than compensated for by the dramatic increase in property values that have already begun to occur in the Route 646 corridor as land is rezoned to a higher use. The commercial and industrial development which may occur on the several large areas near Route 60 (Warhill Tract and Eastern State Hospital property) in the James City County portion of the Alignment A corridor would significantly contribute to the County's goal to increase its nonresidential tax base.

The municipal cost associated with the urban growth included by Alignment A would be, in the case of York County, the cost of providing water and sewer extensions to the Route 646 area. In James City County, the municipal cost would be relatively less for Alignment A than Alignment D due to the fact that utilities already serve a large portion of the corridor. Certainly the costs (utility, road, schools) associated with potential large-scale residential development is higher.

Both James City County and York County could expect to receive a proportionate gain in revenue from the construction of Alignment A.

Alignment D--A real estate tax loss of $11,509.00 would occur with construction of Alignment D. This is based upon a "taking" of 69 parcels of land at a total right-of-way taking estimate of $2,173,351.00.

It is not likely that construction of Alignment D will result in depreciated property values of homes in Windsor Forest, Ford's Colony or Canterbury Hills, which parallel the roadway. The improved access to these subdivisions would offset the noise- and aesthetic-related negative effects.

As in the case of Alignment A, property values of undeveloped land in particular would be expected to escalate in the Alignment D corridor, both in York and James City Counties. Municipal costs for York County would be roughly the same for A and D. In James City County, however, municipal costs to service the development induced by Alignment D would be expected to be significantly higher than costs associated with Alignment A. While the D corridor falls inside the County's "Primary Service Area," development would be less concentrated than planned and utility expansions to the westernmost edge of the "Primary Service Area" would be required earlier than planned, thus possibly creating an economic hardship for the County.

It is felt that, given the size of Route 199 in each jurisdiction, both York and James City Counties would receive a proportionate share of revenue gain from construction of Alignment D.

Alignment A-1--An estimated tax loss of $16,905.00 would occur if this alignment were constructed. This is based upon a "taking" of 73 parcels of land and a total right-of-way taking estimate of $3,295,890.00.

Characteristics of these takings are similar to those of Alignment A except for the addition of three parcels.

Alignment A-2--A real estate tax loss of $13,652.00 would result with the construction of Alignment A-2. This is based upon a "taking" of 59 parcels of land and a total right-of-way taking estimate of $2,731,055.00.

The southern section of A-2 is the same as Alignment A. A-2 diverges from Alignment A between Route 603 and I-64.

Revised Line A--Based on a November 1986 estimate of tax loss conducted by VDOT, the selected alignment will have an estimated $13,900 loss of real estate revenue.

No Build Alternative--Depreciations and escalations of land described for the build alternatives would not be realized should the construction of Route 199 not take place.

5.4 COMMUNITY FACILITIES

Alignment A and Revised Line A--It is important to note that James City County has intentionally planned and sited many of its new community facilities within easy access to Alignment A and Revised Line A (see Figure 5-1). However, in the case of the recently-completed fire station location of Route 658 (Old Towne Road), direct access to Alignment A via a ramp would not be provided. Current residential development is concentrated in an

east-west direction along Longhill Road (from the Williamsburg City line out to Ford's Colony) and northward to Route 60. Alignment A would not offer the most direct route to reach these areas from the fire station on Route 658. Emergency access would be enhanced by Alignment A and Revised Line A for the residential and commercial growth which would be expected to occur over the long term in the corridor between Longhill and Ironbound Roads. In order to access Alignment A or Revised Line A, however, vehicles from this fire station would have to first travel west on Old Towne Road and then proceed south on Longhill Road to its intersection with the selected alignment.

Given the above considerations, construction of a special emergency access to these alignments is proposed at Old Towne Road. Response time to the Lightfoot area would be significantly reduced with Alignment A or Revised Line A, which would permit emergency vehicles to bypass the Route 60 corridor. A second fire station in the corridor exists at the present terminus of Route 199 at Route 5. The County Public Facilities Plan proposed a new fire station to be built at Lightfoot. Alignments A, A-1, A-2 and Revised Line A would directly serve this facility.

Alignment A and Revised Line A would improve access County-wide to the three James City County-Williamsburg public schools that exist currently in the corridor vicinity: Lafayette High School, James Blair Intermediate School and Berkeley Elementary School. The high and intermediate schools in particular would benefit from access to a major thoroughfare. Students must be transported county-wide to and from these facilities and it is preferable for them to be transported along four-lane-grade-separated roadways.

The distance of Lafayette High School from Alignment A, A-1, A-2 and Revised Line A would increase the benefit in terms of time and access. Additionally, two sites are planned for schools and may benefit from the construction of Route 199, one of these is located within the Ford's Colony development and one south of Route 5 along Centerville Road.

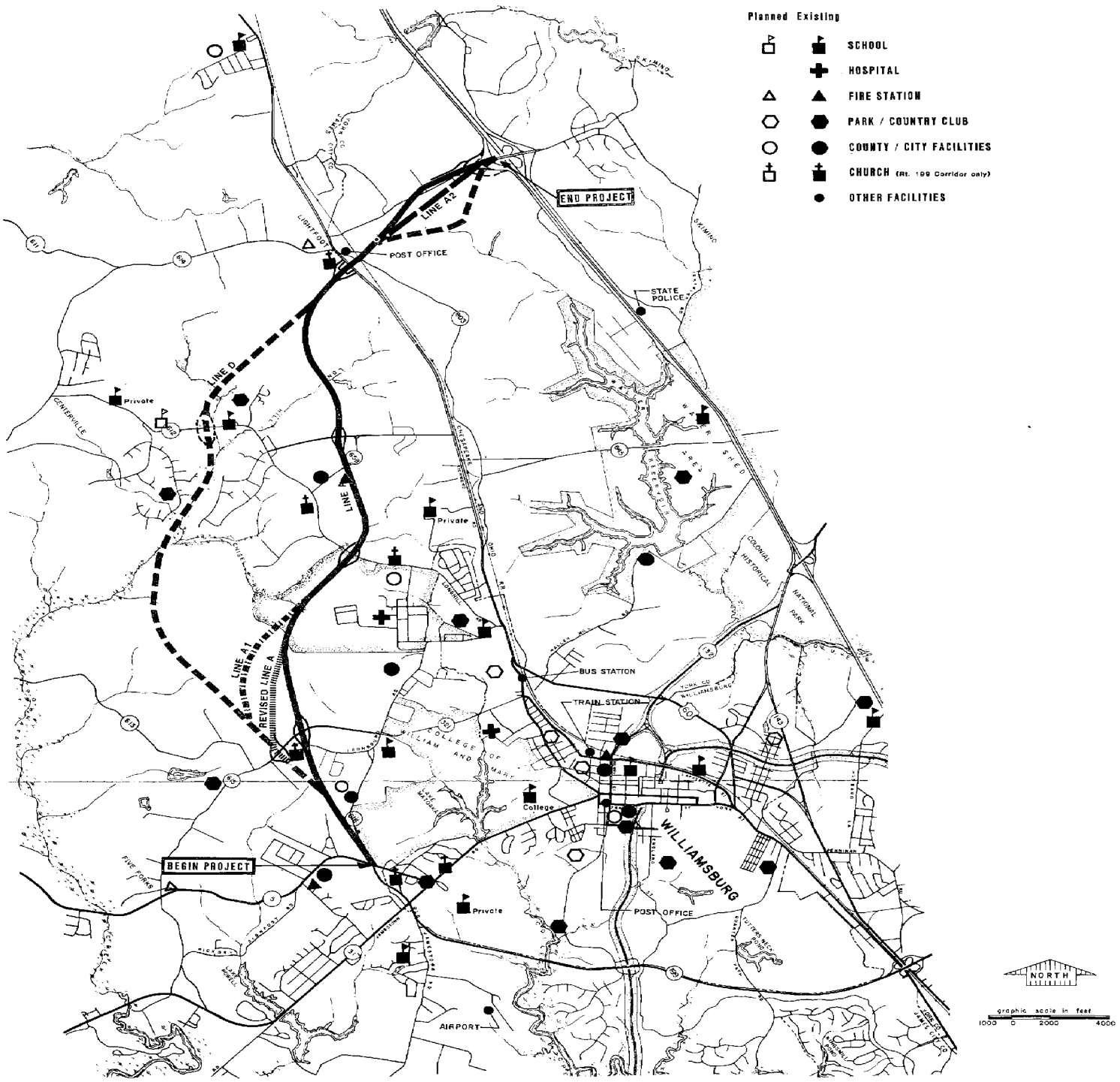
County-wide access to the newly-constructed James City County Human Service Center on Old Towne Road west of the new fire station and Social Services building on Towning Road (west of Ironbound Road) will be enhanced by Alignment A and Revised Line A.

FIGURE 5-1

EXISTING AND PLANNED COMMUNITY FACILITIES

ROUTE 199 CORRIDOR

JAMES CITY AND YORK COUNTIES
VIRGINIA



Construction of Alignment A or Revised Line A would not adversely impact existing active and passive recreational areas. Vehicular access to the York River State Park and the federal and state parks at Jamestown would be facilitated by the roadway. In James City County, the school sites described above are used for public recreation facilities and, thus, access would be improved to these three sites. A new County park under development on Ironbound Road west of Route 613 will benefit from Alignment A or Revised Line A. Since no national, state, or local park properties, historic, recreational, or wildlife refuge 4(f) lands are located in or immediately adjacent to the project limits, there will be no usage of 4(f) lands. Therefore, FHWA has determined that Section 4(f) does not apply to Revised Line A, the selected alignment.

Several churches exist close to the alignment: Zion Baptist Church located at the corner of Route 60 and Route 614 (Centerville Road) and the Mount Pleasant Baptist Church. Both churches serve the older black communities nearby.

Zion Baptist Church is located on a small parcel between Route 614 and the selected alignment Mount Pleasant Baptist Church, located on the western side of Alignment A and Revised Line A, would be separated from the Indigo Terrace and Strawberry Plains community which it serves. In both cases, construction of a major thoroughfare so close to the buildings could diminish enjoyment of these facilities. Also, pedestrian access to these churches would be limited severely from the east by Alignment A or Revised Line A.

Zion Baptist Church and Mount Pleasant Baptist Church serve approximately 600-700 persons combined. According to the survey returned by Zion Baptist Church, a very small part of the church membership, approximately 20-25 persons, walk to the church from their homes (See Appendix A). Vehicular access will be provided to Mount Pleasant Church off Ironbridge Road (Route 615). Residents west of the Revised Line A must travel east on Monticello Avenue extended to Ironbridge Road to access Mount Pleasant Baptist Church. The Revised Line A will not affect the Route 60 or Route 614 access to Zion Baptist Church.

Alignment D--Alignment D would greatly facilitate access from the existing fire station located at the Route 199/Route 5 intersection to the existing residential developments in the central County and to the additional development which would be expected to accompany construction of Alignment D. County plans to construct another fire station at Lightfoot would also benefit from the access afforded by Alignment D.

Lafayette High School would be provided direct access to the alignment via the Longhill Road interchange. This improved access would reduce the time and cost associated with busing students to and from this facility.

Existing recreation areas would not be adversely impacted by Alignment D. This alignment would provide slightly improved access to the new County park under construction on Ironbound west of Route 613. Since no national, state, or local park properties are located in or immediately adjacent to the project limits, there will be no usage of historic, recreational or wildlife refuge 4(f) lands. Therefore, FHWA has determined that Section 4(f) does not apply to Alignment D.

No Build Alternative--Community facilities will not be impacted if Route 199 is not constructed.

5.5 CONSERVATION

5.5.1 Agricultural Lands

The major impacts to agricultural lands will be via direct conversion of existing cultivated fields and pasture acreage for roadway usage. Depending upon the alignment ultimately selected, direct loss of agricultural lands is from 22.0 acres for Alignments A, Revised Line A and D, 27.0 for Alignment A-2, and 26.0 for Alignment A-1. Losses to agricultural lands have been coordinated with the Soil Conservation Services, in compliance with the Farmland Protection Policy Act. The completed Form AD1006 is included in Appendix G.

5.5.2 Forests

The proposed highway construction can be expected to adversely affect portions of both the existing upland and bottomland forest communities. Impacts include the direct elimination of forest habitat as well as indirect impacts associated with changes in moisture regimes, peripheral changes in light and temperature conditions and the creation of newly established edge communities.

Alignments A and A-2 would result in the direct loss of 157.4 acres of forest. Approximately 93 percent of the forestland reduction would be upland forest with the remainder being bottomland forest. Alignment A-1 or Revised Line A would result in the direct loss of 158.4 acres of forest, with approximately 94 percent of those acres in upland forest. Alignment D would eliminate a total of 186.8 acres of combined upland/bottomland forest community (see Table 5-1).

5.5.3 Terrestrial Wildlife/Habitat

Impacts to wildlife resources within the study area will primarily be due to habitat losses and alterations, especially those of upland and wetland forests.

In addition, the highway will serve to potentially alter movements of the more mobile wildlife species, notably deer. Obviously, the number of roadkills will increase with the initiation of highway usage.

Impacts to terrestrial resources constitutes the greatest acreage loss of any habitat type in the study area. While these losses are not given the high priority usually assigned to other habitats (e.g. wetlands) measures can be taken to minimize impacts to these resources. Mitigative alternatives include strict adherence to state erosion and sedimentation controls, selective clearing and grubbing, selective seeding of native herb, shrub, and tree species typical of the habitats impacted, restrictions in the use and time of application of herbicides,

Table 5-1
Direct Acreage of Terrestrial Habitat Lost
for
Each Alignment by Habitat

Habitat	Alignment			
	A	A-1/Revised Line A	A-2	D
Forest				
Upland	146.8	149.5	146.8	164.5
Bottomland	10.6	8.9	10.6	22.3
Pasture	10.3	10.3	11.2	19.0
Cultivated Field	11.9	11.9	14.7	8.3
Cutover Forest	2.4	0.0	2.4	0.0
Transmission Corridor	2.1	2.1	2.1	0.9
Developed				
Roadside	6.9	6.9	6.9	7.1
Residential/Commercial	13.7	13.7	--	24.3
	204.7	203.3	208.0	246.4

Source: ESE, 1985.

use of selective mowing to maintain ecotone and habitat diversity, use of right-of-way fencing, and minimal clearing of the right-of-way.

5.5.4 Threatened/Endangered Species

A population of the small-whorled pogonia (Isotria medeoloides), a federally listed endangered species, presently exists approximately 90 feet from the right-of-way of Alignment A. Highway construction at such close proximity is expected to alter edaphic conditions such that negative impacts to the colony will result. Edaphic changes which may occur include alterations in drainage, temperature and light changes, increased competition with edge species and inadvertent effects on essential microrhizal communities.

Impacts cannot be reduced by transplantation as past attempts to relocate I. medeoloides have failed. Highway impacts to the small-whorled pogonia population will be associated with Alignments A and A-2 only. Based upon coordination with the USFWS, a biological assessment responding to Section 7 of the Endangered Species Act of 1973 will be required if Alignment A is selected for highway development. Official statements to this effect from USFWS dated July 9, 1985 and October 9, 1985 are included in the Water Resources and Ecology Technical Report.

In response to the Fish and Wildlife Service recommendations, Alignment A-1, which would avoid adverse impacts on Isotria medeoloides, has been reintroduced. Subsequent to the public hearing, a further refinement of Alignment A, Revised Line A, was introduced to minimize the impact on Isotria medeoloides and reduce project costs. A discussion of this alignment is found in Section S-5 of this report. A Section 7 biological assessment was conducted to assess the effect of Revised Line A on Isotria medeoloides. This assessment is included in Appendix D.

5.6 CULTURAL RESOURCES

5.6.1 Architectural Resources

With the exception of the Lane Farm, all sites identified in the general project area are too far away to be impacted by any of the proposed alignments. The Lane Farm structure and outbuildings are in a dilapidated condition and are not on current lists or eligible for nomination to the National Register. Due to these reasons and in conjunction with the Virginia Division of Historic Landmarks (VDHL), it was determined that no significant historic sites will be affected by any of the proposed Route 199 alignments (see Appendix C).

5.6.2 Archaeological Resources

Available archaeological evidence for the project area indicates that the Peninsula was probably populated for at least 12,000 years; but, in general, its prehistory is poorly understood relative to many other regions of Virginia.

The number of significant sites potentially impacted by the project are virtually the same no matter which alternative is chosen, 19 for Alignment A (including A-1, A-2 and Revised Line A) and 17 for Alignment D.

The Phase I Archaeological Reconnaissance Survey were conducted within the project area. Recommendations were made to the State Historic Preservation Officer (SHPO) for Phase II Significance Assessment Survey in light of guidelines developed by the U.S. Department of Interior as part of the National Register nomination process. Appendix C shows a letter stating VDHL's concurrence with this recommendation.

Phase II archaeological examination of fourteen sites located within the proposed Route 199 extension corridor (Alternate A, Revised Line A and A-2), has determined that six sites are eligible to the National

Register of Historic Places. These six sites will be destroyed by construction of the Route 199 extension. These sites which are shown on Figure 4-7 are:

A-3 - 18th-century mill with prehistoric component
A-8 - Prehistoric site
A-12 - Prehistoric site
A-13 - Prehistoric site
A-16 - Prehistoric site
A-17 - Prehistoric site

A Section 106 document is included in Appendix C to document coordination with the Executive Director of the Advisory Council on Historic Preservation.

In order to mitigate the adverse effect of the project on these resources, Phase III archaeological data recovery is required. The purpose of this final phase of work is to retrieve representative categories of archaeological data which contribute to the eligibility of the six sites. Retrieval of significant information will be accomplished through a combination of intensive excavation, documentation, laboratory analysis and report writing. In addition, intensive paleo-ecological testing will be conducted as part of this work in order to reconstruct the changing environmental context of the prehistoric sites within the project area. Further documentary research to the eligible historic site will also be conducted.

The prehistoric resources within the project corridor afford an unprecedented opportunity to understand a previously neglected aspect of the cultural development of the James -York peninsula and surrounding region. Phase II site examination has indicated the presence of stratified deposits, hearth and possibly storage features, limited organic preservation, and horizontal separation of functional activities within five prehistoric sites. Preliminary analysis of these sites indicate that they represent the remains of seasonally-occupied resource procurement sites with components ranging from the Late

Archaic period (2000 - 1200 B.C.) to the Late Woodland period (900 - 1600 A.D.). The preliminary data also suggest that the interior areas of this portion of the James-York Peninsula were most intensively utilized during the Middle Woodland period (500 B.C. - 900 A.D.).

The Phase II investigations of the proposed Route 199 corridor also examined eight historic-period archaeological sites. Only one of these sites appeared to be eligible to the National Register: Site A-3. The mill complex consists of an earthen dam 280 feet in length and 8 feet in height, two large borrow pits, and the mill headrace.

The mill site (Site A-3) may provide very important historical and archaeological information relevant to the milling process as practiced on large plantations in James City County in the early--to--mid-18th century. To date, no site of its kind has yet been investigated on the James-York Peninsula and perhaps the entire Virginia Tidewater area. Considering the documentary evidence of Indigo cultivation within the immediate vicinity of the site, the conditions under which the crop is grown, and the prominence of the grower, a great deal may be learned about the local cultivation and process of a valued crop during the colonial period. For these reasons, the site is considered eligible for nomination to the Register of Historic Places.

In addition, a small prehistoric component at this location is considered important due to the deeply buried nature of Archaic-period components. However, much of the area has been previously disturbed by the 18th century borrow pits. An adequate sample of these prehistoric resources can be recovered as part of the data recovery for the historic component at the site.

5.7 AIR QUALITY

An air quality assessment was conducted to analyze potential impacts on air quality from the proposed Route 199. The years studied in this analysis were 1990 and 2010. The air quality impacts were evaluated for the No Build and Build Alternatives.

Emitted pollutants associated with vehicular projects include airborne lead, hydrocarbons, nitrogen oxides, total suspended particulates, sulfur oxides, and carbon monoxide. The project area is in attainment for all of the above pollutants.

Increasingly stringent EPA regulations governing lead concentrations in gasoline are resulting in significantly lower airborne lead levels. Therefore, major vehicle lead emissions due to the project are not expected and any emitted concentrations will not have a significant impact upon the environment.

Photochemical reactions involving HC and NOx in the air can result in ozone. Because of the complex reactions and atmospheric transport involved in ozone formation, no models are available which accurately predict ozone on a microscale level.

Carbon monoxide (CO), a stable gas, is the predominant pollutant emitted by motor vehicles. Since CO is relatively nonreactive, its microscale dispersion from a roadway to adjacent receptors can be accurately predicted with computer models. Therefore, CO was chosen as a quantifiable indicator to assess project impacts on the air quality.

5.7.1 Microscale Analysis

A microscale analysis was performed to determine CO concentrations in the immediate vicinity of a street or highway. After a thorough and comprehensive review of traffic volume data and site plans, five receptor sites were selected for the analysis. These sites represent locations where the highest CO levels are expected in association with the project. The receptor site locations are shown in Figure 5-2. Receptor 1 is located on the right-of-way at the proposed signalized intersection of Route 199 and Route 646 for Alignment A. The review of the traffic data for the Alignments A, A-1, A-2 and D indicated that the projected traffic volumes were highest for Alignment A at this intersection. Therefore, Alignment A would represent the worst case. Projected CO values would be less for the intersections of Route 646 and Alignments A-2 and D than for Alignment A. Receptor 2 is located on the right-of-way at the proposed signalized

intersection at the Route 60/Route 199 interchange. This signalized intersection is common to alignments A and D and was therefore analyzed for both alignments. Receptors 3 and 4 represent the impacts of Alignments A and D respectively, under free flow traffic conditions. Receptor 5 is located at the existing signalized intersection of Route 5 and Route 199. This intersection was analyzed for both the A and D Alignments.

The TEXIN model was used to predict CO concentrations for the various scenarios at the signalized intersections. MOBILE3 and CALINE3 were used to predict CO concentrations for the free flow traffic conditions at Receptors 3 and 4. Both the TEXIN and CALINE3 models estimate CO concentrations based on roadway configuration, traffic parameters, emission factors, and meteorology of the area. In addition, TEXIN allows for signal parameter inputs to account for deceleration, acceleration and idling of vehicles due to signalization.

Since maximum concentrations from ground-level sources such as automobiles occur under light winds and stable atmospheric conditions, a wind speed of 1 m/sec and stability Class E were used in computing maximum one-hour concentrations. Because peak-hour data were used, the model output corresponds to the worst-case 1-hour maximum concentrations. The average hourly traffic for the peak 8-hour period was determined to be approximately 90 percent of peak-hour traffic. Therefore, 8-hour concentrations were calculated by taking 90 percent of peak-hour concentrations. These values were then multiplied by an 0.6 meteorological persistence factor since it is unlikely that worst case 1-hour meteorological conditions would persist for 8 hours (EPA, 1978). Carbon monoxide concentrations occurring in the immediate vicinity of the street or highway are the result of concentrations directly attributable to the nearby roadways plus a background component that is attributable to other emission sources including more distant roadways. Since there are no CO monitors in the project area, the CO background concentrations were assumed to be 6.0 ppm for 1-hour and 3.0 ppm for 8-hour

FIGURE 5-2

AIR QUALITY RECEPTOR LOCATIONS
ROUTE 199 CORRIDOR

JAMES CITY AND YORK COUNTIES
VIRGINIA

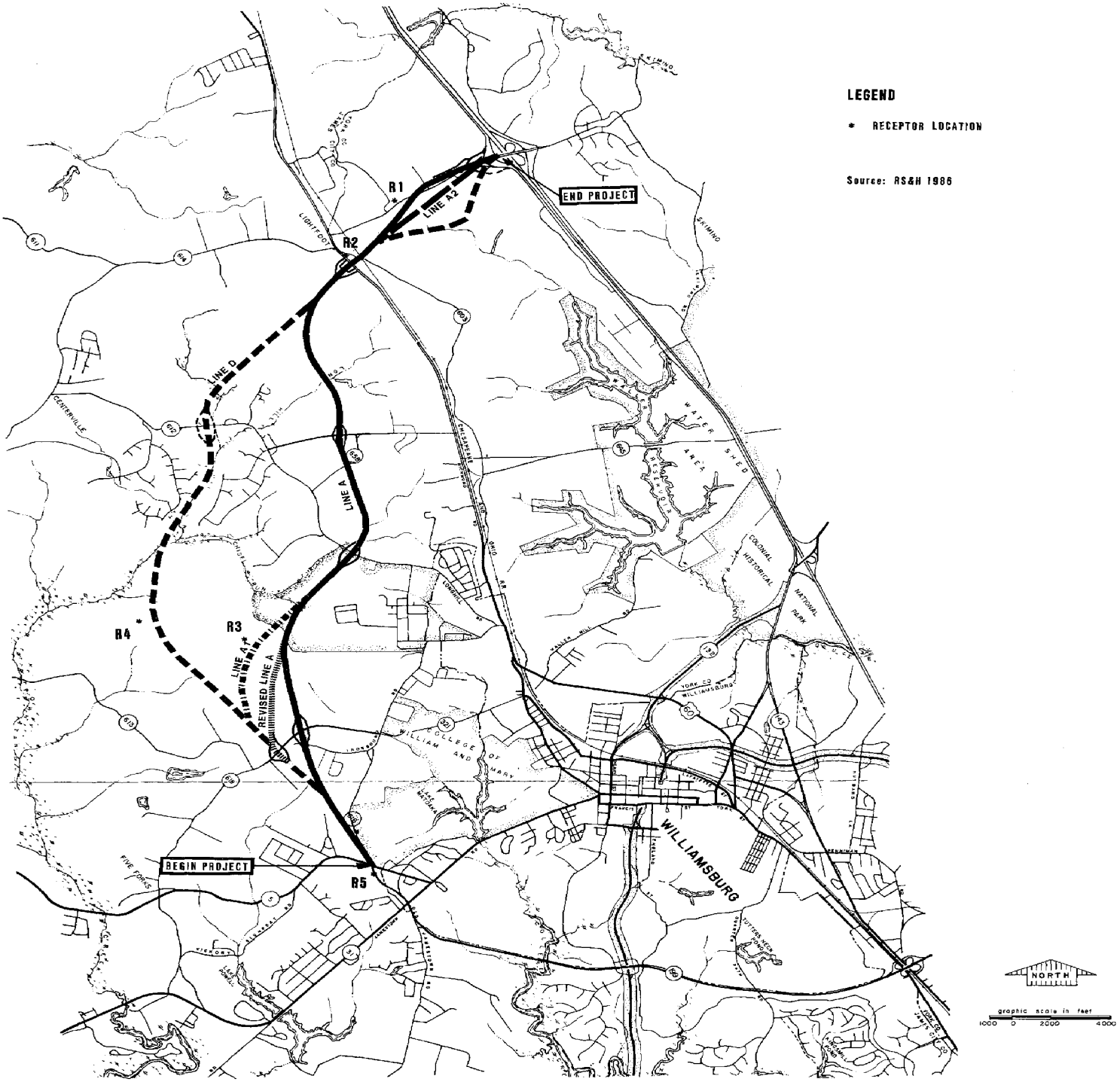


Table 5-2
Maximum 1-Hour and 8-Hour Predicted Carbon Monoxide Concentrations (ppm)*

		No Build		Build			
				Alignment "A"		Alignment "D"	
Year	Receptor	One-Hour CO Levels	Eight-Hour CO Levels	One-Hour CO Levels	Eight-Hour CO Levels	One-Hour CO Levels	Eight-Hour CO Levels
1980	1	6.1	3.1	--	--	--	--
	2	7.9	4.0	--	--	--	--
	3	6.0	3.0	--	--	--	--
	4	6.0	3.0	--	--	--	--
	5	16.1	8.5	--	--	--	--
1990	1	6.2	3.1	11.9	6.2	--	--
	2	7.4	3.8	14.1	7.4	12.4	6.5
	3	6.0	3.0	6.3	3.1	--	--
	4	6.0	3.0	--	--	6.3	3.2
	5	12.9	6.7	14.0	7.3	11.9	6.2
2010	1	6.2	3.1	12.9	6.5	--	--
	2	7.8	4.0	14.7	7.7	12.0	6.2
	3	6.0	3.0	6.4	3.2	--	--
	4	6.0	3.0	--	--	6.4	3.2
	5	13.9	7.3	14.1	7.3	12.0	6.2

*Includes background.

Source: RS&H, 1985

concentrations. These values are considered to be a reasonable estimate of CO background for rural areas with limited land use development.

Table 5-2 presents the total CO concentration projections at each receptor site for the base year (1980), 1990 and 2010 for various

alignments for both the Build and No Build Alternatives. The 1-hour and 8-hour background levels were added to the computer predictions to obtain 1-hour and 8-hour total concentrations. The highest predicted one-hour values are 13.9 ppm for the No Build Alternative and 14.7 ppm for the Build Alternative. The highest predicted 8-hour values for the No Build and Build Alternatives are 7.3 ppm and 7.7 ppm, respectively. All of these values are well below the State and National Ambient Air Quality Standards of 35 ppm for 1-hour and 9 ppm for 8-hour concentrations. Generally, the predicted values are lower for Alignment D than for Alignment A. This is due to the lower peak-hour traffic volumes associated with Alignment D.

The largest increases attributable to the project are at Receptors 1 and 2 which are both located at proposed signalized intersections. The Alignment D alternative would result in an improvement at Receptor 5 due to diversion of some of the traffic. The project is not expected to interfere with the attainment or maintenance of the National Ambient Air Quality Standards.

5.7.2 Conformance with the State Implementation Plan

This project is an area where the State Implementation Plan (SIP) does not contain any transportation control measures. Therefore, with the exception of construction requirements, the conformity requirement of 23CFR770 does not apply.

5.8 ENERGY

An analysis of the energy consumption was performed for the alternatives studied for Route 199 in Williamsburg, Virginia. The evaluations included an

assessment of direct and indirect energy requirements for each alternative. An analysis period from 1990 to 2010 was used in the evaluation.

The energy consumption was estimated using procedures outlined by Messrs. Apostolos, Shoemaker, and Shirley. The procedure calculates the direct energy consumed by vehicles, indirect energy consumed in vehicle manufacturing and maintenance, and energy consumed in construction and maintenance activities. The Energy Analysis Technical Report, which was prepared in conjunction with this document, discusses the procedure in detail.

The alternatives analyzed for energy impacts were the No Build Alternative, Alignment A-1, and Alignment D. As discussed in the Technical Report, Alignment A-1 is representative of all the "A" Alignments.

The annual energy consumption for each alternative is summarized in Table 5-3. The total consumption represents the average annual consumption over the 20-year analysis period. As seen in Table 5-3, the build alternatives require less energy than the No Build Alternative. This is due to the free-flow conditions on Route 199 and the lower level of congestion. It should be noted that there are a number of capacity deficiencies in the street system in the No Build Alternative and that a number of roadway improvements would need to be made to accommodate the projected volumes. The energy consumed in the construction and maintenance of the improvements have not been included in this analysis. Thus, the No Build energy requirements are understated.

The Alignment A and D build alternatives will require 6.6 and 8.1 percent less energy, respectively, than the No Build Alternative. This is a significant energy savings. Alignment D will require approximately 1.6 percent less than Alignment A, however, this is not considered to be a significant savings. Therefore, while the build alternative improves energy consumption, one alternative is not clearly superior to the other.

Table 5-3
Annual Energy Consumption

Type of Energy	Alternative		
	No Build	Alignment A-1 (Revised Line A)	Alignment D
Direct Vehicle[1]	2,277.3	2,080.9	2,069.8
Indirect Vehicle[1]	1,982.5	1,865.3	1,811.5
Maintenance[1]	35.4	42.0	42.6
Construction[1]	0.0	22.3	23.0
TOTAL	4,295.2	4,010.5	3,946.9
Barrels of Oil/Day[2]	2,029	1,894	1,864

[1]In millions of BTUs.

[2]One Barrel of Oil is equal to 2.117×10^6 BTU.

Source: Harland Bartholomew & Associates, Inc., 1985.

5.9 NOISE IMPACTS AND MITIGATION

5.9.1 Noise Impact Assessment

Based upon the forecast methodologies discussed in Section 4, sound levels for ambient and design year (2010) Build and No Build scenarios were calculated, and the results have been summarized in Tables 5-4 to 5-7. For simplicity, the anticipated impacts upon the receptors will be discussed and compared by two major alignments: A and D. The Revised Line A, A-1 and A-2 Alignments will be discussed separately. Since the publication of the DEIS, a more refined analysis was made of the noise impacts. These changes are reflected in this portion of the text.

Alignment A--Assessment of Alignment A considered the anticipated noise impacts upon 16 sites that have been identified as being noise sensitive. From Table 4-7, it is observed that the sites are either residential or public, semi-public in nature.

Analysis of the table indicates a substantial increase in noise levels at nine sites, with noise levels at two of these sites equalling or exceeding the Noise Abatement Criteria (NAC) of 67 dBA. The interior NAC of 52 dBA will not be exceeded at either of two churches located along this alignment, Mount Pleasant (Site 2A-2) and Zion Baptist (Site 7A-2). The latter is air-conditioned, allowing closed window conditions year round. Overall, Alignment A will impact a total of 129 residential receptors.

Alignment D--The results of the analysis of 21 sites representing this alignment indicate that a substantial increase in noise levels will occur at ten sites including Lafayette High School (Site 5D-1). The exterior NAC of 67 dBA will be equalled or exceeded at two of the ten sites. The interior NAC will not be exceeded at Lafayette High School, Mount Pleasant or Zion Baptist Church. A total of 147 residences and

Table 5-4
Noise Levels and Anticipated Impacts
Alignments A and A-1

Site No.	Condition	Noise dB(A)
1A-2	Existing	48
	No Build	52
	Build	64
1A-3	Existing	45
	No Build	50
	Build	67
2A-1	Existing	45
	No Build	50
	Build	61
2A-2	Existing	57
	No Build	59
	Build	60
2A-3	Existing	52
	No Build	58
	Build	63
2A-4	Existing	45
	No Build	47
	Build	54
2A-5	Existing	45
	No Build	47
	Build	48
3A-2	Existing	45
	No Build	53
	Build	58
4A-2	Existing	45
	No Build	45
	Build	53
5A-1	Existing	45
	No Build	45
	Build	60

Table 5-4
(Continued)

Site No.	Condition	Noise dB(A)
7A-1	Existing	56
	No Build	65
	Build	68
7A-2	Existing	61
	No Build	62
	Build	63
7A-3	Existing	61
	No Build	64
	Build	66
8A-1	Existing	61
	No Build	62
	Build	60
8A-2	Existing	56
	No Build	58
	Build	66
8A-3	Existing	50
	No Build	53
	Build	62

(Source: Virginia Department of Transportation, December 1988.)

Table 5-5
Noise Levels and Anticipated Impacts
Alignment D

Site No.	Condition	Noise dB(A)
1D-1	Existing	57
	No Build	59
	Build	61
1D-2	Existing	45
	No Build	47
	Build	56
1D-3	Existing	52
	No Build	58
	Build	52
1D-4	Existing	45
	No Build	50
	Build	53
1D-5	Existing	48
	No Build	52
	Build	59
1D-6	Existing	45
	No Build	50
	Build	61
2D-1	Existing	45
	No Build	45
	Build	52
2D-2	Existing	45
	No Build	45
	Build	54
2D-3	Existing	45
	No Build	47
	Build	57
3D-1	Existing	45
	No Build	46
	Build	61
3D-2	Existing	45
	No Build	46
	Build	60
3D-3	Existing	45
	No Build	45
	Build	59

Table 5-5
(Continued)

Site No.	Condition	Noise dB(A)
3D-4	Existing	45
	No Build	45
	Build	60
4D-1	Existing	51
	No Build	58
	Build	55
4D-2	Existing	54
	No Build	61
	Build	61
5D-1	Existing	45
	No Build	47
	Build	57
5D-2	Existing	61
	No Build	62
	Build	63
5D-3	Existing	56
	No Build	65
	Build	68
5D-4	Existing	61
	No Build	64
	Build	67
7D-1	Existing	47
	No Build	49
	Build	61
7D-2	Existing	61
	No Build	62
	Build	60

(Source: Virginia Department of Transportation, December 1988.)

Table 5-6
Noise Levels and Anticipated Impacts
Revised Line A

Site No.	Condition	Noise dB(A)
1A-3	Existing	45
	No Build	50
	Build	66
2A-1	Existing	45
	No Build	50
	Build	58
2A-2	Existing	57
	No Build	59
	Build	64
2A-3	Existing	52
	No Build	58
	Build	55
2A-4	Existing	45
	No Build	47
	Build	59
2A-5	Existing	45
	No Build	47
	Build	53

(Source: Virginia Department of Transportation, December 1988.)

Table 5-7
Noise Levels and Anticipated Impacts
Alignment A-2

Site No.	Condition	Noise dB(A)
A2-1	Existing	61
	No Build	62
	Build	60
A2-2	Existing	56
	No Build	59
	Build	64
A2-3	Existing	50
	No Build	53
	Build	66
A2-4	Existing	47
	No Build	49
	Build	60
A2-5	Existing	51
	No Build	53
	Build	57

(Source: Virginia Department of Transportation, December 1988).

the exterior activity area at Lafayette High School will be impacted by Alignment D.

Revised Line A--This variation of Alignment A occurs at the southern end of the project (Sites 1A-3 and 2A-1 thru 2A-5) and also at the northern end where it follows Alignment A-2. Revised Line A, including the portion which follows Alignment A, is represented by 18 sites, nine of which will receive substantial increases in noise levels. Only one of the nine sites will experience noise levels that exceed exterior NAC. Mount Pleasant Church will receive interior noise levels which exceed the NAC of 52 dBA under open window conditions. Because the church is not air-conditioned, closed window conditions cannot be maintained year round. Revised Line A will impact a total of 123 residential receptors and the church.

Alignment A-1--Generally, impacts from the beginning of Alignment D, from Site 1D-1 to 2D-3, and continuing on Alignment A, from Site 3A-2 to 8A-3, are the same impacts that may be anticipated for Alignment A-1. There were no separate sites identified for this alignment, since it proceeds generally through sparsely populated or unpopulated areas.

Based upon the analysis of the A and D Alignments, nine sites representing Alignment A-1 will receive substantial increases in noise levels, with one of the nine sites experiencing an exterior NAC violation. No interior violations will be experienced. Overall, 77 residential receptors will be impacted by Alignment A-1.

Alignment A-2--This alignment varies from Alignment A only at the northern end of the project, between Route 60 and I-64. Nine sites will receive substantial increases in noise levels, with two of the nine experiencing exterior NAC violations. None of the sites will receive interior NAC violations. Alignment A-2 will impact a total of 129 residences.

Comparison of Impacts by Alignment

Alignment	Impacts
A	129 residences
D	147 residences - Lafayette H.S. (exterior)
A Revised	123 residences - Mount Pleasant Church (interior)
A-1	77 residences
A-2	129 residences

Of the five alternatives studied, Alignment D will have the largest number of impacts, while Alignment A-1 will have the least.

5.9.2 Mitigation Measures

Various noise abatement measures have been considered for those receptors along the selected alternative, Revised Line A, which will experience substantial noise level increases and/or which will experience noise levels equalling or exceeding the NAC. A line shift would not be feasible, as there are noise sensitive receptors on both sides of the project throughout the proposed corridor. A line shift away from one receptor would only move the roadway closer to another receptor. Rerouting through trucks would not be practical, as this facility is designed as a bypass to relieve congestion and remove trucks from local roadways. The selected alignment has already been depressed where design opportunities exist. Further roadway depression is not reasonable. The construction of sound barriers of varying heights and lengths has been considered as a noise abatement measure at the impacted locations. Air-conditioning Mount Pleasant Church is also an abatement consideration. Table 5-8 summarizes the mitigation measures analyzed for the impacted receptors along Revised Line A.

Based upon FHWA/VDOT Noise Abatement Feasibility Criteria, a noise abatement measure is not considered reasonable if the cost per receptor protected exceeds $20,000. Therefore, the sound barriers at

Table 5-8
Mitigation of Noise Impacts for Revised Line A

Site No.	Impact	Mitigation Measure
1A-2	Substantial Increase	A sound barrier 1500 feet in length and 10 feet in height will provide 5 to 7 dBA attenuation to 8 single family residences at a cost of $240,000 or $30,000 per receptor. Barrier located west of Rt 199 from station 120 to station 135. Barrier not reasonable due to cost.
1A-3	Substantial Increase	A sound barrier 1300 feet in length and 15 feet in height will provide 5 to 10 dBA attenuation to 73 townhouses at a cost of $312,000 or $4,274 per receptor. Barrier located east of Rt 199 from station 132 to station 145. Barrier appears to be reasonable and feasible.
2A-1	Substantial Increase	A sound barrier 2600 feet in length and 15 feet in height will provide 5 to 6 dBA attenuation to 12 single family residences at a cost of $624,000 or $52,000 per receptor. Barrier located east of Rt 199 from station 133 to station 159. Barrier not reasonable due to cost. The sound barriers protecting sites 1A-3 and 2A-1 could be combined resulting in a barrier 2700 feet in length and 15 feet in height providing 5 to 10 dBA attenuation to 73 townhouses and 12 single family residences at a cost of $648,000 or $7,624 per receptor. Barrier located east of Rt 199 from station 132 to station 159. Barrier not reasonable due to cost of extending barrier to protect site 2A-1 ($28,000 per receptor).
2A-2	NAC Exceeded (Interior)	Mount Pleasant Church can be air-conditioned allowing closed window conditions year round, providing 10 to 15 dBA attenuation. Measure appears to be reasonable and feasible.
2A-4	Substantial Increase	A sound barrier 2300 feet in length and 9 to 12 feet in height will provide 5 to 7 dBA attenuation to 20 single family residences at a cost of $396,000 or $19,800 per receptor. Barrier located west of Rt 199 and Ramp A from Rt 199 station 143 to Ramp A station 10. Barrier appears to be reasonable and feasible.
3A-2	Substantial Increase	An effective sound barrier cannot be provided to protect 3 single family residences due to access requirements. An effective barrier must be continuous and not have openings for access.

Table 5-8
(Continued)

5A-1	Substantial Increase	A sound barrier 500 feet in length and 10 feet in height will provide 6 dBA attenuation to 2 single family residences at a cost of $80,000 or $40,000 per receptor. Barrier located east of Rt 199 and Ramp B from Ramp B station 13 to station 18. Barrier not reasonable due to cost.
7A-1	Substantial Increase and NAC Exceeded	A sound barrier 500 feet in length and 10 feet in height will provide 5 dBA attenuation to 2 single family residences at a cost of $80,000 or $40,000 per receptor. Barrier located south of Rt 199 from station 418 to station 423. Barrier not reasonable due to cost.
A2-3	Substantial Increase	A sound barrier 400 feet in length and 10 feet in height will provide 5 dBA attenuation to 1 single family residence at a cost of $64,000. Barrier located north of Rt 199 from station 449 to station 453. Barrier not reasonable due to cost.
A2-4	Substantial Increase	A sound barrier 800 feet in length and 10 feet in height will provide 5 dBA attenuation to 1 single family residence at a cost of $128,000. Barrier located south of Rt 199 from station 450 to station 458. Barrier not reasonable due to cost.

sites 1A-2, 2A-1, 5A-1, 7A-1, A2-3 and A2-4 and the extension of the barrier at site 1A-3 are not reasonable and will not be constructed. Barriers at sites 1A-3 and 2A-4 and the air-conditioning at Mount Pleasant Church are still under consideration. A final decision will be made upon completion of a detailed noise abatement analysis, the final project design and a public involvement process.

5.10 WATER QUALITY AND AQUATIC ECOLOGY

5.10.1 Hydrology

Changes in the hydrologic regimes of the streams in the study area can be expected due to several factors:

- Changes in watershed contours and vegetative cover;
- Increased amounts of runoff from highway surfaces;
- Stream crossings serve as points of some impedance to natural flows and runoff (especially during periods of culvert blockage); and,
- Alteration of stream bottoms at points of highway crossing.

Short-term impacts will be controlled to a great extent by following the Department's best management practices during construction. Potential long-term impacts can be alleviated by using proper culvert/stream crossing design. The existing watershed at the study area as well as the integrity of Waller Mill Reservoir will not be significantly altered by the proposed project.

5.10.2 Groundwater and Mineral Resources

No adverse short-term effects on groundwater supplies are expected with implementation of any of the alternative alignments. However, in the event that a well is discovered during construction activity, appropriate measures will be undertaken to seal the well in accordance with the rules and regulations promulgated by the State Water Control Board. Sealing the well will prevent future groundwater pollution.

Potential long-term impacts to the groundwater can be categorized as follows:

- Changes in recharge to aquifers;
- Pollution of aquifers; and
- Changes in usage of groundwater

Long-term impacts will be contingent upon the amount and type of development in the study area, due to the project.

Impacts may affect the recharge of the shallow Quaternary aquifer which obtains its water directly from precipitation. Due to the extensive area covered by the Quaternary it is expected that reductions in infiltration due to the impervious areas caused by development will have a negligable affect on the water level in the aquifer. Mitigation of this impact will not be required.

The Quaternary aquifer is susceptible to pollution from spills, land application of chemicals, land based solid and hazardous waste facilities, etc. Mitigation and minimization of this potential impact should include an active local spill response program for any spills occuring during transit, a spill contingency plan for industries on file with local authorities, and an active land based solid and hazardous waste siting and permitting protocol tied in with local planning requirements.

The Cretaceous aquifer may be more extensively used after development increases in the study area. An increase in pumpage within the areas expecting development will increase drawdown and may shift pumping centers farther to the west which could allow saline waters to enter current zones of freshwater. Prediction and/or early warning of the movement of saline waters into the freshwater areas of the aquifer are achieved by monitoring and modeling the Cretaceous aquifer.

No adverse impacts to mineral resources are anticipated with any alignment alternative. While some disruption of surficial sedimentary deposits may be expected, these impacts are not significant due to the vastness of like resources on the Coastal Plain.

5.10.3 Surface Water

Construction activities have the potential to increase sedimentation and turbidity levels of surface water resources in proportion to both their proximity to excavated sites and to the frequency of storm events during construction. After construction, vehicular usage will result in automobile-related pollutant loading into the surface waters, however; good traffic flow will reduce the amount. Although various surface water resources will be involved depending on alternative selection, the adverse effects to water quality will be the same.

Long-term impacts to water quality stem from increased pollutant levels reaching surface waters from motor vehicle traffic as well as from de-icing salts and herbicides applied for right-of-way maintenance. Significant levels of toxic heavy metal, asbestos and slowly biodegradable petroleum products and rubber are directly deposited from motor vehicles along with large quantities of particulate materials contributed indirectly by traffic. Traffic-related lead is deposited principally through the use of leaded fuels but some deposition results from the wear of tires in which lead oxide is used as a filler material.

All appropriate permits regarding impacts to surface waters and their associated floodplains will be applied through the interagency coordination process.

5.10.4 Aquatic Ecology

Aquatic habitats and their associated biota will be adversely affected to some degree by highway construction and subsequent usage. Potential impacts include:

- Water quality changes;
- Physical obstructions to the movement of organisms;
- Changes in substrate characteristics and other physical habitat features; and,
- Changes in hydrologic parameters, such as current velocity, depth and flood events.

Although numerous detrimental impacts to the water resource have been documented, the impact in many cases has been shown to be temporary (Chisholm and Downs, 1978; Barton, 1977; Reed, 1977). These studies have indicated that fish and benthic macroinvertebrate populations recover quickly after construction activities have been completed. These studies also show that strict erosion control and construction during dry seasons and after fish spawning, are effective in reducing impacts.

Various measures will be incorporated into roadway design and maintenance plans to reduce impacts to aquatic resources. While some impacts are likely to be temporary (changes in aquatic species composition, disruption of aquatic species), control measures will be employed that reduce the magnitude and duration of the impact. Such measures include, but are not limited to, the use of berms, dikes,

dams, sediment basins, fiber mats, straw silt barriers, netting, mulch, grasses and other methods. Temporary erosion and siltation control measures would be applied to areas highly susceptible to erosion such that silt loading and deposition in streams is minimized.

The use of single bottomless box culverts is planned throughout the project. These structures effectively reduce the potential for culvert blockage, provide a natural benthic substrate for organisms, and do not deter organisms' movements. This is particularly important for accommodating anadromous fish in the area.

Additional impact reduction measures available include proper scheduling of construction activities to avoid rainy months and seasons critical to organism reproductive cycles (fish spawning and insect emergence), minimizing construction activities in floodplains outside the designed right-of-way, and minimizing the degree to which unprotected soil is exposed during construction.

5.10.5 Wetlands

In accordance with Executive Order 11990, "Protection of Wetlands," this project has been evaluated to determine potential impacts to wetlands. Department compliance with EO 11990 is detailed in the Water Resources and Ecology Technical Report and Wetlands Delineation Appendix F. The selected alternative, Revised Line A was reviewed to determine if further shifts would be possible to reduce or minimize the wetlands required for development of the proposed project. A summary of this review is included in Appendix B. Assessment of impacts to wetlands was based on areas of direct effect, namely the area of wetland eliminated by filling and/or displaced by the highway alignment. Acreage losses for each alignment are summarized in Table 5-9. The selected alignment, Revised Line A, results in a loss of 12.17 acres as described on Table 5-10. Alignment D results in the greatest area of impact occurring in the

Table 5-9
Direct Wetland Losses Incurred by Alignments

Alignment	Wetland	Type*	Area of Primary Impact (acres)
A and A-2	Mill Creek	PFO1A	2.3
		PFO1A	0.7
	Chisel Run (W. of E. State Hosp.)	PFO1C	1.3
		PFO1C	1.7
	Chisel Run (N. of Route 612)	PFO1C	1.3
		PFO1E	1.5
	Chisel Run (at Longhill Rd.)	PFO1E	0.5
	Long Hill Swamp	PFO1A	1.5
	TOTAL		10.6
A-1	Mill Creek	PFO1A	1.1
A/A-1 A/A-1/A-2	Chisel Run (W. of E. State Hosp.)	PFO1C	1.3
		PFO1C	1.7
	Chisel Run (N. of Route 612)	PFO1C	1.3
		PFO1E	1.5
	Chisel Run (at Longhill Rd.)	PFO1E	0.5
	Long Hill Swamp	PFO1A	1.5
	TOTAL		8.9
D	Mill Creek	PFO1A	1.1
	Powhatan Creek Tributary 1 (N. of Route 615)	PFO1A	0.6
	Powhatan Creek Tributary 2 (N. of Tributary 1)	PFO1A	0.6
	Long Hill Swamp (S. of 612)	PFO1E	1.2
	Long Hill Swamp (S. of 612)	PFO1E	16.8
	Long Hill Swamp (N. of 612)	PFO1E	1.5
	Long Hill Swamp (at Longhill Rd.)	PFO1E	0.5
	TOTAL		22.3

*PFO1A--Palustrine, Forested, Deciduous Broad-leaved, Temporary, Non-Tidal
PFO1C--Palustrine, Forested, Deciduous Broad-leaved, Seasonal, Non-Tidal
PFO1E--Palustrine, Forested, Deciduous Broad-leaved, Seasonally Saturated, Non-Tidal

Source: ESE, 1985.

Table 5-10

Selected Alignment (Revised Line A) Wetland Losses

Site #	Wetland Type	Acres on ROW	Stream	Watershed	Comments
1	PFO1A	0.45	Mill Creek	Mill Creek	alluvial flat adj. to stream, small portion is filled
3	PFO1A	1.47	unnamed trib.	Chisel Run	alluvial flat adj. to stream
5	PFO1A PFO1C	1.16 0.15	unnamed trib.	Chisel Run	alluvial terrace adj. to stream inundated alluvial terrace adj. to stream
8	PFO1A	0.60	unnamed trib.	Chisel Run	possibly old pond
9	PFO1C	4.32	unnamed trib.	Chisel Run	floodplain terrace
11	PFO1C	1.46	Chisel Run	Chisel Run	floodplain
12	PFO1A	0.89	unnamed trib.	Long Hill Swamp	alluvial terrace and seepage slopes adj. to stream
13	PFO1Hb	1.08	Long Hill Swamp	Long Hill Swamp	beaver impounded alluvial terrace
14	PSS1C	0.31	unnamed trib.	Long Hill Swamp	swampy, young woodland adj. to stream
19	PFO1A	0.28	unnamed trib.	Chisel Run	seepage slope above stream, perched on sandy clay loam
	Total=	**12.17**			
	PFO=	11.86			
	PSS=	0.31			
The following wetlands are located along a proposed interchange spur. They were delineated, but are not considered in the current project.					
15	PFO1A	0.34	unnamed trib.	Chisel Run	not currently involved, Monticello Ave. extension
17	PFO1A	0.50	unnamed trib.	Chisel Run	not currently involved, Monticello Ave. extension
	Total=	0.84			

(Source: WAPORA, Inc. August 1988)

wetland of Long Hill Swamp (22.3 acres). In comparison, Alignments A and A-2 result in a total direct loss of 10.6 acres, Alignment A-1 results in a total loss of 8.9 acres.

The extent of wetland loss by wetland type is given in Table 5-9 and 5-10. Functional values were derived for wetlands on each alignment using the FHWA method (Adamus, 1983). Results of this analysis are presented in Table 5-11.

Unquantified secondary physical and biological impacts may result depending on the method of wetland crossing utilized. Potential physical impacts include increased turbidity, sedimentation, chemical pollution, alteration of local water tables, changes in periodicity, and changes in water retention. Resulting impacts to biological communities may include a change in wetland size, plant species composition, class composition and productivity, a mortality to aquatic species, a barrier to faunal movement, and an effect on rare, threatened, and endangered species (Shuldiner, et al. 1979a, b).

Potential adverse impacts to the existing wetlands can be minimized by utilizing techniques such as soil erosion control measures along the edge of wetland systems and utilizing the single bottomless box culverts where feasible. Potential impacts from mudwaves may be eliminated by the removal of unsuitable material in wetlands prior to fill placement. Existing drainage patterns can be maintained by placing culverts at all crossings of tributaries to wetlands. This will minimize secondary impacts to wetlands resulting from hydrologic disturbance.

Crossing by pile supported roadway or by bridging is the method having the least physical and biological impact. This may be an alternative for the Route 612 interchange since a portion of the proposed interchange is located within the Chisel Run wetland floodplain.

Table 5-11
FUNCTIONAL VALUES FOR WETLANDS IN THE STUDY AREAS

Wetland Function	Powhatan Creek Tributary (1)	Mill Creek (2)	Long Hill Swamp (3)	Long Hill Swamp (4)	Long Hill Swamp (5)	Chisel Run (6)	Chisel Run (7)	Scott's Pond (8)	Model Emergent Wetland (Chisel Run)
Ground Water Recharge									
(Effectiveness)	L	L	L	L	L	L	L	L	L
(Opportunity)	L	L	L	L	L	L	L	L	L
Ground Water Discharge									
(Effectiveness)	L	L	L	L	L	L	L	L	L
(Opportunity)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flood Storage									
(Effectiveness)	H	M	H	H	H	H	H	H	H
(Opportunity)	M	M	H	M	M	M	M	M	M
Shoreline Anchoring									
(Effectiveness)	M	M	H	H	M	H	M	H	H
(Opportunity)	L	L	L	L	L	L	M	L	L
Sediment Trapping									
(Effectiveness)	M	L	H	H	M	H	H	M	H
(Opportunity)	M	M	M	M	L	M	M	M	M
Nutrient Retention/Removal									
Long Term Retention									
(Effectiveness)	M	M	H	H	M	H	H	M	H
(Opportunity)	-	H	-	M	M	M	M	-	-
Seasonal Retention									
(Effectiveness)	-	H	-	H	M	H	H	-	-
(Opportunity)	-	H	-	M	M	M	M	-	-
Food Chain Support									
Downstream Transport									
(Effectiveness)	M	L	M	M	M	M	M	L	M
In-basin Cycling									
(Effectiveness)	-	M	-	M	M	M	M	-	-
Fisheries Habitat (Warmwater)									
(Effectiveness)	M	L	M	M	L	M	L	L	M
General Wildlife Habitat									
(Effectiveness)	M	L	H	H	M	M	L	M	H
Recreation/Heritage									
(Effectiveness)	L	M	M	L	L	L	L	L	L

(1) Wetlands within Line D Corridor
(2) Wetlands within Line D and wetland #1 within Revised Line A Corridor (selected alignment)
(3) Wetlands within Line D Corridor
(4) Wetlands #13, #14 within Revised Line A Corridor (selected alignment)
(5) Wetland #12 within Revised Line A Corridor (selected alignment)
(6) Wetlands #3, #5, #9, #11 within Revised Line A Corridor (selected alignment)
(7) Wetland #8, #19 within Revised Line A Corridor (selected alignment)
(8) Wetland on Scott's Pond off of Revised Line A (selected alignment)
N/A Not applicable
Low (L), Moderate (M), and High (H) values were determined using the FHWA method (Adamus, 1983)

Rt.199:Tab 5-11
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While crossing of wetlands by pile supported roadway or bridging is the least disruptive, it is the most expensive. In March of 1987 a cost comparison of crossing wetlands by bridging versus crossing using culverts and mitigation measures was conducted. This comparison showed the cost of bridging to be approximately eleven times the cost of the culverts and creation of mitigation sites.

Some construction-related impacts may be rectified after the completion of the major construction phases. Possible mitigative measures include the regrading of areas to natural contours and the seeding, planting, and fertilization of disturbed areas. These activities would effectively restore areas peripheral to the right-of-way to pre-construction condition.

Based upon the above wetlands findings and considerations, it is determined that there is not praticable alternative to the proposed new construction in wetlands and that the proposed action includes all practicable measures to minimize harm to wetlands which may result from such use.

A replacement plan is necessary to mitigate these wetland losses. Wetlands will be replaced on a one to one, in kind basis. A 6 acre parcel along Mill Creek (site M-6A) has been identified as the primary mitigation site, and additional sites will be chosen to replace the remaining acreage. At site M-6A the creation of mitigation wetlands will be accomplished by the excavation of uplands and construction of berms and weirs adjacent to an existing forested wetland. A variety of hydrophytic native herbs, shrubs, and trees will be planted, and the hydrology will initially be closely monitored and controlled until the optimum hydrologic regime is established. It is expected that, in time, replacement wetlands will maintain themselves with minimal artificial manipulation and will effectively replace the acreage and functional values of the filled wetlands.

Several potential mitigation sites will be identified. Based on study and analysis of these sites, one or more sites will be selected for

wetlands mitigation. Several coordination meetings have already occurred regarding the M-6A mitigation site and other potential mitigation sites. An interagency coordination meeting was held on January 28, 1988 with a subsequent field review of site M-6A on February 12, 1988. The meeting notes and attendance roster from the January 28, 1988 meeting are included in Appendix B as is the subsequent mitigation report which followed recommendations made during the February 12, 1988 interagency field review. Final mitigation of the wetland impacts will continue to be coordinated with federal, state and local regulating and advisory agencies.

5.10.6 Floodplains

The floodplains associated with all of the creek systems located within the study area will be affected by the proposed alignments. All proposed alignments would result in the six stream crossings of Mill Creek, Chisel Run, Upper Long Hill Swamp Creek, Lower Long Hill Swamp Creek and two unnamed tributaries of Powhatan Creek.

Floodplain impacts would include decreases in natural and beneficial floodplain values such as the reduction of floodplain habitat and storage capacity. Indirect impacts would include slight changes in hydrologic regimes, with resultant changes in the extent and/or duration of flood events. Department compliance with EO 11988 is described in detail in the Water Resources and Ecology Technical Report.

All of the primary build alternatives require modification of streams and their associated floodplains. The physical modification of the floodplains will require the following amounts of fill to create the various highway crossings: Alignment A--70,000 cubic yards; Alignment A-1 and Revised Line A--70,000 cubic yards; Alignment A-2--70,000 cubic yards; and Alignment D--140,000 cubic yards (see Table 4-3). Once construction activities are completed at

this location and structures are in place, no interference with the flood retention capacity of this area is anticipated.

As identified in the Flood Insurance Rate Maps for the City of Williamsburg, James City and York Counties developed by the National Flood Insurance Program, most of the project area has the status of minimal flood hazard. Areas given the status of special flood hazard or moderate flood hazard are confined to stream floodplains. The regulatory floodways involved for each crossing are given detailed consideration in the Water Resources and Ecology Technical Report. For each involvement within a regulatory floodway coordination with the Federal Emergency Management Agency will be performed.

Agency compliance with Executive Order 11988, regarding floodplain management, will be required for the proposed roadway. A reduction of risk for flood-related loss to human life and property will be accomplished by following standards and criteria for the construction and design of culverts and bridges under the National Flood Insurance Program. Additionally, culverts and bridges will be designed such that the base flood elevation will not be increased by more than 1 foot.

5.11 VISUAL EFFECTS

The aesthetic and visual impacts of the proposed project relate primarily to how the roadway alignment will affect views from adjacent neighborhood communities. Principal visual impacts from the proposed roadway include both short-term (construction activity and traffic congestion) and long-term effects (the project's physical structure and associated traffic movements).

Alignment A, A-1, A-2 and Revised Line A--Alignment A lies adjacent to two communities and crosses through the edge of several others. At its southern end, where Alternatives A and D converge, the roadway comes within 100 feet of the northern end of Ferncliff Drive in the Canterbury Hills Subdivision, a subdivision comprised of approximately 50 single-family detached homes in the middle to upper price range. There would be a visual intrusion on the

homes situated at the end of Ferncliff Drive. However, the view from four of the houses located closest to the alignment would not be affected due to existing visual barriers (i.e., the land drops away and densely forested area exists between houses and alignment).

Farther northward, at its intersection with Route 615, Alignment A traverses the western edge of the Strawberry Plains Road area. Alignment A separates Indigo Terrace/Brookhaven Drive on the east from Indigo Dam Road on the west. Indigo Terrace/Brookhaven Drive is a middle-income community with a high percentage of mobile homes and deteriorating structures.

Mount Pleasant Baptist Church serves as a focal point of the Indigo Terrace/Brookhaven Drive community. Alignment A would create a physical barrier between the church and the community it serves. This physical barrier would disrupt the visual environment of the community.

The proximity of the Alignment A roadway and the off ramps planned near Longhill Road Apartments and British Woods Townhouses, could result in short-term visual impacts (e.g. disruption of traffic along Longhill Road, roadway construction activities).

Alignment A crosses the northernmost edge of the Mooretown Road community in the area between Route 60 and the Chesapeake and Ohio Railroad tracks. Two sections of the community would be severely disrupted by construction of Alignment A: 1) a group of homes fronting Route 60 and extending back to the railroad tracks; 2) a group of lower-income structures on the northern edge of Mooretown Road. The core of the Mooretown Road community, which extends southward from Williams Circle, would not be disrupted by construction of the roadway. The proximity of the facility to the neighborhood would be disruptive in terms of the visual environment of the community.

Alignment D--At Ironbound Road, Alignment D crosses between Mount Pleasant Baptist Church and Indigo Dam Road, retaining the church on the

same side of the roadway to the Indigo Terrace, reducing the divisive physical/visual impact of the roadway upon this community.

Alignment D parallels the periphery of both of the upper-income developments of Windsor Forest and Ford's Colony and is particularly close to Ford's Colony. The visual impacts would be intrusive to homes in Ford's Colony in particular. The alignment is sufficiently removed from Hempsted Avenue in the Windsor Forest community and shielded by heavy vegetation in summer months. One house at 116 John Potts in Ford's Colony appears to be 200 to 300 feet from the alignment. Although the land drops away and summer vegetation is dense behind this house, the roadway would be within clear sight of this home and any other homes to be constructed at the end of this court.

No Build Alternative--The visual impacts associated with the different build alternatives would not be realized, if Route 199 is not built.

5.12 COSTS

Anticipated costs associated with each build alternative are shown in Table 5-12. The cost of the roadway improvements which would be required to accommodate projected traffic demands if the No Build Alternative is chosen are difficult to calculate due to number of possible combinations. It has, however, been determined that any of the A alignments would require 35 percent less lane-miles to accomplish an acceptable level of service than the improvements required with the No Build Alternative. Alignment D would require 40 percent less lane-miles than the No Build Alternative. Therefore, it can be seen that the No Build Alternative may actually be the more expensive Alternative.

5.13 CONSTRUCTION IMPACTS

Although some of the impacts associated with construction activity result in long-term effects, many of the construction-related impacts are very temporary. Some fish and benthic macroninvertebrate communities recover to pre-project conditions in a short time period. However, depending on the

Table 5-12
Comparison of Build Alternative Costs (Dollars)

Alignment	Right-of-Way	Construction	Total
Revised Line A	3,573,000	23,427,000	27,000,000
A	3,784,000	23,149,000	26,933,000
A-1	4,153,500	24,380,000	28,533,500
A-2	3,513,000	23,297,000	26,810,000
D	3,139,000	25,148,000	28,287,000

Source: Harland Bartholomew & Associates, Inc., 1985 and Virginia Department of Transportation, November 1986.

community affected and the magnitude of impact, some populations may never recover to pre-project conditions of species diversity and abundance. The utilization of best management practices such as erosion control devices and scheduling of construction during dry seasons and after fish spawning, will further reduce construction-related impacts. Roadway construction activities that will result in long-term impacts, such as alteration of the substrate by filling, must be minimized with the utilization of mitigation techniques as described in Section 5.16.

Construction activities are likely to cause local traffic to be affected on a short-term basis. However, since Route 199 is a proposed new roadway, impacts to existing roadways and traffic patterns will be limited only to periods when interchange construction is underway.

5.13.1 Water Quality

Potential effects of the proposed Route 199 construction include turbidity and sedimentation at each of the stream/wetland crossings. Construction-related spills can be prevented by prohibiting the discharge of harmful wastes into or alongside floodplains, preventing placement of excavated material into floodplains, and restricting the frequent fording of streams and floodplains by equipment. Water quality impacts will further be minimized by strict adherence to the Virginia Erosion and Sediment Control Handbook. Impacts, avoidance, minimization and mitigation measures are addressed in detail in the Water Resources and Ecology Technical Report.

5.13.2 Noise

During construction there is the potential for noise impacts significantly greater than those which will result from the normal traffic operations of the proposed roadway. These impacts should be of short duration, however, occurring only when construction activities in the immediate vicinity of the noise-sensitive sites occur.

A method of controlling construction noise is to establish the maximum level of noise that construction operations can generate. In view of this, the Department has developed and FHWA has approved a specification which establishes construction noise limits. The contractor will be required to conform to this specification to reduce the impact of construction noise on the surrounding community. This specification is included as Appendix E.

5.13.3 Air

Construction procedures are governed by VDOT under the Road and Bridge specifications. The specifications which are standard for all contracts awarded by the Department require the builder to observe and comply with all applicable laws, ordinances, regulations, orders, or decrees. The specifications incorporate provisions for minimizing air quality impact during construction and have been reviewed by the State Air Pollution Control Board and were found to be in conformance with the State Implementation Plan.

Measures will be taken to reduce fugitive dust and other emissions generated during construction. Emissions from construction equipment will be controlled in accordance with emission standards prescribed under state and federal regulations. Materials resulting from clearing and grubbing, demolition or other operations, except materials to be retained, must be removed from the project, burned or otherwise disposed of by the contractor. Any burning, when permitted, will be conducted in accordance with applicable local laws and state and federal regulations.

5.14 UNAVOIDABLE ADVERSE IMPACTS

Although some of the potential adverse impacts can be reduced or prevented, certain impacts cannot be avoided during highway construction. Such impacts include:

- Indirect impacts to habitats due to changes in soil moisture, shading and other related parameters;
- Displacement or loss of wildlife habitat;
- Changes in aquatic biotic communities;
- Obstruction to and/or changes in movement patterns of aquatic and terrestrial fauna;
- Alteration of existing hydrologic regimes and floodplain dynamics; and
- Increased sedimentation and turbidity as well as other water quality changes.

To the extent possible and feasible these impacts will be minimized utilizing appropriate construction and design techniques and mitigation measures. Ecological impacts will be mitigated as detailed in the Water Resources and Ecology Technical Report.

5.15 SHORT-TERM USE OF ENVIRONMENT AND LONG-TERM PRODUCTIVITY

Although the short-term impacts associated with construction activity are likely to be reduced once the roadway is completed, some of the other more permanent impacts, such as wetland elimination and habitat loss, will occur on a long-term basis. Careful planning and proper use of known mitigation techniques should greatly reduce long-term impacts. The proposed roadway is expected to provide an overall net benefit in the area as to negate any of the remaining environmental consequences.

5.16 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS

In the immediate sense, the loss of mature forested uplands and wetlands cannot be avoided by the proposed roadway construction. Newly created mitigation areas are planned to replace the wetlands to be eliminated by the project. Elimination of forested areas will consequently eliminate existing habitats. The direct conversion of existing agricultural land will also be an irreversible consequence of the Route 199 corridor.

Regardless of the alignment selected, energy will be expended during the construction of Route 199. The Energy Analysis Technical Report details and compares the direct and indirect consumption of energy for each alignment alternative. Overall, less energy will be consumed by any of the build alternatives than by the No Build Alternative.

5.17 SUMMARY OF MITIGATION COMMITMENTS

To minimize the short-term wetland and/or floodplain impacts associated with construction activity at the various creek crossings and their associated wetland and/or floodplains, best management practices will be utilized during all phases of construction. These measures include, but are not limited to, the use of berms, dikes, dams, sediment basins, fiber mats, straw silt barriers, netting, mulch, and grasses. Work shall be scheduled during dry months, if practical, using erosion control methods and installation of bottomless culvert structures or countersinking of culverts. Wetland fringe areas and areas impacted by mud waves which become disturbed by the roadway construction are to be restored once construction activity has ceased by regrading followed by seeding, planting and fertilization. The remaining portion of wetland area which cannot be avoided and for which every effort has been made to minimize impacts will be compensated for by the artificial creation of in-kind replacement systems at a 1:1 ratio to those wetlands. Monitoring of mitigation sites will be conducted to ensure successful vegetation establishment of proper wetland function. Failure of these objectives will necessitate reestablishment of the selected site(s). Mitigation measures include elevating structures to avoid wetland impacts, narrowing of right-of-ways and line shifts wherever practical. Detailed mitigation measures are included in the Water Resources and Ecology Technical Report.

6.0 COMMENTS AND COORDINATION

6.1 GOVERNMENTAL AGENCY RESPONSES

In accordance with the U.S. Office of Management and Budget Circular A-95, comments concerning this project have been solicited from the following governmental agencies and individuals:

- o York County Administrator
- o James City County Administrator
- o James City County Director of Planning
- o York County Director of Planning*
- o Williamsburg City Manager
- o James City County Health Department
- o York County Superintendent of Schools*
- o James City County Superintendent of Schools*
- o Virginia Institute of Marine Science*
- o Virginia Marine Resources Commission*[o]
- o State Air Pollution Control Board*
- o State Water Control Board*
- o Council on the Environment
- o Office of Emergency and Energy Services
- o Department of Conservation and Historic Resources*
- o Peninsula Planning District Commission*
- o Metropolitan Planning Organization*
- o Virginia Department of Health*
- o Department of the Army, Corps of Engineers*[o]
- o U.S. Department of the Interior, Fish and Wildlife Service[o]
- o U.S. Department of Commerce, Office of the Deputy Assistant Secretary for Environmental Affairs
- o Department of Health and Human Services
- o U.S. Environmental Protection Agency*
- o U.S. Department of Housing and Urban Development*
- o U.S. Department of the Interior, Office of Environmental Project Review
- o Urban Mass Transportation Administration

The agencies which responded to the notice prior to the publication of the DEIS are indicated by an asterisk (*). Agencies designated as cooperating agencies are indicated by a zero (o). Out of the 13 agencies that responded, seven merely identified the appropriate contact person for future coordination. The following specific comments were received prior to publication of the Draft Environmental Impact Statement:

1. Comment: York County's Director of Planning requested a tentative schedule of events with respect to the on-going environmental study.

   Disposition: A schedule was subsequently supplied by VDOT.

2. Comment: The Virginia Institute of Marine Science pointed out that Alignment D appeared to cross the upper end of Powhatan Creek. They expressed a concern over the possible impacts that the proposed crossing may have on the wetlands in that area.

   Disposition: The potential impacts of Alignment D on the wetlands associated with Powhatan Creek have been carefully evaluated and documented in the Route 199 Water Quality and Ecology Technical Report. The results of this study are summarized in Sections 4.9 and 5.10.

3. Comment: The Virginia Marine Resources Commission stated that since their primary responsibility is to process permit applications, their ability to provide assistance in the review of technical data is very limited. They anticipate becoming involved when a General Permit application is submitted for proposed encroachment to state-owned subaqueous land; however, they encourage early agency coordination.

   Disposition: VDOT will continue to keep the Virginia Marine Resources Commission notified during the project's development. All appropriate permits will be acquired before construction commences.

4. Comment: The Virginia Department of Health stated that there are no public water supply reservoirs in the immediate vicinity of the subject project; however, there are public water supply reservoirs or watersheds for public water supplies within five to ten miles of the proposed

alignments. They requested that the draft EIS provide information on how the project will affect these adjacent watersheds or reservoirs.

Disposition: The potential impacts of the proposed alignments on adjacent watersheds and reservoirs have been evaluated and documented in the Route 199 Water Quality and Ecology Technical Report. The results of this analysis are summarized in Sections 4.9 and 5.10.

5. Comment: The U.S. Department of Housing and Urban Development stated that, in keeping with Departmental procedures, a copy of the draft EIS should be forwarded to the Philadelphia Regional Office.

   Disposition: A copy of the approved draft EIS will be forwarded to the Philadelphia Regional Office as requested.

6. Comment: The U.S. Environmental Protection Agency requested that they be notified of any anticipated disturbances in wetland areas or aquatic or terrestrial habitats so that a joint inspection of these sites could be arranged.

   Disposition: An Environmental Protection Agency representative participated in an inter-agency field review of the project corridor on August 23, 1985. This agency has been included in the list of agencies, organizations and persons to whom copies of the draft EIS and final EIS will be sent for review.

A Notice of Intent to Prepare an EIS was published in the Federal Register on March 18, 1985 to notify all agencies, organizations and individuals who may not have been included in the original VDOT list of interested and involved parties.

A pre-coordination meeting interagency field review was held on August 23, 1985. The following agencies were represented:

- U.S. Department of Interior, Fish and Wildlife Service
- U.S. Department of Commerce, National Marine Fisheries Service

- o U.S. Environmental Protection Agency
- o College of William and Mary

The purpose of the meeting was to familiarize the agencies with the project study area and to obtain their preliminary comments and observations. Topics which were highlighted included the functional values of the wetlands, the use of the area by anadromous fish species, and the proximity of Alignment A to the small-whorled pogonia (Isotria medeoloides) colony.

The Fish and Wildlife Service commented that since in-kind replacement of palustrine forested wetlands is impossible, mitigation of wetland loss would involve replacement with emergent wetland by functional value. They went on to say, and were supported by the Environmental Protection Agency, that unavoidable wetland crossings should retain at least: 1) a natural stream bottom, and 2) a natural stream meander. They stated that Section 7 procedures for endangered species involvement will be required if Alignment A is selected. The National Marine Fisheries Service commented that most streams in the study area are likely to be used by spawning alewives during peak spawning years.

Route 199 was discussed at the September 26, 1985 interagency coordination meeting. The following agencies were represented:

- o Virginia Water Control Board
- o Virginia Marine Resources Commission
- o Virginia Division of Parks and Recreation
- o Virginia Commission of Game and Inland Fisheries
- o Virginia Division of Soil and Water Conservation
- o U.S. Department of Interior, Fish and Wildlife Service
- o U.S. Department of Commerce, National Marine Fisheries Service
- o U.S. Environmental Protection Agency
- o U.S. Department of Army, Corps of Engineers

A preliminary determination of impacts and mitigation plans were presented for discussion and comment. The following specific comments were received:

1. Comment: The Marine Resources Commission prefers Alignment A-1 and concurs with the comments made by the National Marine Fisheries Service, Corps of Engineers and Commission of Game and Inland Fisheries.

   Disposition: None required.

2. Comment: The Commission of Game and Inland Fisheries requested adequate drainage under fill to minimize wetland impacts. Culverts should be lined up with streams and strict silt and erosion controls must be adhered to. In addition, they requested that proper coordination with the Fish Wildlife Service be implemented regarding endangered species involvement.

   Disposition: Best management practices, as described in the State's Hydrologic Modifications Handbook, will be utilized during the development of drainage and construction plans in order to minimize wetlands impacts. Environmental agencies will have the opportunity to review and comment on permit applications for dredge and fill activities. Erosion and siltation wil be minimized by strict adherence to the methods described in the Virginia Erosion and Sediment Control Handbook. VDOT will continue to coordinate informally with the Fish and Wildlife Service. If formal consultation is deemed necessary by that agency, it will be initiated at the appropriate time.

3. Comment: The Division of Soils and Water Conservation stated that strict silt and erosion controls should be applied in accordance with the Virginia Erosion and Sediment Control Handbook.

   Disposition: The Virginia Erosion and Sediment Control Handbook will be strictly ahdered to during clearing, grubbing and construction activities.

4. Comment: The Fish and Wildlife Service referenced their letter of July 9, 1985 to VDOT and stated that additional comments would be transmitted via letter as soon as possible. An October 9, 1985 letter from the USFWS provides comments and recommendations. In these letters, the Fish and Wildlife Service recommended the reintroduction of Alignment A-1 to avoid endangered species involvement while minimizing wetland stream crossings. The Service prefers that stream crossings be accomplished by construction of bridges, where feasible. Where not feasible, bottomless box culverts are preferred; otherwise the box should be countersunk to provide for low flow/aquatic organism passage and natural streambed development. Since the proposed interchange at Route 612 on Alignment A is expected to adversely impact a significant amount of bottomland hardwood swamp within the Chisel Run drainage, the draft EIS should discuss the need for this interchange as well as measures to avoid the wetland or to significantly minimize encroachment. They stressed that every effort to avoid and minimize impacts must be thoroughly investigated before replacement will be considered as mitigation by the Service.

Disposition: The department has developed Revised Line A in response to this request.

This alternative alignment will not impact the small-whorled pogonia (*Isotria medeoloides*). This alternative will be given appropriate consideration in addition to Alignments A, A-2 and D.

All measures to avoid, minimize, rectify and compensate impacts are detailed in the Water Resources and Ecology Technical Report.

5. Comment: The National Marine Fisheries Service favors Alignment A-1; however they would like to see alignment changes to minimize wetland impacts, a value assessment of the wetlands, and an opportunity to review the methodology. They prefer that floodplains be bridged on open piles. If culverts must be used, their design should accommodate anadromous fish. Wetland mitigation should be accomplished downstream of the impoundment in order to optimize estuarine values.

Disposition: The purpose of the review process is to select the best alignment. Your preference for A-1 will be considered.

The current set of proposed alignments minimize wetland encroachment to the greatest extent possible. All encroachment on Alignments A and A-1 are perpendicular crossings that limit impact to smallest acreage possible. Most wetlands encroachment on Alignment D are also perpendicular crossings which minimize wetland losses. Additionally, one of the proposed crossings will be bridged. The one parallel encroachment has been moved out of the floodplains wetland as far as possible.

Wetlands were assessed on a value basis using the Adamus method and detailed in the Water Resources and Ecology Technical Report.

Floodplain bridging using open-piles at all locations is not economically practical. Properly designed culverts will minimize any increase in velocity or scouring. Culverts on Long Hill Swamp Creek and Chisel Run can be designed to accommodate anadromous fish by providing for low flow conditions using sills, berms, countersinking and/or bottomless pipe arches.

Potential areas for mitigation are detailed in the Water Resources and Ecology Technical Report. Most of these areas are downstream of the Chisel Run impoundment.

6. Comment: The Environmental Protection Agency concurred with Fish and Wildlife Service comments.

   Disposition: None required.

7. Comment: The Army Corps of Engineers stated a preference for Alignment A-1 but they want to see significant reductions in adverse wetland impacts. They prefer that wetlands be spanned on open pile structures. All mud waves should be removed, and all wetland loss be mitigated on a one for one basis.

Disposition: Impact minimization to wetlands has been accomplished through design changes to the extent practical. Mitigation plans are detailed in the Water Resources and Ecology Technical Report. Open-pile structures or spanning all wetlands is not economically practical. Culverts can be designed to minimize impact and provide for low flow/aquatic organism passage and natural streamland development.

Written comments received on the DEIS are included in sections 6.1.1 - 6.1.3. These comments are included in their entirity and are separated according to Federal, state or local agencies.

6.1.1 Federal Agencies

Advisory
Council On
Historic
Preservation

The Old Post Office Building
1100 Pennsylvania Avenue, NW, #809
Washington, DC 20004

MAR 18 1986

Mr. James M. Tumlin
Division Administrator
Federal Highway Administration
400 North Eighth Street
P.O. Box 10045
Richmond, VA 23240

Dear Mr. Tumlin:

On February 3, 1986, the Council received the draft Environmental Imapct Statement/4(f) Statement and your request for comments on the Route 199 extension in James City and York Counties, Virginia. Since that time we have received a copy of the Phase I Archaeological Reconnaissance Survey report for the project.

We have reviewed these documents, which include correspondence with the Virginia State Historic Preservation Officer (SHPO). Because no final decision has been reached on the route of the extension, we have no substantive comments to make at this time. We concur, however, with the Virginia SHPO's comments and the recommendations in the Survey report, that once a preferred alternative is selected, Phase II investigations should proceed in order to determine which archaeological sites may be eligible for the National Register of Historic Places.

We appreciate your involving the Council at this stage in the planning process, and look forward to working with you on the final mitigation plans. If you have any questions about our comments, please call Tom McCulloch at 202-786-0505 (an FTS number).

Sincerely,

Don L. Klima
Chief, Eastern Division
of Project Review

HARLAND BARTHOLOMEW AND ASSOCIATES
RECEIVED
MAR 25 1986
RICHMOND, VA.

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MAR 20 1986
ENVIRONMENTAL
QUALITY DIV.

Disposition:

Revised Line A has been selected. Phase II Archaeological Investigations have been conducted and included in this report.

Federal Emergency Management Agency
Region III 105 South 7th Street Philadelphia, Pennsylvania 19106

February 18, 1986

RECEIVED
FEB 24 1986
ENVIRONMENTAL
QUALITY DIV.

R. L. Hundley
Environmental Engineer
Virginia Department of Highways & Transportation
1221 East Broad Street
Richmond, Virginia 23319

RE: Draft Environmental Impact Statement
Rt 199, James City & York Counties

Dear Mr. Hundley:

This is a response to your transmittal of January 29, 1986. In Section 5.10.6 of the subject Environmental Impact Statement, it states that "culverts and bridges will be designed such that the base flood elevation will not be increased by more than one (1) foot". For the most part, there is no increase allowed in the 100 year flood elevation. It appears that the above quoted statement misinterprets the objective of Executive Order 11988.

We recommend that your office contact one of our engineers to discuss this project and the requirements of Executive Order 11988 in more detail.

Sincerely,

James R. Asher
for

Walter P. Pierson
Chief,
Natural and Technological
Hazards Division

TTY FOR DEAF 215-597-0850

Disposition:

The project will be designed in compliance with E.O. 11988

Federal Emergency Management Agency
Region III 105 South 7th Street Philadelphia, Pennsylvania 19106

March 12, 1986

RECEIVED
MAR 17 1986
ENVIRONMENTAL
QUALITY DIV.

Mr. Vincent J. Valenti
Virginia Department of Highways & Transportation
1221 East Broad Street
Richmond, Virginia 23219

RE: Route 199
Project 0199-965-101-PE-100
James City & York Counties

Dear Mr. Valenti:

Thank you for the opportunity to comment on the referenced project. To that end we would like to request a copy of the Water Resources and Ecology Technical Report for review. We did note in the Draft EIS that the "action" complies with Executive Order 11988. By viewing the Technical Report we would like to determine if the Virginia Department of Highways & Transportation, the Federal Highway Administration and FEMA, Region III review process and criteria are compatable. We are particularly interested in the impact to the designated floodway when applicable.

Please forward the Technical Report to Thomas M. Majusiak, P.E. of my staff.

Sincerely,

James R. Archer
for
Walter P. Pierson
Chief,
Natural and Technological
Hazards Division

HARLAND BARTHOLOMEW AND ASSOCIATES
RECEIVED
MAR 19 1986
RICHMOND, VA.

HARLAND BARTHOLOMEW AND ASSOCIATES
RECEIVED
RICHMOND, VA.

TTY FOR DEAF 215-597-0850

Disposition:

The Technical Report was forwarded to Mr. Pierson.

Federal Emergency Management Agency

Region III 105 South 7th Street Philadelphia, Pennsylvania 19106

RECEIVED

APR 18 1986

ENVIRONMENTAL QUALITY DIV.

April 14, 1986

R. L. Hundley
Virginia Department of Highways & Transportation
1221 East Broad Street
Richmond, Virginia 23219

Re: Route 199
Project: 0199-965-101, PE-100
James City & York County, Va.

Dear Mr. Hundley:

We have reviewed the Final Technical Report "Water Resources and Ecology" for the referenced project. It had been noted in the EIS that the Technical Report would detail the findings in regard to Executive Order 11988.

Overall we have found very little discussion in the Technical Report concerning E.O. 11988 and no calculations concerning the impact on the 100-year elevation. As a minimum we would require the following information in order to make an adequate review.

1. Identification of all stream crossings in relation to status of NFIP mapping, ie., floodway, floodfringe, approximate study, no study.

2. Increase or decrease in 100-year profile or floodway profile.

3. Length of stream affected upstream of project.

4. Methodology used to calculate floodway impacts.

If you have any questions regarding our concerns, please contact Thomas M. Majusiak, P.E. in our office.

HARLAND BARTHOLOMEW AND ASSOCIATES
RECEIVED
APR 22 1986
RICHMOND, VA.

Sincerely,

Walter P. Pierson
Chief
Natural and Technological
Hazards Division

TTY FOR DEAF 215-597-0850

Disposition:

According to the Department's policy, culverts and/or bridges will be designed to accommodate the 100 year stream flow. Proper engineering methods will be employed by the Department to ensure that no upstream impacts will result to the floodway or floodfringe. Environmental agencies will have the opportunity to review and comment on permit applications for all dredge and fill activities.

United States Department of Agriculture
Soil Conservation Service
3127 Forge Road
Toano, Virginia 23168

RECEIVED
FEB 25 1986
ENVIRONMENTAL QUALITY DIV.

February 24, 1986

Route 199
Project: 0199-965-101, PE-100
James City and York Counties

Mr. R. L. Hundley
Environmental Engineer
Department of Highways & Transportation
1221 East Broad Street
Richmond, Virginia 23219

Dear Mr. Hundley:

The "Draft Environmental Impact Statement" for Route 199 has been reviewed.

1. Enclosed is a "Flood Hazard Analyses - Powhatan Creek and Tributaries" which may be of help in your decision making process.

2. We do not have any additional comments inasmuch as it appears areas of concern have been adequately addressed.

If you have any questions or need additional information, please contact me.

Sincerely yours,

Lester L. Seglin
District Conservationist

HARLAND BARTHOLOMEW AND ASSOCIATES
RECEIVED
FEB 26 1986
RICHMOND, VA.

The Soil Conservation Service is an agency of the Department of Agriculture

SCS-AS-1
10-79

Disposition:

No response required.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Habitat Conservation Branch
State Fish Pier
Gloucester, MA 01930-3097

March 20, 1986

Mr. R.L. Hundley
Environmental Engineer
Virginia Department of Highways
and Transportation
1221 East Broad Street
Richmond, Virginia 23219

Dear Mr. Hundley:

The National Marine Fisheries Service (NMFS) has reviewed the Draft Environmental Impact Statement (DEIS) and Water Resources and Ecology Technical Report (WRETR) for the proposed Route 199 project in James City and York Counties and provides the following comments.

General Comments

The NMFS maintains its position that bridges should be utilized in roadway construction to minimize adverse impacts to wetland habitats. The DEIS states that bridges would be cost-prohibitive, however, no data are provided to substantiate that bridges are not economically feasible alternatives. The document should include the estimated costs of bridge and single and multiple bottomless box culvert construction for each alternative alignment. The DEIS should also discuss all alternatives that minimize direct and indirect wetland impacts, allow passage of anadromous resources, maintain circulation, natural stream meandering, and detritral export, particularly during minimum flows.

The NMFS remains concerned that the proposed project will adversely impact anadromous fish species. Davis et al. (1970) confirmed Powhatan Creek as a spawning site of alewife (*Alosa pseudoharengus*) and blueback herring (*Alosa aestivalis*), although the upstream limit of spawning was uncertain. Based on the known life history and ecological requirements of these species, and considering the habitat found within the project site, it is our opinion that these locations are suitable spawning sites for the alosids previously mentioned, particularly the alewife. The WRETR noted that fish sampling was conducted in May and August to identify endemic juvenile and adult fish species in each of the creeks and associated shallow water habitats. Sampling conducted at these times likely missed alosid spawning, and therefore, the NMFS recommends that additional sampling be conducted in Powhatan Creek and its tributaries from mid-March through May to confirm whether these streams are utilized as alosid spawning sites. The sampling should be designed to document the presence of alosid eggs and larvae and the extent to which these streams are utilized as alosid spawning and nursery habitat.

The NMFS prefers an alignment that will eliminate or minimize adverse impacts to wetlands, and anadromous fish, while avoiding the small-whorled pogonia (Isotria medeoloides), an endangered species, located within the path of proposed alignment A. It appears alignment A-1 is a feasible alternative that would eliminate adverse impacts to the I. medeoloides population, while minimizing the impacts to palustrine wetland and bottomland hardwood habitats.

The DEIS should discuss in greater detail specific wetland impacts and proposed mitigation plans. Although the WRETR identifies impacts and mitigation plans in detail, additional information should be supplied in the DEIS rather than cross-referencing the WRETR document. The NMFS recognizes the need and mandate to limit the extent of discussion in the DEIS. However, key information such as site-specific direct wetland impacts and mitigation sites with detailed plans should not be omitted from the document. Results of the impact analyses (Adamus method) and descriptions of the specific mitigation plans and costs should be discussed fully and concisely in the DEIS.

Specific Comments

Section 4.9.4, pg. 4-50, par. 3. The second sentence should read: "Anadromous species having the greatest potential for utilizing these creeks are alewife (Alosa pseudoharengus) and blueback herring (Alosa aestivalis)." The NMFS recommends that the following sentences supplement this section: "Lower Powhatan Creek has been confirmed as an alosid spawning site (Davis et al. 1970), and spawning is known to occur at least as far upstream as mile 8.7 (Mudre et al. 1985). However, based on the known life histories of these species, and their habitat requirements, the entire project area represents potential habitat, especially for A. pseudoharengus."

Section 5.10.5, pg. 5-47, par. 1. The sixth sentence should read: "In comparison, Alignments A and A-2 result in a total direct loss of 10.6 acres, whereas Alignment A-1 results in a total loss of 8.9 acres."

Section 5.10.5, pg. 5-50, par. 2. The section identifies mitigation procedures for direct loss of palustrine emergent wetlands. The importance and direct loss of bottomland hardwood habitats should also be discussed and related to proposed mitigation measures. All unavoidable losses of irreplaceable bottomland hardwood habitats should be specifically identified.

Section 5.13, pg. 5-55, par. 1. The second sentence leads one to believe that impacts to ecological communities are typically minor and short in duration. The NMFS recommends that the statement be rephrased to eliminate misinterpretation. We suggest that the following sentences be substituted: "Some fish and benthic macroinvertebrate communities recover to pre-project

conditions in a short time period. However, depending on the community affected and the magnitude of impact, some populations may never recover to the pre-project conditions of species diversity and abundance."

Section 5.17, pg. 5-59, par. 1. The DEIS states that all wetland fringe areas disturbed by roadway construction shall be restored by regrading, seeding, planting, and fertilization, while direct wetland losses will be mitigated at a 1:1 ratio. The document should state that each restoration or mitigation site will be created with species endemic to the wetlands located within the project site. Any wetlands habitat impacted by construction related mudwaves should be noted in the document and included as areas to be fully restored. Monitoring of restoration and mitigation sites should be conducted to determine success or failure. The DEIS should further state that if such monitoring demonstrates that restoration and/or mitigation have proven unsatisfactory, then any unsuccessful site will be physically altered or replanted until the objectives of in-kind replacement have been achieved.

Should there be questions concerning our comments, please contact either James Turek or Ed Christoffers at (301) 226-5771.

Sincerely,

Thomas E. Bigford
Branch Chief

LITERATURE CITED

Davis, J., J.P. Miller, and W.L. Wilson. 1970. Biology and utilization of anadromous alosids. Completion Report, Anadromous Fish Project Virginia AFC-1.

Mudre, J.M., J.J. Ney, and R.J. Neves. 1985. Analysis of impediments to spawning migrations of anadromous fish in Virginia rivers: Phase II. Dept. of Fisheries and Wildlife Sciences, Virginia Polytechnic Institute and State University.

1. Section 4.9.4., p. 4-50, par 3

   The spelling was corrected for Alosa psudoharengus and Alosa aestivalis.

2. Section 5.10.5, p. 5-47, par 1

   The sixth sentence in this paragraph was corrected.

3. Section 5.10.5, p. 5-50, par 2

   Comments addressed in Section 5.10.5.

4. Section 5.13, p. 5-55, par 1

   The wording was changed as suggested.

5. Section 5.17, p. 5-59, par 1

   Comments addressed in Section 5.17.

General Comments

Disposition:

In response to this and similar agency comments, a detailed cost comparison of two methods of wetland crossing was prepared: 1) crossing wetlands using bridges versus 2) crossing wetlands on culverted fill. Costs of the latter method of crossing included the establishment and monitoring of a mitigation site.

The breakdown of mitigation costs was based on a generalized estimate to be used for comparative analyses only. The total cost of crossing wetlands on fill by bridging is approximately eleven times the cost of crossing of wetlands on fill with culverts.

U.S. Department of Housing and Urban Development
Philadelphia Regional Office, Region III
Liberty Square Building
105 South Seventh Street
Philadelphia, Pennsylvania 19106-3392

24 MAR 1986

Mr. Robert L. Hundley
Environmental Quality Engineer
Virginia Department of Highways
and Transportation
1401 East Broad Street, Room 114 Annex
Richmond, VA 23219

Dear Mr. Hundley:

We have completed our review of the Draft Environmental Impact Statement for Route 199 James City and York Counties. In general, we consider the document to have been well done, thorough and comprenhensive. We do feel, however, that it would be enhanced by the inclusion of a future land use map for this study corridor. Also, we recommend that certain of the maps, such as that of wetlands, should indicate the source of the information.

Thank you for the opportunity to comment. We would appreciate a copy of the Final statement when it is completed.

Sincerely,

Lawrence Levine
Regional Environmental Officer

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ENVIRONMENTAL
QUALITY DIV.

Disposition:

A Planned Land Use exhibit (Figure 4) is included in the Socioeconomic Technical Report which is available at the Virginia Department of Highways and Transportation. The source of information has been added to the exhibits in this report.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
DIVISION OF ECOLOGICAL SERVICES
1825B VIRGINIA STREET
ANNAPOLIS, MARYLAND 21401

February 14, 1986

RECEIVED
FEB 24 1986
ENVIRONMENTAL
QUALITY DIV.

Mr. R. L. Hundley
Environmental Engineer
Virginia Department of Highways
and Transportation
1221 East Broad Street
Richmond, VA 23219

Re: Draft environmental impact statement for Rt. 199, James City and York Counties, Virginia

Dear Mr. Hundley:

We have received a copy of the draft environmental impact statement for the referenced project. In order for us to make a thorough review of potential impacts upon fish and wildlife resources, please forward a copy of the "Water Resources and Ecology Technical Report" to the attention of Diane Eckles.

Thank you for providing us with the opportunity to comment on the draft statement. Our comments will be incorporated into the Department of the Interior's response on the environmental document.

Sincerely yours,

for Glenn Kinser
Supervisor
Annapolis Field Office

Disposition:

The Technical Report was sent as requested.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
DIVISION OF ECOLOGICAL SERVICES
1825B VIRGINIA STREET
ANNAPOLIS, MARYLAND 21401

March 18, 1986

Mr. R. L. Hundley
Environmental Engineer
Virginia Department of
Highways and Transportation
1221 East Broad Street
Richmond, Virginia 23219

RE: Route 199, James City and
York Counties -- Draft
Environmental Impact Statement

Dear Mr. Hundley:

This responds to your request of January 29, 1986, for Service comments on the referenced project. As a normal procedure, our comments are incorporated into one Department of the Interior letter and fowarded to the Federal Highway Administration. They will provide you with those comments.

Thank you for providing us with the opportunity to provide comments on the proposed project.

Sincerely yours,

R. P. Zepp Jr.
for Glenn Kinser
Supervisor
Annapolis Field Office

HARLAND BARTHOLOMEW AND ASSOCIATES
RECEIVED
MAR 25 1986
RICHMOND, VA.

RECEIVED
MAR 21 1986
ENVIRONMENTAL
QUALITY DIV.

Disposition:

No response required.

United States Department of the Interior

OFFICE OF THE SECRETARY
MID-ATLANTIC REGION
Custom House, Room 502
Second and Chestnut Streets
Philadelphia, Pennsylvania 19106

ER 86/159

March 21, 1986

RECEIVED
MAR 27 1986
ENVIRONMENTAL
QUALITY DIV.

James M. Tumlin
Division Administrator
Federal Highway Administration
P.O. Box 10045
Richmond, Virginia 23240

Dear Mr. Tumlin:

This is in response to the request for the Department of the Interior's comments on the draft environmental statement for SR-199 (SR-5 to I-64), James City and York Counties, Virginia.

PRELIMINARY SECTION 4(f) STATEMENT COMMENTS

The draft environmental statement acknowledges that construction, no matter which of the two build alternatives is selected, could have considerable impact on a number of significant prehistoric and historic archeological resources. Recommendations for a Phase II Significant Assessment Survey were made to the State Historic Preservation Officer (SHPO). (1)

With regard to the first proviso of Section 4(f), we would be willing to concur that there are no feasible and prudent alternatives to use of archeological resources; however, with regard to the second proviso of Section 4(f), we recommend the continued coordination and consultation with the SHPO for the protection and preservation of any identified archeological resources. Documentation of concurrence with the project planning for the cultural resources should be incorporated into the final document.

ENVIRONMENTAL STATEMENT COMMENTS

Mineral Resources

The affect of the proposed project on minerals was not addressed in the draft statement, but owing to the urban nature of the area to be affected, project impacts on mineral resources would probably be insignificant. For completeness, future versions of the document should include a statement regarding impacts on mineral resources as a result of project implementation. (2)

Fish and Wildlife Resources

With regard to project impacts upon fish and wildlife resources, the draft environmental statement is adequate, but there are several areas where further comment is appropriate.

Section 3.3, Build Alternatives - We commend the U.S. Department of Transportation and Virginia Department of Highways and Transportation for including the additional alternative, A-1, as recommended by the Fish and Wildlife Service. We support utilization of this alternative route to avoid impacts on the endangered small-whorled pogonia. (3)

Section 4.9.5, Wetlands - The hydroperiod modifiers should read, "seasonally-flooded, seasonally-saturated, and temporarily flooded." (4)

Section 5.5.3., Terrestrial Wildlife Habitat - We are pleased with the mitigation measures included in this section and hope that not only will future documents incorporate similar measures to mitigate impacts upon our dwindling terrestrial resources, but that such measures will be included in the final design plans. Additionally, we recommend that deer fencing, wildlife underpasses, and minimal clearing of existing vegetation within the right-of-way be included in the final design plans. (5)

Section 5.5.4, Threatened/Endangered Species - We recommend adding the following sentences to the end of this section:

> "In response to Fish and Wildlife Service recommendations, Alignment A-1, which would avoid adverse impacts on I. medeoloides, has been reintroduced. For further discussion of this issue see Section 6, comments and coordination, page 6-6." (6)

Section 5.10.5, Wetlands - Table 5-9 should be revised for Alignments A/A-1 and A/A-2 at the Chisel Run wetland located west of the state hospital. Both of these sites impact 1.3 acres of PFO1C not PFO1A wetland.

The environmental document and the "Water Resources and Ecology Technical Report" are vague on the total amount of wetlands to be impacted at Chisel Run by Alignments A, A/A-1, and A/A-2 in the vicinity of Long Hill Road. It is not clear how much acreage will be impacted at Chisel Run by the proposed interchange and roadway crossing. It would be helpful to show the station numbers, referenced in Table 4.2 of the technical report, on Figure 4-11 of the draft statement. (7)

In accordance with the Department's mitigation policy, the wetland habitats to be crossed by Alignments A, A/A-1, and A/A-2 are categorized as Resource Category 2. Due to the type and amount of wetlands involved in Alignment D, we object to its selection. It is the Department's position

that replacement of Resource Category 2 habitat values be in-kind, wherever possible. Unfortunately, forested wetlands cannot be replaced immediately, but instead must begin at an earlier successional stage. Therefore, in order to compensate for forested wetland losses, we recommend that a scrub/shrub dominated wetlands on a greater than 1:1 acreage basis be developed. By creating a scrub/shrub dominated wetland, eventual succession to a forested wetland will occur. By increasing the acreage involved, the time need for establishment of a forested wetland and its associated values is somewhat compensated. Therefore, it is our recommendation that the compensation plan be revised to include a dominance of shrubs in lieu of emergent plants and that the wetland creation site be increased in size so that a minimum of a 2:1 acreage ratio be achieved. Although we are cognizant of the Federal Highway Administration's policy regarding wetland replacement, we are not aware of any similar policy preventing the Virginia Department of Highways and Transportation from providing greater than 1:1 replacement.

As previously requested at the September 26, 1985 highway coordination meeting and by letter dated October 9, 1985, any wetland compensation plan should be coordinated with the Fish and Wildlife Service before inclusion in the draft environmental document. This coordination has not occurred and as a result, the proposed wetland replacement plan is not acceptable. It is suggested that, before the mitigation proposal is included in the final environmental impact statement, the Federal Highway Administration contact the Fish and Wildlife Service to resolve this issue.

FISH AND WILDLIFE COORDINATION ACT COMMENTS

The Fish and Wildlife Service (FWS) comments on a Department of the Army permit application for the project as presently proposed would be to recommend (1) selection of alignment A/A-1; (2) further reduction of wetland encroachments, particularly in the vicinity of Long Hill Road, where bridging of the wetlands is recommended; (3) incorporation of culverts within the wetland; (4) all crossings that have been identified as potential mud wave areas be demucked; (5) inclusion of bottomless culverts, where feasible; (6) where bottomless culverts are not feasible due to substrate, then the culverts should be countersunk 12" to facilitate low flow conditions and passage of aquatic organisms; (7) all unavoidable wetland losses be replaced in-kind; and, (8) incorporation of the FWS sediment and erosion control measures. Should the wetland compensation plan as presented in the draft environmental document be included in an application for a Corps permit, the FWS will recommend denial of the permit. (8)

SUMMARY COMMENTS

The Department of the Interior favors the selection of Alignment A/A-1 which would have the least impact on environmental resources. Provided

the measures mentioned above are included and documented in the final statement, the Department would offer no objection to Section 4(f) approval.

Sincerely,

Anita J. Miller
Regional Environmental Officer

cc:
Robert L. Hundley
Environmental Quality Engineer
Virginia Department of Highways
and Transportation
1401 East Broad Street
Room 114 Annex
Richmond, Virginia 23219

H. Bryan Mitchell, Director
Division of Historic Landmarks
Department of Conservation and
Historic Resources
221 Governor Street
Richmond, Virginia 23219

1. Preliminary Section 4(4) Statement Concerns

A Phase II archaeological study has been conducted and included in this report.

2. Mineral Resources

A discussion of Mineral Resources has been included in sections 4.9.2 and 5.10.2.

3. Section 3.3, Build Alternatives

No response required.

4. Section 4.9.5, Wetlands

The wording was changed as suggested.

5. Section 5.5.3, Terrestrial Wildlife Habitat

Mitigation measures including right-of-way fencing and minimal clearing within the right-of-way have been incorporated in the document. Wildlife underpassess are not incorporated as a part of this project due to the lack of large migratory species in the project area.

6. Section 5.5.4, Threatened/Endangered Species

An additional paragraph was included in this section as follows: "In response to the Fish and Wildlife Service recommendations, Alignment A-1, which would avoid adverse impacts on Isotria medeoloides, has been reintroduced." Subsequent to the public hearing, a further refinement of Alignment A, Revised Line A, was introduced to minimize the impact on Isotria medeolides and reduce project costs. A discussion of this alignment is fould in the summary of this report (Section 5.5.4).

7. Section 5.10.5, Wetlands

The wetland designation at Chisel Run has been changed to PFOIC. Regarding the extent of wetland impact at Long Hill Road reference Appendix F in the FEIS. The M-6A mitigation plan is included in Appendix B of this document.

In response to agency comments about mitigation, the wetland compensation plan will be based on a 1 to 1 in kind replacement of wetland resources. The M-6A mitigation plan is included in Appendix B of this document.

In response to comments regarding the wetland replacement ratio, it is currently Departmental policy to mitigate wetland losses on a 1 to 1 ratio.

8. Fish and Wildlife Coordination Act Comments

Coordination with the Fish and Wildlife Service has continued throughout the project. Appendix B documents this coordination and provides a mitigation plan for Site M-6A which was requested during an interagency field review.

P.H. File

United States Department of the Interior

FISH AND WILDLIFE SERVICE
DIVISION OF ECOLOGICAL SERVICES
1825B VIRGINIA STREET
ANNAPOLIS, MARYLAND 21401

March 28, 1986

MAR 31
SUFFOLK DISTRICT

Mr. S. A. Nash, Jr.
District Engineer
Department of Highways and Transportation
P.O. Box 1070
Suffolk, Virginia 23434

Dear Mr. Nash:

This letter is written in response to your call for comments on the alternative proposals for Route 199 in James City County and York County, Virginia. We request that it be made a part of your record for the April 3 public hearing.

As you know, the Fish and Wildlife Service has recommended a modification of Alternative A, known as A-1, to eliminate impacts on the small-whorled pogonia, a Federal and state listed endangered plant occurring adjacent to the Alternative A right-of-way. Transplantation of the pogonia is not a desirable alternative, because, to date, transplantation of this species has not been successful.

We were pleased to see that the recent draft EIS for the project included a description of Alternative A-1 and an explanation of the need for it. In our review of the EIS, we commended both your department and the Federal Highways Administration for giving this alternative full consideration. It was our understanding that this alternative was being given very careful consideration and was rather likely to be selected. For this reason, no formal Endangered Species Act consultation has been conducted with Federal Highways on Alternative A.

However, should the original Alternative A be selected, highway construction would definitely impact the pogonia and therefore the Endangered Species Act would require the responsible Federal agency to enter formal consultation with us concerning these impacts, before any irretrievable commitments of resources to this project were made.

In conclusion, we continue to support Alternative A-1 to avoid impacts on the endangered small-whorled pogonia.

Sincerely,

Glenn Kinser
Supervisor
Annapolis Field Office

Disposition:

A revised Line A has been selected. The impact to the pogonia (Isotria Medeoloides) is discussed in the Section 7 which is included as an appendix to this report and summarized in the Summary Section.

U.S. Department
of Transportation
**Urban Mass
Transportation
Administration**

REGION III
Pennsylvania, D.C.
Delaware, Maryland,
West Virginia, Virginia

434 Walnut Street
Suite 1010
Philadelphia, Pennsylvania 19106

February 5, 1986

Mr. R. L. Hundley
Environmental Engineer
Virginia Department of Highways
and Transportation
1221 East Broad Street
Richmond, Virginia 23215

RE: Route 199
Draft EIS/4(f) Statement

Dear Mr. Hundley:

Thank you for your January 29, 1986 letter requesting our comments on the draft Environmental Impact/4(f) Statement.

There appears to be no impact on mass transit as a result of this project and since no UMTA funds will be used in the development of this project, we have no comments to offer.

We appreciate your thinking of mass transit and please let us know if we can be of any assistance to you in the future.

Sincerely,

Devendra M. Soni
Director, Office of Management and
Technical Assistance

RECEIVED
FEB 10 1986
ENVIRONMENTAL
QUALITY DIV.

Disposition:

No response required.

Memorandum

U.S. Department of Transportation
Office of the Secretary of Transportation

Subject: Draft Environmental Impact Statement (DEIS)
Route 199 - James City and York Counties
FHWA-VA-EIS-86-01-D

Date: FEB 11 1986

From: Joseph Canny
Director, Office of Transportation Regulatory Affairs

Reply to Attn of:

To: Eugene W. Cleckley
Chief, Environmental Operations Division, HEV-11

We have reviewed the subject DEIS and recommend that a phase II Archaeological Study for the purpose of identifying and evaluating potential resources precede the selection of a preferred build alternative and issuance of the Final EIS.

We appreciate the opportunity to comment on the DEIS and look forward to receiving the final EIS.

Disposition:

A Phase II Archaeoligical Study has been conducted and incorporated in Section 5 of this report.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
841 Chestnut Building
Philadelphia, Pennsylvania 19107

MAR 21 '86

Mr. Robert L. Hundley
Environmental Quality Engineer
Virginia Department of Highways
& Transportation
1401 East Broad Street
Room 114 Annex
Richmond, Virginia 23219

Re: Draft Environmental Impact Statement (DEIS);
Route 199, Route 5 in James City County to Interstate 64
in York County (D.FHW.D40216.VA)

Dear Mr. Hundley:

This letter will serve as a confirmation of our conversation of 21 March 1986 regarding the request for extension for the filing of EPA Region III comments to the referenced project. The original filing date of 24 March, 1986 has been extended to 4 April 1986. We do not anticipate further delays in our comment letter.

Thank you for your cooperation. Please contact Mr. Jeffrey Alper (215/597-7828) for project specific issues.

Sincerely,

Richard V. Pepino

Richard V. Pepino, Chief
NEPA Compliance Section

RECEIVED
MAR 27 1986
ENVIRONMENTAL
QUALITY DIV.

Disposition:

No response required.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
841 Chestnut Building
Philadelphia, Pennsylvania 19107

HARLAND BARTHOLOMEW AND ASSOCIATES
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APR 17 1986
RICHMOND, VA.

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APR 14 1986
ENVIRONMENTAL
QUALITY DIV.

APR 4 '86

Robert Hundley
Virginia Department of Highways
& Transportation
1401 E. Broad Street
Room 114 Annex
Richmond, VA 23219

Re: Route 199
DFHW D40216-VA

Dear Mr. Hundley:

In accordance with the authority delegated to EPA under Section 309 of the Clean Air Act and the National Environmental Policy Act (NEPA), EPA has reviewed the DEIS for the above referenced project. We are concerned over the issues noted below, which should be clarified in the FEIS. Consequently, we have assigned the project an EC-2 rating on EPA's reference scale, a copy of which is attached for your reference.

The following suggestions are offered for your consideration. We feel that their inclusion in the FEIS would enhance the clarity and quality of the final document.

GROUND WATER

Although the DEIS touches upon ground water issues in Sections 4.9.2 and 5.10.2, EPA is concerned over the lack of details presented with regard to the impact that the project could have on the aquifers in the area. The document notes that the Cretaceous is the most productive of the four aquifers present, yet does not define the hydrogeologic or production capabilities of this or the other three systems. The FEIS should consider this shortcoming and thoroughly describe the physical locations, depths, withdrawal capacity and susceptibility of each of these aquifers to disturbances created by the project. In addition, the role that these factors might play in the future development of the area should be explored, since it is inevitable that it will occur.

Regarding drinking water, the FEIS should also include information on the location and production of wells that could be affected by the construction and operation of each of the alignments. Section 5.10.2 mentions that any well discovered during construction will be sealed to prevent future pollution. While we appreciate this plan, EPA is concerned with the overall quality of ground water and feels that the discussion should be expanded to encompass more than just the disturbance to existing wells. The broader implications of contamination of the aquifers, regardless of the presence of wells should be considered in the FEIS, with measures planned to mitigate for any damages.

NOISE

The FEIS should include a stipulation which would limit maintenance of construction equipment to the same hours that heavy equipment is permitted to be in use. In addition to the requirements that only factory recommended exhaust mufflers be used, there should be a requirement that those mufflers be in proper working order.

Based on the information presented, EPA wishes to reiterate its preference for Alignment A-1, as it appears to cause the least environmental disturbance. We thank you for including EPA in the early coordination process and appreciate your consideration of our input. We look forward to working with you in the future, especially in the area of wetland mitigation, as final design plans develop. Feel free to contact Jeffrey Alper of my staff at (215) 597-7817 if you have any questions.

Sincerely,

Richard V. Pepino

Richard V. Pepino
Chief, NEPA Compliance Section

Attachments

Disposition:

1. Comments have been noted and appropriate revisions made to the document in sections 4.9.2 and 5.10.2.

2. Section 5.13.2. Noise. The third paragraph in this section was changed to read: " A method of controlling construction noise is to establish the maximum level of noise that construction operations can generate. In view of this, the Department has developed and FHWA has approved, a specification which establishes construction noise limits. The contractor will be required to conform to this specification to reduce the impact of construction noise on the surrounding community. This specification is included as Appendix E."

S. MASON CARBAUGH
COMMISSIONER

RAYMOND D. VAUGHAN
DEPUTY COMMISSIONER

COMMONWEALTH of VIRGINIA

DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES
P. O. Box 1163, Richmond, Virginia 23209

February 5, 1986

Mr. R. L. Hundley
Environmental Engineer
Virginia Department of Highways
and Transportation
1221 East Broad Street
Richmond, Virginia 23219

Dear Mr. Hundley:

My staff has reviewed the Draft Environmental Impact Statement relating to Route 199 in James City and York Counties. The needs for the project tend to outweigh the loss of 20+ acres of farmland.

I appreciate the opportunity to review this project from an agricultural standpoint.

Sincerely,

S. Mason Carbaugh
Commissioner

bmc

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FEB 7 1986
ENVIRONMENTAL
QUALITY DIV.

Disposition:

No response required.

ELIZABETH H. HASKELL, CHAIRMAN
MARTINSVILLE

CARL C. REDINGER, VICE CHAIRMAN
ALEXANDRIA

EDGAR B. BOYNTON
RICHMOND

TIMOTHY E. BARROW
VIRGINIA BEACH

WALLACE E. REED
CHARLOTTESVILLE

COMMONWEALTH of VIRGINIA

State Air Pollution Control Board

Post Office Box 10089
RICHMOND, VIRGINIA 23240
TELEPHONE: (804) 786-2378

W. R. MEYER
EXECUTIVE DIRECTOR

February 7, 1986

RECEIVED
FEB 11 1986
ENVIRONMENTAL
QUALITY DIV.

Mr. R. L. Hundley
Environmental Engineer
Virginia Department of Highways
and Transportation
1221 East Broad Street
Richmond, Virgingia 23219

Dear Mr. Hundley:

Please reference your January 29, 1986 letter concerning the proposed Route 199-James City and York County Project 0199-965-101-PE-100.

The Board's concern, temporary effects due to construction (fugitive dust and open burning of landclearing debris), are adequately addressed since they are to be performed in accordance with the VDH&T Road and Bridge Specifications as stated on page 5-57, 5.13.1.

The dispersion modeling data for CO concentrations shown in Table 5-2, Page 5-26, predicts levels well below the National Ambient Air Quality Standards. The project, as proposed, will conform to the Virignia State Implementation Plan (SIP).

Sincerely,

W. W. Parks
Acting Assistant Executive Director
Air Quality Programs

WWP/KMM:evb

"An Equal Opportunity Employer"

Disposition:

No response required.

COMMONWEALTH of VIRGINIA

KENNETH A. ROWE
Director

Department of Aviation
4508 South Laburnum Avenue

P.O. BOX 7716
RICHMOND, VIRGINIA 23231
804 786 1164

RECEIVED
FEB 21 1986
ENVIRONMENTAL
QUALITY DIV.

February 20, 1986

Mr. R. L. Hundley
Environmental Engineer
Virginia Department of Highways
and Transportation
1221 East Broad Street
Richmond, Virginia 23219

Re: Route 199, James City and York Counties, 0199-047-102,103

Dear Mr. Hundley:

We have reviewed the above referenced Draft Environmental Impact Statement and have the following comments:

1. The operational activity at Williamsburg-Jamestown Airport would not appear to be directly affected by the proposed project.

2. The proposed project would provide better access to the Williamsburg-Jamestown Airport for those approaching from the West on I-64.

I hope these comments will be helpful to you and should you have any further comments, please feel free to call upon me.

Sincerely,

Ted I. Alman

Ted I. Alman
Airport Engineer
Airport Services Division

TIA/map

Disposition:

No response required.

RECEIVED
MAR 31 1986
OFFICE

COMMONWEALTH of VIRGINIA

COLONIAL SOIL AND WATER CONSERVATION DISTRICT
3127 Forge Road - Toano, Virginia 23168

March 27, 1986

Mr. F. N. Hall
Virginia Department of Highways
and Transportation
Post Office Box HD
Williamsburg, Virginia 23187

RE: Proposed Route 199 - York County
Between I-64 Lightfoot Interchange
and Route 60

Dear Mr. Hall:

On March 13, 1986, the Directors of this District voted unanimously to strongly oppose selection of Route D. This route poses environmental hazards in that it crosses streams, springs, ravines and steep land in the Waller Mill Reservoir watershed and is the closest of the three alternatives to this public water source.

Alternative A, which crosses high, level ground, much of which drains away from Waller Mill is our preferred route.

Alternative A-2, which is also high and level and further from the reservoir than D would be much preferable to D.

It should be noted that both the York County Board of Supervisors and the Williamsburg City Council (for this section of 199) also oppose Line D.

Sincerely yours,

Ryland C. Hazelwood Jr.

Ryland C. Hazelwood
Secretary

Disposition:

A revised Line A has been selected.

COMMONWEALTH of VIRGINIA

Commission for the Arts

JAMES MONROE BUILDING
101 N. 14th ST.—17th FLOOR
RICHMOND, VIRGINIA 23219
TELEPHONE (804) 225-3132

PEGGY J. BAGGETT
EXECUTIVE DIRECTOR

COMMISSION MEMBERS

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MRS. MARGARETTE M. SMITH
WINCHESTER, VIRGINIA

MRS. TRACY SPERO
NORFOLK, VIRGINIA

February 3, 1986

Mr. R. L. Hundley
Environmental Engineer
Department of Highways and Transportation
1221 East Broad Street
Richmond, VA 23219

Dear Mr. Hundley:

Thank you for the opportunity to review the draft environmental impact statement of James City and York Counties.

I have no comments.

Sincerely,

Peggy J. Baggett

Peggy J. Baggett
Executive Director

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FEB 6 1986
ENVIRONMENTAL
QUALITY DIV.

FEB 1986
RICHMOND, VA.

Disposition:

No response required.

Divisions
Forestry
Historic Landmarks
Litter Control
Parks and Recreation
Soil and Water Conservation

COMMONWEALTH of VIRGINIA

Department of Conservation and Historic Resources

Division of Historic Landmarks
H. Bryan Mitchell, Director

Research Center for Archaeology
Route 238, P.O. Box 368
Yorktown, Virginia 23690
Telephone (804) 253-4836

RECEIVED
FEB 24 1986
ENVIRONMENTAL
QUALITY DIV.

February 20, 1986

R. L. Hundley
Environmental Engineer
Dept. of Highways & Transportation
1221 East Broad Street
Richmond, Virginia 23219

RE: 0199-965-101, PE-100
James City & York Counties

Dear Mr. Hundley,

Thank you for providing this office with a copy of the draft environmental impact statement for the above project.

The sections of the EIS on cultural resources adequately addresses our agencys concerns regarding the need for Phase II significance evaluations for archaeological sites, and that there will be no impact to significant architectural resources.

Should you have any questions on the above comments please do not hesitate to contact this office.

Sincerely,

Bruce Larson
Review & Compliance Coordinator

cc: Calder Loth

Disposition:

Also see letters of November 19, 1985 and August 1, 1985 in appendix C of this document.

B. C. LEYNES, JR.
Director

DIVISIONS
FORESTRY
HISTORIC LANDMARKS
LITTER CONTROL
PARKS AND RECREATION
SOIL AND WATER CONSERVATION

COMMONWEALTH of VIRGINIA

DEPARTMENT OF CONSERVATION AND HISTORIC RESOURCES
DIVISION OF FORESTRY
509 E. Nine Mile Road
P. O. Box 635, Sandston, Virginia 23150
(804) 737-4791
Gene W. Augsburger, Regional Forester

March 20, 1986

FOREST INFLUENCES
Environmental Impact Statement
Route 199 Project #0199-965-101,PE-100
James City/York Counties

RECEIVED
- MAR 24 1986
ENVIRONMENTAL
QUALITY DIV.

Mr. R. L. Hundley
Environmental Engineer
Department of Highways & Transportation
1221 East Broad Street
Richmond, Virginia 23219

Dear Mr. Hundley:

As per your request, I have reviewed the Draft Environmental Impact Statement for Route 199, Project #0199-965-101,PE-100 and made an on site review.

My reaction is to recommend line "A" and A-1 around the endangered species (begonias). It is my opinion that line D encompasses too much marsh which serves as the headwaters for Powhatan Creek. Such a disturbance in this area is apt to produce a great sedimentation problem which can easily reach the James River. Also, mitigating efforts to construct emergent wetlands to replace forested wetlands is apt to disturb the area more. Replacement of these sensitive areas are nearly impossible and constructing wetlands could potentially do more harm than good.

On line A, A-1, I would recommend Best Management Practices such as crossing streams and wetlands at right angles and on pilings to maintain the integrity of the area, leave filter strips alongside streams and

revegetate denuded areas as fast as possible. The Division of Forestry can assist in establishing stands of trees at larger areas such as interchanges or open fields if necessary.

Thank you for giving us this opportunity to comment on the proposed Rt. 199 project.

Sincerely,

Dennis Gaston
Area Forester

mr
c: Phil Grim

Disposition:

A revised Line A has been selected which minimizes the wetland impacted. Mitigation measures for wetlands are discussed in Section 5.10.5.

B. C. LEYNES, JR.
Director

DIVISIONS
FORESTRY
HISTORIC LANDMARKS
LITTER CONTROL
PARKS AND RECREATION
SOIL AND WATER CONSERVATION

COMMONWEALTH of VIRGINIA

DEPARTMENT OF CONSERVATION AND HISTORIC RESOURCES
1100 Washington Building, Capitol Square
Richmond, Virginia 23219 (804) 786-2121

RECEIVED
MAR 31 1986
ENVIRONMENTAL
QUALITY DIV.

March 27, 1986

MEMORANDUM

TO: Mr. R. L. Hundley, Environmental Engineer
Virginia Department of Highways and Transportation

FROM: Bonnie S. Greenwood, Administrative Staff Specialist BG

SUBJECT: Draft Environmental Impact/Section 4(f) Statement on Route 199; Project 0199-965-101, PE-100; James City and York Counties

This project was reviewed by our department, and comments are as follows:

We recommend line "A" and A-1 around the endangered species (begonias). It is our opinion that line D encompasses too much marsh which serves as the headwaters for Powhatan Creek. Such a disturbance in this area is apt to produce a great sedimentation problem which can easily reach the James River. Also, mitigating efforts to construct emergent wetlands to replace forested wetlands is apt to disturb the area more. Replacement of these sensitive areas are nearly impossible and constructing wetlands could potentially do more harm than good. On line A, A-1, we recommend Best Management Practices such as crossing streams and wetlands at right angles and on pilings to maintain the integrity of the area, leave filter strips alongside streams and revegetate denuded areas as fast as possible. Our Division of Forestry can assist in establishing stands of trees at larger areas such as interchanges or open fields if necessary.

When we receive our Division of Historic Landmarks' VA Research Center for Archaeology's comments, we will forward them to you.

If you need any further information, please let us know.

ptc
cc: Phil Grimm, Forestry
Bruce Larson, HL-VRCA
Scott Crafton, S&WC

Disposition:

A Revised Line A has been selected which minimizes the wetlands impacted. Mitigation measures for wetlands are discussed in Section 5.10.5.

COMMONWEALTH of VIRGINIA

Department of Economic Development
1000 Washington Building
Richmond, Virginia 23219
(804) 786-3791

February 7, 1986

Mr. R. L. Hundley
Environmental Engineer
Department of Highways and Transportation
1221 East Broad Street
Richmond, Virginia 23219

Reference: Route 199
Project: 0199-965-101,PE-100
James City and York Counties
Environmental Impact/
Section 4(f) Statement

Dear Mr. Hundley:

The above referenced Draft Environmental Impact/Section 4(f) Statement has been reviewed in this Department.

In as much as the proposed project would have no effect on major industrial development activities and there being no manufacturing facilities within the primary area of concern, the Department of Economic Development will make no comments on this transportation facility.

Sincerely,

Scott Eubanks
Director

/jam

HARLAND BARTHOLOMEW AND ASSOCIATES
RECEIVED
FEB 1986
RICHMOND, VA.

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FEB 14 1986
ENVIRONMENTAL
QUALITY DIV.

Disposition:

No response required.

COMMONWEALTH of VIRGINIA

JAMES B. KENLEY, M.D.
COMMISSIONER

Department of Health
Richmond, Virginia 23219

March 27, 1986

SUBJECT: JAMES CITY and YORK COUNTIES
Route 199
Project 0199-965-101, PE-101

Mr. R. L. Hundley
Environmental Engineer
Virginia Department of Highways and Transportation
1221 East Broad Street
Richmond, Virginia 23219

Dear Mr. Hundley:

This Department has reviewed the Draft Supplement to the Final Environmental Impact Statement for the subject project. This is to advise you that Alternative No. 1 (A1) crosses part of the watershed for Waller Mill Reservoir. Since Waller Mill Reservoir is a raw water source for the City of Williamsburg's water system, consideration should be made to eliminate this alternative or special care be taken during construction to prevent erosion and runoff to the reservoir.

By copy of this letter, we are advising the other state and federal permitting agencies of our comment on this project.

Sincerely,

Eric H. Bartsch

Eric H. Bartsch, P. E., Director
Division of Water Programs

EHB/ecr
cc: SWCB - Tidewater
James City County Department of Utilities
York County Department of Utilities

RECEIVED
MAR 31 1986
ENVIRONMENTAL
QUALITY DIV.

Disposition:

As discussed in the document in Section 5.13.1 appropriate erosion and sedimentation controls will be employed to minimize erosion and runoff during the construction period.

COMMONWEALTH of VIRGINIA

JOSEPH J. BEVILACQUA, Ph. D.
COMMISSIONER

Department of
Mental Health and Mental Retardation

MAILING ADDRESS
P.O. BOX 1797
RICHMOND, VA. 23214

February 25, 1986

R.L. Hundley
Environmental Engineer
Department of Highways and Transportation
1221 East Broad Street
Richmond, Virginia 23219

Dear Mr. Hundley:

I have reviewed the Draft Envirnomental Impact/Section 4(f) Statement on Route 199, Project: 0199-965-101. PE-100 James City and York Counties. The draft statement was reviewed by Eastern State Hospital administration because the proposed Route 199 alternatives have implications for patients and employees of the hospital. The hospital administration reviewed alternative A1 which crosses back acreage of the hospital grounds and determined that this alternative route be at sufficient distance so as not to cause concern for patient safety or disturbance due to noise.

After review, I concur with Eastern State Hospital administration, that the proposed project: 0199-965-101. PE-100 James City and York Counties will yield positive benefits for the hospital and local mental health programs as well as the community at large.

Sincerely,

Howard M. Cullum
Acting Commissioner

HMC/agh

cc: David Pribble, Eastern State Hospital
Rubyjean Gould

HARLAND BARTHOLOMEW AND ASSOCIATES
RECEIVED
RICHMOND, VA.

RECEIVED
FEB 27 1986
ENVIRONMENTAL
QUALITY DIV.

Disposition:

No response required.

THE COLLEGE OF WILLIAM AND MARY
VIRGINIA INSTITUTE OF MARINE SCIENCE
SCHOOL OF MARINE SCIENCE

RECEIVED
MAR 25 1986
ENVIRONMENTAL
QUALITY DIV.

March 21, 1986

Mr. R. L. Hundley
Environmental Engineer
Department of Highways & Transportation
1221 East Broad Street
Richmond, VA 23219

RE: Route 199 Draft Environmental/Section 4(f) Statement

Dear Mr. Hundley:

We have reviewed the above referenced document from an environmental perspective and our comments are presented below. The Virginia Institute of Marine Science is fully aware of the myriad of other factors which the VDH&T must consider in their deliberations. Environmental concerns are but one facet of the overall decision-making process.

Generally speaking, we would recommend the "A-1" alignment alternative as the best from our viewpoint. Alignment alternative "D" involves major alteration of aquatic habitat potentially impacting marine migratory fishes as well as palustrine native species and general water quality within the watershed. If alignment "D" is chosen, the mitigative measures proposed will be of minimal value because of the major stream-bottom and wetland manipulation which will be required for construction.

Because of the many questions remaining with regard to the ecological effectiveness of compensating for wetland loss by establishing new wetland areas elsewhere, we would recommend avoiding the loss or minimizing it in the initial design phases whenever possible rather than relying on compensation alone as a mitigative tool. This may also have significant economic benefits as well.

We concur with the proposal to create emergent palustrine wetlands as compensation for unavoidable wetlands losses, but it is with the understanding that this is not being done on a value basis vs. palustrine riparian forest. It is most likely that the values of these forested areas simply cannot be replaced. Thus the recommendations to avoid the loss initially where feasible.

Gloucester Point, Virginia 23062 (804) 642-7000

March 21, 1986

If I may answer any questions regarding these comments, please do not hesitate to contact me.

Sincerely,

Thomas A. Barnard, Jr.
Associate Marine Scientist

TAB/jh

Disposition:

A Revised Line A has been selected. In response to comments regarding the wetland replacement ratio, it is currently Departmental policy to mitigate wetland losses on a 1 to 1 ratio.

P.A. File

THE COLLEGE OF WILLIAM AND MARY
WILLIAMSBURG, VIRGINIA 23185

DEPARTMENT OF BIOLOGY
(804) 253-4240

APR 17
SUFFOLK DISTRICT

April 14, 1986

Mr. C. A. Nash, Jr.
District Engineer
Department of Highways and Transportation
P. O. Box 1070
Suffolk, Virginia 23434

Dear Mr. Nash:

Seven years ago, as part of the previous public hearing on the location of Route 199. I notified the VDH&T of the historical occurrence of a rare native orchid, the small whorled pogonia, on Chisel Run in the vicinity of proposed line A. I indicated then that I was actively trying to locate the population that had been monitored there over a period of sixty years by various members of the Biology Department of the College. [Upon the death of Dr. J. T. Baldwin in 1974, knowledge of the exact location of the colony had apparently been lost.] After several seasons spent searching the area, in 1982 we located a large colony [127 plants in 1985], just 95 feet downslope from the surveyed right-of-way. This colony is by far the largest south of New England and is among the ten largest anywhere in the range of the species. It particularly merits study because of its size, geographic location, and population structure. I have been monitoring it on a plant-by-plant basis for the past two years and will be initiating further studies of its population ecology and habitat this season, under the sponsorship of the Virginia Bureau of Plant Protection.

In view of the fact that placement of a roadway on the slopes directly above the location of these plants would severely alter the habitat, I appreciate that the VDH&T has responded to the dilemma with the positive action of offering the alternative variation Line A-1. This variation, which is 0.4 longer than Line A, moves the roadway westward into the watershed of the adjacent tributary and thereby prevents radical changes in the drainage, humidity, and insolation of the habitat of the orchid. After studying the placement of line A-1 in relation to topographic contours, it appears that it may be

Mr. C. A. Nash, Jr.
April 14, 1986
Page 2

possible to reduce the magnitude of this bypass arc and still adequately protect the colony. Such a reduction would reduce the negative effects on an adjacent landowner and would also reduce the overall roadbuilding costs. I encourage efforts in this direction.

Thank you very much for your concern and cooperation in this matter.

Sincerely yours

Donna M. E. Ware

Donna M. E. Ware
Curator, Herbarium

DMEW:cas

Disposition:

A Revised Line A has been selected. A biological assessment (Section 7) of this alignment is included in the appendix of this document.

6.1.3 Local Agencies and Organizations

P.H. File

CITY OF WILLIAMSBURG
WILLIAMSBURG, VIRGINIA
23185

OFFICE OF THE MAYOR

April 23, 1986

RECEIVED
APR 25
SUFFOLK DISTRICT

Mr. C. A. Nash, Jr.
District Engineer
Department of Highways and Transportation
Suffolk, Virginia 23434

RE: Proposed Route 199

Dear Mr. Nash:

The Williamsburg City Council has discussed the above project and makes the following comments on behalf of the City of Williamsburg.

1. This proposed road is urgently needed by the entire Williamsburg area and should be funded and commenced without further delay. The Project should run from Route 5 to Interstate 64.

2. The section of proposed Route 199 between Route 5 and Route 60 lies entirely within James City County and it is our recommendation that you follow the Route chosen by James City County.

3. On the section of proposed Route 199 from Route 60 to Interstate 64, we recommend that alternate A-2 be used. We are opposed to the southernmost alternate because it appears to be located so it may have an adverse effect on the primary springs and streams that flow into our City Reservoir. The northern limit of the Reservoir appears to be very close to the proposed southern alternate.

Thank you for your consideration of the points made in this letter.

Very truly yours,

Robert C. Walker
Mayor

RCW/ao

Disposition:

A revised Line A with the A-2 segment has been selected.

83

The Colonial Williamsburg Foundation
Williamsburg, Virginia 23187

Vice President's Office

March 31, 1986

Mr. Frank Hall
Resident Engineer
Virginia Department of Highways
and Transportation
Ironbound Road
Williamsburg, VA 23185

Dear Mr. Hall:

Colonial Williamsburg strongly endorses the construction to complete Route 199 in James City County and York County at the earliest possible date.

As a leading travel attraction in Virginia and a major local employer, Colonial Williamsburg has been an enthusiastic proponent of Route 199 since the beginning of the project as evidence by our donation of right of way for a portion of the roadway now completed. Traffic studies completed over the years by the Department of Highways and Transportation, local governments, and others, including us, consistently indicate this circumferential loop is increasingly vital to the movement of local traffic and the efficient accommodation of millions of tourists each year.

We urge expeditious completion of Route 199 as a means of overcoming growing traffic congestion in the greater Williamsburg area and the resulting impediment to tourism and its benefits to the citizens of Virginia.

Thank you for including this correspondence in the testimony presented at the public hearing on April 3, 1986 at Lafayette High School.

Sincerely,

Norman G. Beatty

Norman G. Beatty
Media and Government
Relations

Disposition:

None required.

Mailing Address:
P.O. Box JC
Williamsburg, Va.
23187-3627
Tel. 253-6685

DEPARTMENT OF PLANNING AND DEVELOPMENT
COUNTY GOVERNMENT CENTER, 101 MOUNTS BAY ROAD

RECEIVED
APR 10 1986
SUFFOLK DISTRICT

April 7, 1986

Mr. C. A. Nash, Jr.
District Engineer
VDH&T
P.O. Box 1070
Suffolk, VA 23434

Dear Mr. Nash:

I have several questions and comments about specific statements in the draft Environmental Impact Statement for Route 199. They are as follows:

1. Do the costs given on page S-4 include expected costs for environmental mitigation (e.g., noise barriers, wetlands re-creation)? If not, can a more realistic total cost estimate be prepared for each alternative? Can costs for the York County and James City County segments be presented separately?

2. Page 1-1 indicates there is to be an at-grade intersection on the Warhill Tract. This intersection is nowhere shown on maps or mentioned elsewhere in the EIS. Please explain.

3. Page 2-1 mentions that the Board of Supervisors of James City County passed resolutions in support of Route 199 in 1976 and 1978. The Board of Supervisors has passed resolutions in support of Route 199 in the past four years as well.

4. Page 3-2 mentions no access is proposed at Olde Towne Rd. (Route 658). The Board of Supervisors has gone on record in the past supporting a connection at that location.

5. Page 3-3 states service roads will be constructed along Alignment A in York County. As a note, the Board of Supervisors has gone on record supporting the controlled access nature of Route 199 on its entire length.

6. Figure 4-3 shows traffic on Longhill Rd. west of Eastern State Hospital dropping precipitously under Alignment D, far below the A or A-1 alignments. Is this a realistic expectation given the anticipated development of Ford's Colony (1,976 dwelling units), Longhill Gate (146 units) and the expansion of Windsor Forest and Ford's Colony (east)?

7. Page 4-9 indicates that there are no traffic signals outside the City of Williamsburg. Actually, there are several in James City County. Does this inaccuracy affect the conclusions regarding traffic volumes or intersection improvements?

8. Page 4-24 refers to the "new municipal center." This apparently refers to the County government (not municipal) complex, which is approaching 10 years old. It is no longer considered "new."

9. Page 4-25 states the majority of County recreation facilities are located near the City. The County now operates two major parks, one on Ironbound Road and one on Leisure Road. The EIS statement is no longer true.

10. Page 4-48 refers to Dow-Badische Company. The correct name is BASF Fibers.

11. Page 5-6 states that James City County permits mobile homes on industrial lots. This is incorrect. Mobile homes are permitted, with a special use permit, on individual lots in the General Agricultural zone.

12. Page 5-7 states Indigo Terrace is a middle-income area with a high percentage of mobile homes and deteriorating structures. The first half of the statement is true; the second half is not.

13. Page 5-17 contradicts page 3-2 by stating that emergency access is proposed at Olde Towne Road.

14. Page 5-18. The correct spelling is Tewning Road.

15. Page 5-30. It would be helpful for the EIS to explain what a "NAC" is.

16. Please provide a breakdown of noise mitigation costs by alternative by County, based upon VDH&T's policy of constructing noise barriers if the cost is under $25,000 per receptor.

17. Would construction of Alignment D affect the County's flood insurance eligibility or rating?

Thank you for the opportunity to comment on the draft EIS for Route 199. If there are any questions about my comments, please call me.

Sincerely,

Victoria Gussman

Victoria Gussman
Director of Planning

VG/mfr
1206a

Disposition:

1. The costs listed in Table S-1 on page S-4 of the DEIS do not include the costs for environmental mitigation. The separation of costs for James City and York Counties will not be prepared as part of the Corridor Study. Costs for the required environmental mitigation are calculated during the final design stage.

2. The Virginia Department of Transportation has included possible access to Route 199 from Warhill Tract to accommodate the probable intense development in the area. The Traffic and Transportation Technical Report under the section entitled Route 199 Operations on page 64 explains this intersection and will be incorporated in section 4.1.2 of the FEIS.

3. No response.

4. As outlined in Mr. H. M. Shaver's letter of May 2, 1986, the Virginia Department of Highways and Transportation support the original recommendations submitted to the Highway Commission in April 1979. These recommendations conclude that an interchange at Old Towne Road would be undesirable due to the close proximity of the interchange at Route 612.

5. No response.

6. Presuming this comment compares Figure 4-3 for Alignments A and A-1 with Figure 4-4 for Alignment D, there should be a decrease in traffic on Longhill Road west of Eastern State Hospital for the D Alignment. Alignment D directly serves the residential developments mentioned and therefore takes traffic off of Longhill Road. Using Alignments A and A-1, however, the occupants of these residential developments must continue to use Longhill Road which increases the traffic volumes on Longhill Road as well as other local roads. The traffic forecasts shown on Figures 4-3 and 4-4 considered future land development in the area based on the information available prior to October 1985.

7. The statement on page 4-9 of the DEIS has been changed to read: "Other than along Route 60, there are not traffic signals located on the street system outside Williamsburg."

   Route 60 was analyzed as an urban arterial. Results from the capacity analysis are shown on Tables 4-2 and 4-3. On page 71, the Traffic Technical Report gives a full description of the street system evaluation.

8. The statement on page 4-24 of the DEIS has been changed to read: "The municipal center lies adjacent to Kingsmill....."

9. The statement on page 4-25 of the DEIS has been changed to read: "James City County community recreational facilities lie in the more densely populated Williamsburg area and two major parks are located on Ironbound Road and Leisure Road."

10. Dow Badische Company has been changed to BASF Fibers.

11. The sentence stating that "James City County is the only regional jurisdiction that permits placement of mobile homes on industrial lots, "has been changed to read: "Mobile homes are permitted with a special use permit on individual lots in the General Agricultural zone."

12. This statement has been changed to read: "Indigo Terrace/Brookhaven Drive is a middle-income area, with a high percentage of mobile homes.

13. The statement on page 3-2 of the DEIS has been changed to read: "Access to Route 658 is limited to an emergency access for recently-completed fire station, direct access to Alignment A via a ramp would not be provided.

14. The spelling of Towning Road is corrected.

15. A definition of NAC has been included in pages 4-45 and 4-46.

16. A computer analysis of projected noise levels has been completed and included in Section 5.9 of this document. Those sites which cost under $20,000 per receptor are discussed in Section 5.9.2.

17. The Virginia Department of Transportation is required to design and construct the facility so that it conforms to all floodplain regulations. Therefore, the D alignment would not affect James City County's flood insurance eligibility or rating.

P.H. File

Mailing Address:
P.O. Box JC
Williamsburg, Va.
23187-3627
Tel. 253-6609

JAMES CITY COUNTY

BOARD OF SUPERVISORS
COUNTY GOVERNMENT CENTER, 101 MOUNTS BAY ROAD

SUFFOLK DISTRICT

Board of Supervisors
WILLIAM F. BROWN
PERRY M. DEPUE
JACK D. EDWARDS
THOMAS D. MAHONE
STEWART U. TAYLOR

April 11, 1986

Mr. C. A. Nash, Jr.
VDH&T
Suffolk, VA. 23434

I did not speak at the Location Public Hearing conducted for Route 199 (RTE 5 to I64) because many of my ideas were expressed by others.

I would like to add a couple thoughts at this time. This is a terribly important project to our community. We are working to control our accelerated growth but we are not empowered to stop it. The highway system is already overloaded at rush hours to the extent that life and safety are threatened. (Free passage of emergency vehicles). This road will greatly enhance commercial interests by way of relieving Route 60 Williamsburg of commuter traffic.

The Board of Supervisors and County Planning Department are seeing developmental pressure in the proposed Route 199 area growing at an exponential rate. The earlier adopted corridor has elapsed and we don't have the power to stop intense development along Longhill Road. As an example Longhill Gate multi-family development in corridor "D" has been designed, approved, recorded and will break ground in the weeks ahead. For this and environmental reasons alternate "D" does not warrant further consideration. I think you can see the need for re-establishing the corridor as promptly as possible. We have recorded one developer intent to donate Right-of-Way to the project and are considering one across the Warhill Tract now (about a mile). The time is right to not only re-establish the corridor but to get on with following phases of establishing the road.

Disposition:

Revised Line A has been selected.

Mailing Address:
P.O. Box JC
Williamsburg, Va.
23187-3627
Tel. 253-6609

JAMES CITY COUNTY

BOARD OF SUPERVISORS
COUNTY GOVERNMENT CENTER, 101 MOUNTS BAY ROAD

Board of Supervisors
WILLIAM F. BROWN
PERRY M. DEPUE
JACK D. EDWARDS
THOMAS D. MAHONE
STEWART U. TAYLOR

TO: Mr. Nash April 11, 1986

In closing I would add that I have lived in Kingspoint Subdivision for fiteen years, my home being less than 1000 feet from the existing leg or Route 199. The coming of 199 to my area has improved the quality of my life as well as for thousands of others. For example,I no longer have to creep through Williamsburg at 6 in the morning and wade through tourist traffic in the afternoon to commute to my Newport News job.

I would like to thank you and the Department of Highways staff for your efforts on behalf of establishment of Route 199.

Cordinally,

Thomas D Mahone
Thomas D. Mahone

TDM:bdw

cc
F. N. Hall
BOS
J. B. Oliver

Disposition:

No response required.

RESOLUTION

Recommended Corridor - Route 199

WHEREAS, the James City County Comprehensive Plan, the Peninsula Planning District's Major Thoroughfare Plan, and the State Transportation Plan conclude that the extension of Route 199 to Interstate 64 is essential to permit the safe and efficient movement of traffic in the James City County-Williamsburg area; and

WHEREAS, Alignment "A" is in agreement with the James City County Comprehensive Plan and has been relied upon by citizens and public officials since its endorsement by the Highway Commission in 1979.

THEREFORE, BE IT RESOLVED by the Board of Supervisors of James City County, Virginia, that alignment "A" or an environmentally acceptable variation of that alignment be designated as the Route 199 corridor in James City County by the State Highway and Transportation Board.

BE IT FURTHER RESOLVED that the Board of Supervisors of James City County, Virginia unanimously endorses that:

1. Route 199 be constructed along its entire length as a controlled access facility, and

2. Corridor alignment, design, and construction be carried out as quickly as possible.

William F. Brown, Chairman
Board of Supervisors

ATTEST:

James B. Oliver, Jr.
Clerk to the Board

Adopted by the Board of Supervisors, James City County, Virginia, this 7th day of April, 1986.

VG/pdc
BOS01

SUPERVISOR	VOTE
BROWN	AYE
DEPUE	AYE
EDWARDS	AYE
MAHONE	AYE
TAYLOR	AYE

Disposition:

No response required.

P.H. File

The Nature Conservancy

Virginia Chapter · 619-B East High Street · Charlottesville, Virginia 22901
(804) 295-6106

George H. Fenwick
Virginia Director

APR 14
SUFFOLK DISTRICT

April 10, 1986

VIRGINIA CHAPTER OFFICERS

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Richmond

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Accomac

JOHN B. VAUGHAN
Galax

Mr. C. A. Nash, Jr.
District Engineer
Virginia Department of Highways
and Transportation
P.O. Box 1070
Suffolk, VA 23434

Re: Proposed route of Rt. 199 James City County, Virginia

Dear Mr. Nash:

The Nature Conservancy is a national conservation organization. We are committed to the preservation of natural diversity by protecting lands and waters supporting the best examples of all elements of our natural world. The Virginia Chapter, based in Charlottesville, has protected over 115,000 acres in the Commonwealth since 1956. We currently have a membership of 8,500 in Virginia. Our goal is to identify and protect the best remaining natural areas in Virginia. This is done by locating the occurrences of endangered, threatened and rare plants, animals and natural communities, and then arranging for their protection. Protection may be provided in a variety of ways ranging from purchasing critical lands to arranging for voluntary protection with individual landowners.

We would like to express our concern over the proposed routing of Route 199 in James City County. Our concerns relate to Alternative A which would severely impact Virginia's best population of the small whorled pogonia (Isotria medeoloides).

Mr. C. A. Nash, Jr.
April 10, 1986
Page Two

This plant is one of the rarest species in Virginia with a total state population of fewer than 150 individual plants in three known locations. It is listed as an endangered species by the U.S. Fish and Wildlife Service, and is one of only three plant species listed by the Virginia Department of Agriculture and Consumer Services.

The Nature Conservancy recognizes the area along Alternative A as one of the most significant natural areas in Virginia. Therefore, in order to achieve some protection for this area, we entered into a protection lease agreement with the landowner in 1984 to cover the most critical 20 acres of habitat. This agreement demonstrates a commitment by both parties to help ensure the preservation of the small whorled pogonia. We consider this one of our most important preserves in Virginia. We have worked with Dr. Donna Ware of the College of William and Mary to help monitor and conduct research at the site.

Alternative A will bisect these 20 acres that we have sought to preserve and would severely impact the plant's habitat. However, if Alternative A is chosen with the implementation of the A-1 or similar alternative, the area of concern will remain undisturbed. Therefore, The Nature Conservancy supports the A-1 alternative as the most viable means to meet both the protection of an endangered species and the construction of Rt. 199. We would be glad to provide any additional information regarding the status of the small whorled pogonia as well as the importance of the habitat in question.

Thank you for your consideration in this matter.

Sincerely,

George H. Fenwick
Virginia Director

Disposition:

Revised Line A which does not impact the endangered species (Isotria Medeoloides) has been selected.

RESOLUTION

Recommended Corridor - Route 199

WHEREAS, the James City County Comprehensive Plan, the Peninsula Planning District's Major Thoroughfare Plan, and the State Transportation Plan conclude that the extension of Route 199 to Interstate 64 is essential to permit the safe and efficient movement of traffic in the James City County-Williamsburg area; and

WHEREAS, Alignment "A" is in agreement with the James City County Comprehensive Plan and has been relied upon by citizens and public officials since its endorsement by the Highway Commission in 1979.

THEREFORE, BE IT RESOLVED by the Board of Supervisors of James City County, Virginia, that alignment "A" or an environmentally acceptable variation of that alignment be designated as the Route 199 corridor in James City County by the State Highway and Transportation Board.

BE IT FURTHER RESOLVED that the Board of Supervisors of James City County, Virginia unanimously endorses that:

1. Route 199 be constructed along its entire length as a controlled access facility, and

2. Corridor alignment, design, and construction be carried out as quickly as possible.

William F. Brown, Chairman
Board of Supervisors

ATTEST:

James B. Oliver, Jr.
Clerk to the Board

Adopted by the Board of Supervisors, James City County, Virginia, this 7th day of April, 1986.

SUPERVISOR	VOTE
BROWN	AYE
DEPUE	AYE
EDWARDS	AYE
MAHONE	AYE
TAYLOR	AYE

Disposition:

A revised Line A has been selected.

RESOLUTION

Route 199 Location

WHEREAS, the Planning Commission of James City County has evaluated the proposed locations for the extension of Route 199 in James City County and found alignment "A" or "A-1" in combination with "A" to be superior to alignment "D" for reasons of environmental and residential impacts; and

WHEREAS, in 1979 the Planning Commission of James City County resolved to support the location of Route 199 in alignment "A"; and

WHEREAS, in the same year the Virginia Department of Highways and Transportation selected alternative "A" as the location for Route 199 in James City County; and

WHEREAS, on June 28, 1982 the Board of Supervisors of James City County adopted a Comprehensive Plan establishing the location of Route 199 on alignment "A", and since then that alignment has been recognized in long-range planning efforts and used as a basis for zoning decisions, subdivision and site plan approvals, and the placement of public buildings.

THEREFORE, BE IT RESOLVED that the Planning Commission of James City County does hereby request Route 199 in James City County follow alignment "A" or "A-1" in combination with "A" in James City County, and further, that Route 199 in James City County be expeditiously designed and constructed.

Fred Belden, Chairman
Planning Commission

ATTEST:

Victoria Gussman
Secretary

Adopted by the Planning Commission, James City County, Virginia, this 25th day of March, 1986.

VG/js
BOS01

Disposition:

A revised Line A has been selected.

MEMORANDUM

DATE: March 26, 1986

TO: Frank N. Hall, Resident Highway Engineer

FROM: The James City County Historical Commission Task Force on Rt. 199

SUBJECT: A Recommendation Concerning Alternative Routes of Rt. 199

The James City County Historical Commission Task Force has reviewed the impact the proposed routes of Highway 199 will have on the County's historical and cultural resources and makes the following report and recommendation.

Alternative route A and A-1 will destroy or endanger fourteen archaeological sites and six potential sites. Eight of the fourteen are those of prehistoric Native Americans with the majority dating to the Middle Woodland period, 500 B.C. to 900 A.D. Most of these sites are associated with Chisel Run and its branches. Five of the archaeological sites are thought to be the locations of mid- to late-nineteenth century and early twentieth century farm houses. One is an early to mid-nineteenth century mill site. Alternative A will also destroy one standing mid-nineteenth century farm house.

Alternative D will destroy or endanger eighteen archaeological sites, as well as two potential ones. One of the eighteen is the location of a mid-nineteenth century farm house, another is an early twentieth century cemetery, and the remaining sixteen are prehistoric sites. Again, the majority date to the Middle Woodland period and almost all are located near Powhatan Creek and along Longhill Swamp.

The number of prehistoric sites so far discovered in James City County is very small. In fact, most of the known ones are those endangered by the proposed routes of Highway 199. These endangered sites are part of a Middle Woodland settlement system that saw main camps on the edge of the James River and a number of large and small procurement camps stretching inland along Powhatan Creek and its branches, especially Longhill Swamp. This is an important point because it means that the environmental and cultural context of these sites is still largely intact. One reason the Historical Commission supports the Powhatan Creek and Longhill Swamp Wetland Acquisition Capital Improvements Program is that it protects this context. In fact, these sites appear interesting enough to warrant even further protection. The Historic Commission may wish to explore the possibility of nominating them to the National Register as an Archaeological District. Also, the authors of Towards a Resource Protection Process recommend that prehistoric sites such as those along Powhatan Creek and Longhill Swamp be preserved in place, unexcavated. This needs to be done until more prehistoric sites are located in the County, at which time it will be possible to better measure their significance.

Memo to Frank N. Hall
March 26, 1986
Page 2

Although our knowledge of the nineteenth century is far greater than that of the Middle Woodland period, the sites of nineteenth century farm houses are also important historic resources. This is especially true of those of small farmers who, in the nineteenth century, continued the agricultural heritage of the County and who have received little historical attention. Often sites such as these are destroyed without hesitation. Instead, it would be better if they must be destroyed that the information they can convey be preserved through careful archaeological excavation. The one standing structure endangered, the Lane House, was the subject of an architectural survey several years ago and was thought then not to meet National Register criteria. However, this issue should be reexamined. In any case, the Highway Department should explore the possibility of adjusting the alignment of Alternative A to avoid destroying the house. This would spare it so that it may be appropriately preserved in the future.

In a County as rich as this one in historically important locations, it is difficult to decide which Alternative poses the least damage to the County's cultural resources. However, on balance, the lack of comparative knowledge about the County's prehistoric sites makes it more imperative that known ones be preserved in situ and since Alternative A and A-1 endanger fewer prehistoric sites (as well as fewer sites overall) the James City County Historical Commission Task Force on 199 recommends to the State Highway Commission that it accept Route 199 Alternative A or A-1 and reject Alternative D.

0424f

cc: James B. Oliver, Jr.
James City County Board of Supervisors
James City County Historical Commission Members

Disposition:

The Lane Farm House was re-examined and the Virginia Division of Historic Landmarks agree that there was no significant impact on architectural structures. A Phase II archaeological survey has been conducted and included in this report.

Recommendations for Phase III investigation are also made in Section 5 of this report.

WILLIAMSBURG-JAMES CITY COUNTY
PUBLIC SCHOOLS

JOHN E. ALLEN, *Superintendent*

OFFICE OF OPERATIONS
Paul C. Ogg, *Director*

STATEMENT ON THE PROPOSED
ROUTE 199 HIGHWAY PROJECT
LAFAYETTE HIGH SCHOOL, JAMES CITY COUNTY, VIRGINIA

APRIL 3, 1986

I am Paul C. Ogg, Director of Operations of the Williamsburg-James City County School Division. My purpose this evening is to remind you that Longhill Road is a major road between Lafayette High School and James Blair Intermediate School. We have 50 school buses that, twice a day, provide transporation for students between these two schools. Therefore, I am asking that in your planning and design of the 199 extension that you carefully consider and plan for the Longhill Road crossing of Route 199. If at grade level, that is, there is no overpass/underpass at this crossing, then the design of this intersection must consider the safe passage of these 50 school buses between Lafayette and James Blair schools. Thank you.

305 First Street • Williamsburg, Virginia 23185 ■ Telephone (804) 220-1393

DISPOSITION:

Interchanges are proposed at all major crossings of Route 199 including Longhill Road (Route 612). Since there is an interchange proposed at Longhill Road to control traffic, at grade conflicts are not anticipated with the school buses providing transportation to Lafayette and James Blair Schools.

-66-

No. R86-98 (R)

BOARD OF SUPERVISORS
COUNTY OF YORK
YORKTOWN, VIRGINIA

Resolution

At a regular meeting of the York County Board of Supervisors held in the Courts and Board Room, York County Courts and Office Center, Yorktown, Virginia, on the 20th day of March, 1986:

Present	Vote
Benjamin M. Rush, Jr., Chairman	Yes
Julia A. Jensen, Vice Chairman	Yes
E. S. Bingley, Jr.	Yes
Rodgers A. Smith	Yes
E. Tabb Smith	Yes

On motion of Mr. T. Smith, which carried 5:0, the followin resolution was adopted:

A RESOLUTION TO EXPRESS THE POSITION OF THE YORK COUNTY BOARD OF SUPERVISORS WITH RESPECT TO THE CORRIDOR LOCATION ALTERNATIVES FOR PROPOSED ROUTE 199

WHEREAS, the Virginia Department of Highways and Transportation is considering corridor location alternatives for the proposed extension of Route 199 from Route 5 in James City County northward to the Interstate Route 64 interchange at Route 646 (Exit 55) in York County; and

WHEREAS, the Department has identified three (3) corridor alternatives for the portion of the project located in York County between Route 60 and Interstate 64; and

WHEREAS, the York County Board of Supervisors has consistently supported the construction of proposed Route 199 recognizing that the proposed route will help to alleviate serious traffic capacity and safety problems along existing Route 646 between Interstate 64 and Route 60; and

WHEREAS, in its support of proposed Route 199 the Board has consistently requested that consideration be given to providing two (2) appropriate points of access from the proposed limited access highway to the Route 646 corridor; and

WHEREAS, after careful evaluation of the alternative corridor locations the Board has concluded that Alignment A-2 is most consistent with and supportive of the County's development objectives for the corridor between Interstate 64 and Route 60;

NOW, THEREFORE, BE IT RESOLVED by the York County Board of Supervisors, this the 20th day of March, 1986, that the Board does hereby indicate its support of corridor alignment A-2 for proposed Route 199 between Interstate 64 and Route 60;

BE IT FURTHER RESOLVED that the Board does hereby reiterate its previous requests that consideration be given to the establishment of three (3) access points along this segment of proposed Route 199 to include specifically the relocation of the intersection of Rochambeau Drive as close to its current position as safe design practices will allow.

BE IT STILL FURTHER RESOLVED that the Board strongly endorses the construction of an intersection of Route 603 with the proposed Route 199 and respectfully insists its inclusion in the project in furtherance not only of safe and efficient traffic flows by reducing the congestion and turning movements at the proposed Route 60 intersection, but also in promoting the health, safety, and general welfare of the citizens of our community.

BE IT STILL FURTHER RESOLVED that in endorsing the Line A-1 alternative, the Board is particularly concerned with its precise alignment and configuration at the Rochambeau Drive/Interstate 64 terminus, and is requesting that the final design provide a solution which is most equitable to residents, property owners, and proposed commercial developments.

A Copy Teste:

John M. Richardson
County Administrator

Disposition:

Revised Line A has been selected. This alignment incorporated the A-2 segment discussed in the document. The distance of this segment precludes the possibility of having 3 access points. Connections are provided with Route 646 and 168.

PENINSULA
PDC PLANNING DISTRICT COMMISSION
2017 CUNNINGHAM DRIVE HAMPTON, VA. 23666
A.C. 804 - 838 - 4238

March 1, 1985

Mr. R. L. Hundley
Environmental Engineer
Virginia Department of Highways
and Transportation
1221 East Broad Street
Richmond, Virginia 23219

Re: Route 199 Environmental Study

Attention: Vincent J. Valenti

Dear Mr. Hundley:

I am in receipt of your letter of February 25, 1985 to Mr. Frank Force regarding the development of a Draft Environmental Impact Statement for Route 199. This is to inform you that I have designated Mr. Joseph D. Paulus as the Commission's contact person for future coordination on this study.

Sincerely yours,

Henry M. Cochran
Executive Director

/lw

cc: Joseph D. Paulus

Disposition: No response required.

RECEIVED
MAR 4 1985
ENVIRONMENTAL DIV.

6.2 PUBLIC INVOLVEMENT

The public involvement process being implemented with this study is in accordance with the Council on Environmental Quality and Federal Highway Administration regulations. It was designed to inform governmental agencies, public organizations, and the public at large of the progress of the project and to solicit comments during the conceptual stage. Methods to be employed to accomplish this include personal contacts, mailings, legal advertisements, a public information workshop and a location public hearing.

During the week of March 11, 1985, a meeting was held with representatives of the jurisdictions of James City County, City of Williamsburg, York County and the Peninsula Planning District Commission to discuss public perceptions of the Route 199 project in order to determine the need for public involvement meetings. It was the opinion of each jurisdiction that while the citizens of the area generally support the project, specific questions and limited objections had been expressed in the past. Based on these discussions, it was determined that at least one public information meeting should be held. These meetings were held on April 2 and 3, 1988, subsequent to approval of the draft EIS for public availability by FHWA and prior to the location public hearing which was held April 3, 1986.

6.2.2 Public Hearing & Informational Meeting/Comments & Responses

Comments were received at the public hearing on April 3, 1986 and during the official comment period which was extended to April 17, 1986. The comments made during the public hearing and official comment period stated and addressed with an appropriate disposition in this section of this Fial Environmental Impact Statement.

The following list summarizes the verbal comments and questions received from citizens, organizations, businesses, local governments and other groups at the public hearing held on April 3, 1986 at 7:00pm at the Lafayette High School in Williamsburg, Virginia. This list indicates the name of the commentor, a summary of their remarks and a response to their comments. The comments are written in their entirity in the transcript of the Location

School. A complete transcript of the Public Hearing is held in the Virginia Department of Transportation Route 199 project files.

1. William Gallimore (York County Resident)

   Comment

   Supports an alignment that would follow Route 60 track west to 607 and I-64 or Alignment D.

   Disposition

   Support Letter - no response.

2. Carolyn Lowe (Williamsburg Area League of Women Voters)

   Comment

   Concerned with the wetlands potentially impacted by Alternate D. Questioned the finding of no impact on groundwater resources and soils information for all of the alternates. Supports Alignment A-1 because it protects the small-whorled pogonia.

   Disposition

   Potential long-term impacts to groundwater resources are discussed in section 5.10.2 of the FEIS. Revised Line A which protects the small-whorled pogonia has been selected.

3. John Benninghove (York County Resident)

   Comment

   Support Alignment D.

   Disposition

   Support letter - no response.

4. Mary Gallimore (York County Resident)

   Comment

   Supports a widening of Route 646 instead of construction of Route 199.

   Disposition

   The construction of Route 199 is a part of the regional transportation plan.

5. George Grayson (York County Resident)

Comment

Support Alignments A and A-1.

Disposition

Support Letter - no response.

6. Bob Ripley (Attorney respresenting Mr. Horsworthy)

Comment

Supports Alignment A based on the 1979 approved by the York County Board of Supervisors.

Disposition

This is a restudy of all alternatives for Route 199.

7. Dan De Young (Engineer for Mr. Norsworthy)

Comment

Expressed concern with the location of Alignment A-2. Support Alignment D. Submitted a map.

Disposition

Displacements and future development were considered for each alignment. Support letter - no response.

8. Jack Cary (Windsor Forest Resident - James City County)

Comment

Concerns were expressed to wetlands and archaeological sites located along Alignment D. Supports Alignment A.

Disposition

Support letter - no response.

9. Virginia Cary (Windsor Forest Resident - James City County)

Comment

Supports Alignment A.

Disposition

Support letter - no response.

10. Anne Kelly (Windsor Forest Resident - James City County)

Comment

Supports Alignment A.

Disposition

Support letter - no response.

11. Jim Yankovich (Windsor Forest Resident - James City County)

Comment

Supports Alignment A.

Disposition

Support letter - no response.

12. Wally Smith (Windsor Forest Resident - James City County)

Comment

Supports Alignment A.

Disposition

Support letter - no response.

13. William D. Johnson, Jr. (Windsor Forest Resident - James City County)

Comment

Supports Alignment A.

Disposition

Support letter - no response.

14. Bobby Hornsby (Windsor Forest Resident - James City County)

Comment

Supports Alignment A.

Disposition

Support letter - no response.

15. Donna M. E. Ware (Department of Biology, College of William and Mary)

Comment

Opposes Alignment A due to the presence of the endangered species (small-whorled pogonias) on the slopes of Chisel Run. Supports the reduction in magnitude of the arc of the bypass, while still protecting the colony of endangered plants.

Disposition

A Section 7 - Biological Assessment was conducted on this suggested alternative and Revised Line A, the selected alternatives.

16. Steve Croy (Virginia Chapter of the Nature Conservancy)

Comment

Opposes Alignment A due to the presence of the small whorled pogonia.

Disposition

Revised Line A was selected to protect the small whorled pogonia.

17. V. M. Geddy, Jr. (Attorney representing Ford's Colony)

Comment

Supports Alignment A-1 with the reduction in the magnitude of the arc of the bypass.

Disposition

Support letter - no response.

18. John Matthews (York County Board of Supervisors)

Comment

Supports two intersections between I-64 and Route 60 because of a planned fire station and other emergency facilities in York County.

Disposition

Intersections were studied in this area; however, the distance between Route 60 and I-64 is insufficient for construction of two access points.

19. Thomas Powers (James City County Resident)

Comment

Expressed concern that the Strawberry Plains Road, Route 616, would be terminated as a cul-de-sac.

Dispositon

Route 199 does not terminate at Route 616, but is terminated at Route 5. The project description in the summary section of the FEIS clarifies this point.

20. G. A. Moser (Endangered Species Branch, Fish and Wildlife Service)

Comment

Supports Alignment A-1 or a similiar alternative which would avoid impacting the endangered species, the small whorled pogonia.

Dispositon

Revised Line A which avoids such impacts has been selected.

21. Howard F. Berry (York County Resident)

Comment

Opposes Alignment A.

Dispositon

Support letter - no response.

22. Elizabeth C. Rogers (Soil and Water Conservation District)

Comment

Opposes Alignment D.

Dispositon

Support letter - no response.

23. Verna J. Dickerson (York County Resident)

Comment

Opposes Alignment A-2.

Dispositon

Support letter - no response.

24. Robert F. Sherman (York County Resident)

Comment

Opposes Construction of Route 199.

Dispositon

Support letter - no response.

25. Junius H. Moody (York County Resident)

Comment

Opposes the portion of Route 199 from Route 60 to I-64.

Dispositon

Support letter - no response.

26. Fred Belden (Chairman, James City County Planning Commission)

Comment

Supports Alignment A or A-1.

Disposition

Support letter - no response.

27. Hugh DeSamper (James City County Historical Commission)

Comment

Supports Alignment A or A-1.

Disposition

Support letter - no response.

28. Gilbert L. Granger (Williamsburg City Council)

Comment

Supports the construction of Route 199.

Dispostion

Support letter - no response.

29. Perry De Pue (Member of James City County Board of Supervisors)

Comment

Opposes Alignment D as the James City County comprehensive plan has been based on Alignment A. Supports Alignment A.

Dispositon

Support letter - no response.

30. Preston C. Smith (Williamsburg Pottery Representative)

Comment

Supports Alignment A-2.

Disposition

Support letter - no response.

Written Comments received from citizens following the Location Public Hearing are included in this section.

Jamestown Feed & Seed, Inc.
"Home & Garden-Hardware-Greenhouse"

U.S. Rt. 60, P.O. Box 66
Norge, Virginia 23127

[804] 564-8528

24 March 1986

Mr. Frank Hall
Virginia Department of Highways & Transportation
P. O. Box HD
Williamsburg, Virginia 23187-3608

Dear Mr. Hall:

With respect to various proposed routes and designs of 199 through James City and York Counties, I urge you to recommend adoption as follows:

A. Support of Corridor A-2 through York County as presently recommended by the Virginia Department of Highways and Transportation, with 199 through York County being a limited access road, interchange only at intersection with Rt 60 and I-64, with controlled entrance/exit to Williamsburg Pottery.

B. Support of Corridor A-1 through James City County.

C. Support the Re-signing of I-64 for Eastbound traffic at Exit 53 to include at least the following:

1. Williamsburg Pottery, Outlets Mall - Next three exits.

2. Toano.

The westerly end of Rt 60 in James City County is an important economic base which can be preserved and stimulated by the adoption of the routes recommended above.

Please consider my recommendation as you present the options to be considered at the Corridor Hearing at Lafayette High School on April 3rd, 1986. With kind regards, I am

Respectfully yours,

Jerry C. Ainsworth
President

RECEIVED
MAR 31 1986
PLACE

cc: William F. Brown
100 Kingsmill Road
Williamsburg, Va. 23185

Victoria Gussman
Director of Planning - James City County
P. O. Box JC
Williamsburg, Virginia 23187

Disposition:
Revised Line A which includes Line A-2, has been selected as the preferred alternative.

JAMES M. ANDERSON

ANDERSON'S CORNER SERVICENTER

March 24, 1986

Mr. Frank Hall
Virginia Department of
Highways & Transportation
P. O. Box HD
Williamsburg, Va. 23187-3608

RE: Routes under consideration for the extension of 199 through James City and York Counties

Dear Mr. Hall:

With respect to various proposed routes and designs of 199 through James City and York Counties, I urge you to recommend adoption as follows:

A. Support of Corridor A-2 through York County as presently recommended by the Virginia Department of Highways and Transportation, with 199 through York County being a limited access road, interchange only at intersection with Rt 60 and I-64, with controlled entrance/exit to Williamsburg pottery.

B. Support of Corridor A-1 through James City County.

C. Support of Re-signing I-64 for Eastbound traffic at Exit 53 to include at least the following:

1. Williamsburg Pottery, Outlet Malls - Next three exits.
2. Toano.

The westerly end of Rt 60 in James City County is an important economic base which can be preserved and stimulated by the adoption of the routes recommended above.

Please consider my recommendation as you present the options to be considered at the Corridor Hearing at Lafayette High School on April 3, 1986.

Very truly yours,

cc: William F. Brown
Victoria Gussman

James M. Anderson
Owner & Operator
Anderson's Exxon &
Anderson's Motel

RECEIVED MAR 31 1986 OFFICE

8554 RICHMOND ROAD TOANO, VA 23168
(804) 566-0032

Disposition:

Revised Line A which includes Line A-2 has been selected as the preferred alternative.

WILLIAMSBURG, VA. RECEIVED MAR 25 1986

March 24, 1986

Mr. Frank Hall
Virginia Department of
Highways & Transportation
P. O. Box HD
Williamsburg, Va. 23187-3608

RE: Routes under consideration for the extension of 199 through James City and York Counties

Dear Mr. Hall:

With respect to various proposed routes and designs of 199 through James City and York Counties, I urge you to recommend adoption as follows:

A. Support of Corridor A-2 through York County as presently recommended by the Virginia Department of Highways and Transportation, with 199 through York County being a limited access road, interchange only at intersection with Rt 60 and I-64, with controlled entrance/exit to Williamsburg pottery.

B. Support of Corridor A-1 through James City County.

C. Support of Re-signing I-64 for Eastbound traffic at Exit 53 to include at least the following:

1. Williamsburg Pottery, Outlet Malls - Next three exits.
2. Toano.

The westerly end of Rt 60 in James City County is an important economic base which can be preserved and stimulated by the adoption of the routes recommended above.

Please consider my recommendation as you present the options to be considered at the Corridor Hearing at Lafayette High School on April 3, 1986.

Very truly yours,

Nancy M. Sillery — P.O. Box 204
Colonial Antique Center
Toano, Va. 23168

cc: William F. Brown
100 Kingsmill Road
Williamsburg, Va. 23185

Victoria Gussman
Director of Planning - James City County
P. O. Box JC
Williamsburg, Va. 23187

Disposition:

Revised Line A which includes Line A-2 has been selected as the preferred alternative.

DELMARVA
PROPERTIES INCORPORATED

March 25, 1986

WILLIAMSBURG, VA.
RECEIVED
MAR 26 1986
OFFICE
VA. DEPT. OF TRANS. & TRANSP.

Mr. Frank Hall
Virginia Department of
Highways & Transportation
P. O. Box HD
Williamsburg, Virginia 23187-3608

Re: 199 Connector
James City/York County

Dear Mr. Hall:

I will be unable to attend the public hearing at Lafayette High School on April 3. I, however, offer the following recommendations:

A. Support Corridor A-2 as the favored route between I64 and Route 60. Said extension be limited access with interchanges only at I64 and Route 60 with controlled ingress/egress for Williamsburg Pottery.

B. Support alternate A-1 from Route 60 to Route 5.

C. Support I64 signing for Exit 53 to indicate Williamsburg, Williamsburg Pottery and the Outlet Mall.

Thanking you for your consideration in this matter, I remain,

Sincerely,

Robert F. Brake

RFB/jbv

Box 1700 West Point, Virginia 23181 804/843-5300

Disposition:

Revised Line A which includes Line A-2 has been selected as the preferred alternative.

WILLIAMSBURG, VA.
RECEIVED
MAR 25 1986
OFFICE

March 24, 1986

Box 804
Toano, Va. 23168

Mr. Frank Hall
Virginia Department of
Highways & Transportation
P. O. Box HD
Williamsburg, Va. 23187-3608

RE: Routes under consideration for the extension of 199 through James City and York Counties

Dear Mr. Hall:

With respect to various proposed routes and designs of 199 through James City and York Counties, I urge you to recommend adoption as follows:

A. Support of Corridor A-2 through York County as presently recommended by the Virginia Department of Highways and Transportation, with 199 through York County being a limited access road, interchange only at intersection with Rt 60 and I-64, with controlled entrance/exit to Williamsburg pottery.

B. Support of Corridor A-1 through James City County.

C. Support of Re-signing I-64 for Eastbound traffic at Exit 53 to include at least the following:

1. Williamsburg Pottery, Outlet Malls - Next three exits.
2. Toano.

The westerly end of Rt 60 in James City County is an important economic base which can be preserved and stimulated by the adoption of the routes recommended above.

Please consider my recommendation as you present the options to be considered at the Corridor Hearing at Lafayette High School on April 3, 1986.

Very truly yours,

Dolores Bryant
Colonial Antique Center
TOANO

cc: William F. Brown
100 Kingsmill Road
Williamsburg, Va. 23185

Victoria Gussman
Director of Planning - James City County
P. O. Box JC
Williamsburg, Va. 23187

Disposition:

Revised Line A which includes Line A-2 has been selected as the preferred alternative.

RECEIVED

March 24, 1986

168 W. Queens Dr.
Wmsbg. Va.
23185

Mr. Frank Hall
Virginia Department of
Highways & Transportation
P. O. Box HD
Williamsburg, Va. 23187-3608

RE: Routes under consideration for the extension of 199 through James City and York Counties

Dear Mr. Hall:

With respect to various proposed routes and designs of 199 through James City and York Counties, I urge you to recommend adoption as follows:

A. Support of Corridor A-2 through York County as presently recommended by the Virginia Department of Highways and Transportation, with 199 through York County being a limited access road, interchange only at intersection with Rt 60 and I-64, with controlled entrance/exit to Williamsburg pottery.

B. Support of Corridor A-1 through James City County.

C. Support of Re-signing I-64 for Eastbound traffic at Exit 53 to include at least the following:

1. Williamsburg Pottery, Outlet Malls - Next three exits.
2. Toano.

The westerly end of Rt 60 in James City County is an important economic base which can be preserved and stimulated by the adoption of the routes recommended above.

Please consider my recommendation as you present the options to be considered at the Corridor Hearing at Lafayette High School on April 3, 1986.

Very truly yours,

Elizabeth M. Chen
— Colonial Antique Center —

cc: William F. Brown
100 Kingsmill Road
Williamsburg, Va. 23185

Victoria Gussman
Director of Planning - James City County
P. O. Box JC
Williamsburg, Va. 23187

Disposition:

Revised Line A which includes Line A-2 has been selected as the preferred alternative.

CLAYTON AGENCY

LA GRANGE FARM

RECEIVED MAR 25 1986 OFFICE

March 24, 1986

Mr. Frank Hall
Virginia Department of
Highways & Transportation
P. O. Box HD
Williamsburg, Va. 23187-3608

RE: Routes under consideration for the extension of 199 through James City and York Counties

Dear Mr. Hall:

With respect to various proposed routes and designs of 199 through James City and York Counties, I urge you to recommend adoption as follows:

A. Support of Corridor A-2 through York County as presently recommended by the Virginia Department of Highways and Transportation, with 199 through York County being a limited access road, interchange only at intersection with Rt 60 and I-64, with controlled entrance/exit to Williamsburg pottery.

B. Support of Corridor A-1 through James City County.

C. Support of Re-signing I-64 for Eastbound traffic at Exit 53 to include at least the following:

1. Williamsburg Pottery, Outlet Malls - Next three exits.
2. Toano.

The westerly end of Rt 60 in James City County is an important economic base which can be preserved and stimulated by the adoption of the routes recommended above.

Please consider my recommendation as you present the options to be considered at the Corridor Hearing at Lafayette High School on April 3, 1986.

Very truly yours,

Howard V. Clayton

HVC/mwa

cc: William F. Brown
100 Kingsmill Road
Williamsburg, Va. 23185

Victoria Gussman
Director of Planning - James City County
P. O. Box JC
Williamsburg, Va. 23187

1-804-564-8400 P.O. BOX 447 TOANO, VIRGINIA 23168

Disposition:

Revised Line A which includes Line A-2 has been selected as the preferred alternative.

P.H. File

APR 8 1986
SUFFOLK DISTRICT

To: Mr. C.A. Nash, Jr., District Engineer, Va. Dept of Hwys.

From: Donald W. Cuthrell, Jr., General Manager, WQSF-AM/FM

Subject: Proposed Route 199 Project
State Project 0199-965-101, PE100

I wish to record my opposition to the proposed Line A route of this project, as this corridor would run directly through our broadcast studios.

Unlike other businesses, the relocation of our radio studios require technical considerations above and beyond the general scope of selecting an alternative site.

We are licensed to operate our radio stations by the Federal Communications Commission within certain technical guidelines. Any alterations in our current operation would require prior approval, which is a time consuming, costly process. Not only would we be required to move physically, we would be required to select the microwave routing essential to broadcasting our signal. While our studios are impacted by this move, so is our very ability to broadcast, since the link between our studios and our transmitting facility in New Kent County is essential. Let me also make the point that such FCC approval in NOT guaranteed.

In addition to our studios and general business offices, we would be required to relocate and possibly re-license:

1. Our main microwave relay to the New Kent site.
2. Our satellite downlink for AP news.
3. Our satellite downlink for computer weather.
4. Our satellite downlink for special programming.
5. Our Marti receiving link.
6. Our transmission link to the AM tower.

At the least, this move would cost $100,000 in equipment licensing and necessary alterations. The possibility exists that we would not be able to broadcast at all, because a new site capable of meeting ours and the FCC criteria could not be located. Because of our microwave, we must be located within a certain fairly narrow corridor with relation to our transmitter.

Page 2

In summary, the Line A corridor places our facilities in a most serious situation, where simple relocation may not be possible. I don't see it in the best interests of the communities to place in jeopardy the radio stations licensed to serve them.

I therefore support Line A-1, Line A-2m or Line D.

Respectfully submitted,

Donald W. Cuthrell, Jr.
General Manager

Disposition:

The selected alignment, Revised Line A, will not result in the loss of any businesses.

H. Jackson Darst
P. O. Box 913
Williamsburg, Virginia 23187

Mr. Frank N. Hall
Virginia Dept. of Highways
P. O. Box HD
Williamsburg, Virginia 23187

Dear Mr. Hall:

This pertains to the proposed Route 199 alternatives in York County between Lightfoot I 64 interchange and Route 60. I desire that it be incorporated with the oral comments made at the public hearing on April 3, 1986.

This Committee is elected by the farmers and landowners of York County, and in the only organized voice of agriculture in the County.

Proposed Alernative D is opposed--which is the same stand taken by the supervisors of this County. In support of them alternative A 2 is endorsed.

D cuts through at least four tracts which are now used for agricultural and/or forestry--none of which have been rezoned for business. Any unecessary conversion of this land to a highway is opposed. Line A 2 will disrupt agricutlure to the least degree.

Agriculture and forestry in York County is faced with enormous pressure from development. We do not need any unnecessary augmentation of that by highway rights of way.

Sincerely,

H Jackson Darst

H Jackson Darst
Chairman, York Committee,
Agricultural Stabilization &
Conservation Service, VSDA

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APR 14 1986
OFFICE

Disposition:

Revised Line A which includes the Alignment A-2 segment has been selected.

Chesapeake

J. Carter Fox
President and
Chief Executive Officer

WILLIAMSBURG, VA.
RECEIVED
MAR 31 1986
CGRGE

March 26, 1986

Mr. Frank Hall
Virginia Department of
Highways & Transportation
P. O. Box HD
Williamsburg, Virginia 23187-3608

Dear Mr. Hall:

As a representative of a corporate property owner and tax paying entity in James City County, I feel it is critical that the correct decisions be made for the I-64-199 Connector through James City and York Counties. I therefore recommend and support the following:

1. Support of Corridor A-2 through York County as presently recommended by the Virginia Department of Highways and Transportation with said route being a limited access road with interchanges at I-64 and Route 60 with controlled ingress/egress to Williamsburg Pottery.

2. Support Corridor A-1, the easternmost route, through James City County.

3. I also support signing changes on I-64 to indicate Exit 53 as the gateway to Williamsburg, Williamsburg Pottery and the Outlet Mall.

The northern end of James City County is an important commercial area that can be enhanced by the above recommended actions.

I will be unable to attend the scheduled public hearing at Lafayette High School on April 3, 1986; but I would like my recommendations considered. Thank you for your consideration.

Sincerely,

JCF:jcg

19th & Main Streets, Box 311, West Point, Virginia 23181 804/843-5000 Telex 82-7308/7452

Disposition:

Revised Line A has been selected.

Earle W. Greene, REALTOR®
Certified Commercial - Investment Member

RECEIVED APR 7 1986

REALTOR®

April 3, 1986

Virginia Department of
Highways and Transportation
ATTN: Mr. Frank N. Hall
Resident Engineer
P.O. Box HD
Williamsburg, Virginia 23185

RE: Route 199 Extension

Dear Mr. Hall:

I am writing you regarding the proposed extension of Route 199 from U.S. Route 5 to I-64. Having been recently involved in the development of several commercial tracts, located on U.S. Route 60 between the Williamsburg Pottery entrance and Lightfoot Road, it is my opinion that the commercial development of land on the U.S. Route 60 corridor would be best served by the proposed Route 199 A-1 alignment in James City County and the A-2 alignment in York County. This design would permit easy access for the local residents to major road arteries, thus relieving the road congestion for tourist frequenting the U.S. Route 60 commercial corridor.

In the event the VDHT pursues the aforementioned alignment, I would recommend the eastbound I-64 road signage be modified to denote the two interchanges west of the proposed 199 interchange as well as the 199 interchange, as exits for the Outlet Mall and Williamsburg Pottery. This would allow the existing commercial developments on U.S. Route 60 between Toano and Lightfoot Road continued exposure to the tourist frequenting the Outlet Mall and Williamsburg Pottery which has been a major attribute in the past for the commercial development of this corridor.

Thanking you in advance for your consideration of my viewpoint, I remain,

Respectively yours

Earle W. Greene

Earle W. Greene
WMSBGRR Associates

EWG/rs

cc: E.S. Bingley, Jr.
William F. Brown

P. O. BOX 3746 • 234 E. CHURCH STREET • MARTINSVILLE, VIRGINIA 24115 • PHONE 703 - 632-6461

Disposition:

No response required.

April 3, 1986

To: State Highway and Transportation Board of Virginia:

From: Representatives of Mt. Pleasant Professional Center

We the undersigned wish to go on record as unanimously supporting the completion to Route 199. However, we are very concerned about the proposed plan to terminate Strawberry Plains Road (Route 616) as a cul- de-sac, as it would adversely affect the public health and safety and would have a significantly negative long-term effect on the area currently served by Strawberry Plains Road (Route 616).

We respectfully request that the Highway Department consider continuing Strawberry Plains Road to Route 5 for the reasons listed below and we have included a map of how this could be done.

1) There are currently five physicians and a dentist in the medical complex on Strawberry Plains Road (Route 616). There is currently easy access to emergency medical facilities. If Strawberry Plains Road becomes a cul-de-sac we believe this will create a hazard for critically ill patients as emergency vehicles will travel a more circuitous route to these patients. Time is of the essence in medical emergencies.

2) In addition to our regular patients, accident victims from Busch Gardens, Anheuser Busch, and B.A.S.F. (formerly Badische) are sent to this medical complex. All of these patients will be coming from the east side of 199. Also a large number of patients require laboratory and X-ray services and terminating Strawberry Plains Road will greatly increase the travel time for patients who are ill or injured as these services are located at the intersection of Route 5 and 199.

3) We also feel that under the current proposal there will be a significant delay in response from fire fighter vehicles. In 1982 we had a fire that resulted in $125,000 worth of damage. If there had been a slightly longer delay in response, the building could have been completely destroyed with damage of $300,000.

4) This medical complex (Mt. Pleasant Professionsl Center) is located in the largest piece of undeveloped land in the City of Williamsburg. The College of William & Mary currently own this land and has recently sold some of its other property and could possibly sell some or all of the adjacent land at a later time. Continuing Strawberry Plains Road to Route 5 will provide access to this property.

We are in agreement with the position of the City of Williamsburg and James City County that Strawberry Plains Road (Route 616) can and should be continued as a thoroughfare when the proposed extension of Route 199 is started.

Clifford E. Henderson, M.D.

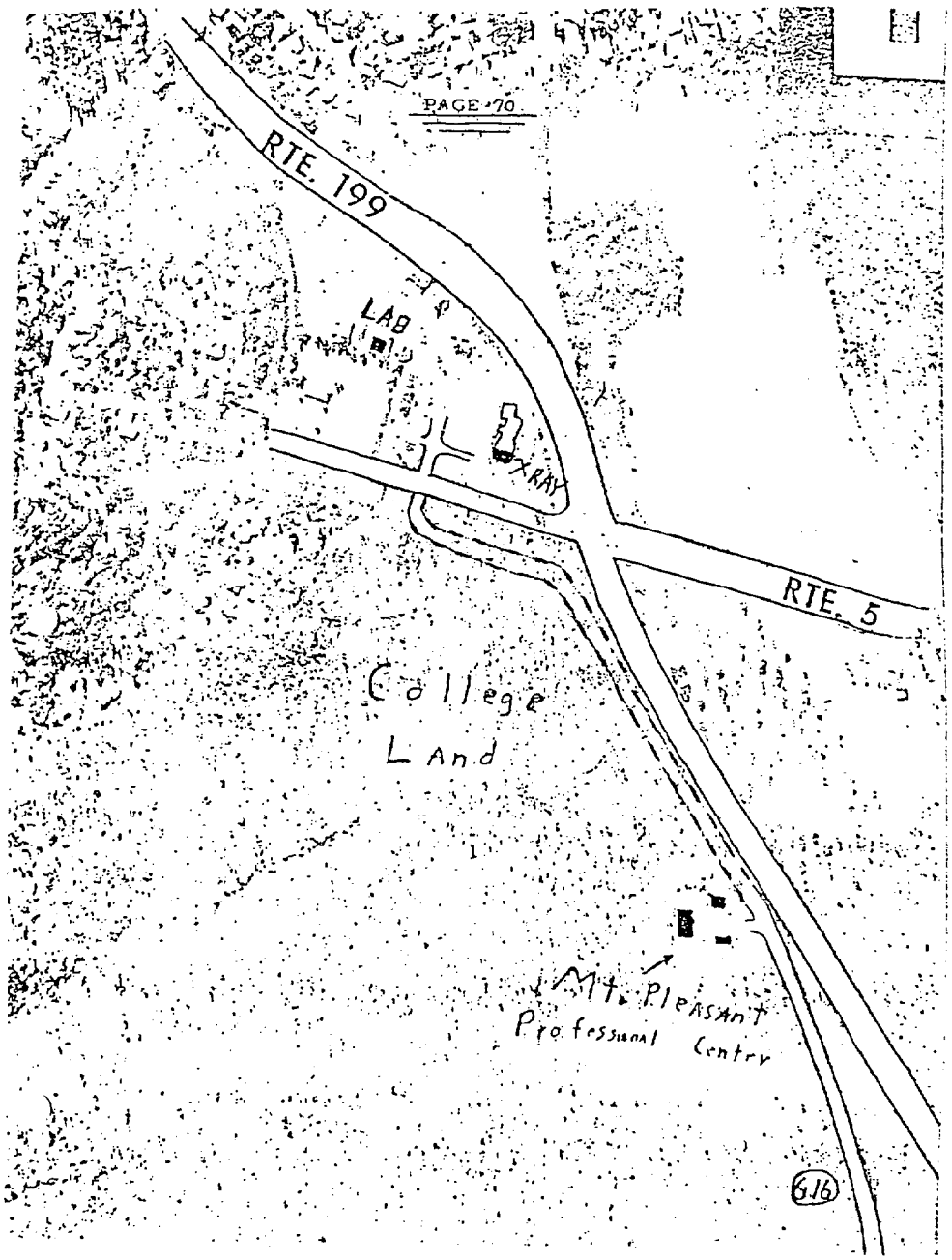
Thomas J. Powers, Jr., M.D.

Richard B. Theis, M.D.

Scott Y. Pharr, M.D.

Anthony J. Taylor, M.D.

Peter D. Wendell, D.D.S.



Disposition:

Through access for Strawberry Plains Road (Route 616) has been provided.

SUFFOLK DIS

210 Thomas Nelson Lane
Williamsburg, Virginia 23185
April 10, 1986

Mr. C. A. Nash, Jr.
District Engineer
Virginia Department of Highways
and Transportation
Post Office Box 1070
Suffolk, Virginia 23434

Dear Mr. Nash:

We, as property owners on Route 646, favor the improvement of Route 646 and oppose the extension of Route 199 into our area.

Sincerely yours,

Aspen P. Lee

Blanche B. Lee

Disposition:

No response required.

McGuire, Woods & Battle
137 York Street
P. O. Box 379
Williamsburg, Virginia 23187
Telephone (804) 229-2393

One James Center
Richmond, Virginia 23219
Cable McWoBat
Telex 82-7414
Telephone (804) 644-4131

Court Square Building
Charlottesville, Virginia 22901
Telephone (804) 977-2500

Sovran Center
Norfolk, Virginia 23510
Telephone (804) 627-7677

Jefferson Court
Washington, D. C. 20007
Telephone (202) 337-1337

April 9, 1986

RECEIVED
APR 10 1986
SUFFOLK DISTRICT

Mr. C. A. Nash, Jr.
District Engineer
Virginia Department of Highways
and Transportation
Post Office Box 1070
Suffolk, Virginia 23434

Re: Route 199 - James City County
Ford's Colony at Williamsburg, Inc.

Dear Mr. Nash:

I write on behalf of Ford's Colony at Williamsburg, Inc. to reiterate and amplify the remarks which I made orally at the hearing which you conducted on April 3, 1986, at Lafayette High School.

In reliance on the James City County Land Use Plan and the decision made by the Virginia Department of Highways in 1979, to adopt Line A as the corridor for the unfinished portion of Route 199 through James City County, Ford's Colony at Williamsburg, Inc. has invested millions of dollars in the acquisition and development of two tracts of land known locally as Ford's Colony (1,410 acres) and Williamsburg West (700 acres).

Ford's Colony has approval for the development on the Ford's Colony tract of 1150 single-family residences and 826 multi-family residences, and also plans a resort hotel, a golf country club, a private wellness center, a property owners' community club, three golf courses and related maintenance and sales centers. One of the three golf courses is planned for nine holes on the Ford's Colony tract and a connected nine holes on the Williamsburg West tract. The Williamsburg West tract is separated from Ford's Colony by Longhill Swamp, a marshy area within the 100 year floodplain. Your proposed Line D for the Route 199 corridor traverses Longhill Swamp from north to south, separating the Ford's Colony property from the adjoining Williamsburg West property.

Ford's Colony wishes to register the strongest possible protest to this alignment of Route 199. It has made its investments and will make its future investments in reliance on

Mr. C. A. Nash, Jr.
April 9, 1986
Page 2

your prior approval of Corridor A. Corridor D will have a devastating effect on the present and future development of the two tracts of land owned by Ford's Colony at Williamsburg, Inc., will degrade the environment in Longhill Swamp and will seriously effect the value of the residential lots and amenities now being developed and proposed for the two tracts of land described above.

Ford's Colony at Williamsburg, Inc. is also concerned about proposed Line A-1, although it realizes that some alteration in Line A is required to avoid environmental damage to an endangered species of plant. Nevertheless, Ford's Colony at Williamsburg, Inc. urges that Line A-1 be realigned to run just west of the 100' contour marking a north-south ridge on the west side of the Soft 96 radio tower. This would avoid the large sweeping curve of Line A-1 shown on your schematic drawings. The line shown on your drawings would sever a large parcel of land from the southeast corner of the Williamsburg West property. This land would have no access to either Route 199 or to any other public road and would be unusable by the owners. Other testimony at your April 3 hearing indicates that this line can be adjusted without environmental danger to the endangered species which you seek to protect.

For the foregoing reasons, Ford's Colony at Williamsburg, Inc. will use every means at its disposal to object to and defeat the alignment of Route 199 along proposed Line D and the proposed Line A-1, unless the latter can be adjusted to avoid damage to its property.

I appreciated the opportunity to speak at your public hearing and I trust that the position of my clients, which is in line with that adopted by the James City County Board of Supervisors, will convince the Virginia Department of Highways to adopt Line A and a less damaging alignment of Line A-1 through James City County as the corridor for this new road.

Very truly yours,

V. M. Geddy, Jr.

V. M. Geddy, Jr.

VMG/jls

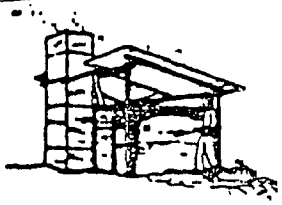
Disposition:

Revised Line A has been selected.

P.H. File

HAND-CARVED COBALT
SALT GLAZE
CIRCA-1750

WILLIAMSBURG POTTERY FACTORY, INC.
Lightfoot, Virginia 23090
5 MILES WEST OF WILLIAMSBURG, ROUTE 60
804-564-3326
TELEX 823459
CABLE ADDRESS POTSHOP



SALTING THE KILN

JAMES E. MALONEY
Chairman of Board
GLORIA F. MALONEY
Vice-Chairman of Board
FREDERICK C. MALONEY
President
CHARLES F. CRONE
Vice President
KENNETH F. JOHNSON
Vice President
JOAN M. JOHNSON
Vice President
ALICE M. HAWKINS
Vice President

April 16, 1986

Mr. C. A. Nash, Jr.
District Engineer
Virginia Department of Highways
and Transportation
P.O. Box 1070
Suffolk, VA 23434

RE: Proposed Route 199, York County

Dear Mr. Nash:

The Williamsburg Pottery Factory, Inc. (i.e., The Pottery) is very appreciative of the fact that the Department expanded its environmental study of Route 199 locational alternatives to include Alignment A-2 in the Route 646 corridor. That was clearly indicative of the Department's commitment to cooperative State transportation and private industry planning. The Pottery hereby reaffirms its support of Alignment A-2 and respectfully urges State Highway and Transportation Board adoption of the same.

The Pottery submits that the Department's Draft Environmental Impact Statement clearly presents Alignment A-2 as not just a viable alternative but in fact the best alternative for the Route 646 corridor. Following are some specific comments relative to this conclusion.

Alignment A - York County

Alignment A would virtually destroy a large section of Route 646, a road believed to have both historic and sentimental value to that area of York County. Similarly, Alignment A would cause a relatively large tract of land owned and held by The Pottery for future commercial development to be basically unsuitable for such development. Furthermore, Alignment A is more costly, more disruptive, and would be much less effective in providing for coordinated transportation and land use planning as envisioned by York County's plans, goals and objectives for that area.

Alignment D - York County

Within the context of York County's planning and economic development goals, Alignment D would be of little value. Yes, it would place the new highway further from a few existing housing units. However, the Route 646 corridor is a

(1) ** Plan Sheet attached to this correspondence forwarded to Central Office with transcript.

Attachment No. 4

land-in-transition. Largely attributable to York County's planning and zoning changes in that corridor, the transition from residential to commercial land use has already begun, clearly evidenced by both recent land sales and properties currently being advertised for sale. Alignment D would do little to preserve the already enhanced property values along Route 646 and, consequently, would not be in the best interest of existing property owners. Implementation of Alignment D would require either immediate or concurrent investment of significant additional state resources in the upgrading of Route 646, an investment deemed neither necessary nor prudent in view of the attributes of alternative Alignment A-2.

Alignment A-2

Alignment A-2 offers the Department an excellent opportunity to be a key participant in cooperative governmental (state and local) and private industry land use/transportation/economic development planning. The York County Board of Supervisors has unanimously endorsed Alignment A-2 as being in the County's best interests. The Pottery supports Alignment A-2 as being the only alternative that will effectively meet its access needs for both existing Pottery operations and the development of other owned properties in the Route 646 corridor. These latter properties are both adjacent to and removed from existing Pottery operations. The Pottery reemphasized its belief that Alignment A-2 is also in the best interest of virtually all property owners in the Route 646 corridor, and that it offers the best opportunity for providing transportation facilities supportive of corridor development. Implementation of Alignment A-2 should preclude the need for significant investment in upgrading Route 646, at least for some time in the future. With corridor access provided as currently planned, with an intersection placed approximately mid-corridor, Alignment A-2 should provide access necessary for ultimate full corridor development.

Pottery Operations & Development Plans

The Pottery is one of several primary tourist attractions in the Williamsburg area, conceivably the destination for more annual vehicular trips than any other single destination in the area. The Pottery is naturally interested in seeing that access for its visitors/patrons is afforded in the most convenient fashion, which is logically the most direct route. Accordingly, The Pottery has for some time been pursuing planning alternatives that would facilitate the reorientation of its main entrance to the Route 646 corridor, contingent upon improved access from Interstate 64. The alignment A-2 alternative for Route 199 is the only alternative studied which will provide for accomplishment of that objective. Furthermore, Alignment A-2 will effectively support The Pottery's plans for development of other properties in the Route 646 corridor, initiatives the Pottery believes will provide the stimulus needed for the ultimate well planned development of the entire corridor.

Enclosed herewith is a copy of The Pottery's current development plan. Please note that this current plan has been coordinated effectively with Alignment A-2, You will also note that development priorities are slightly different from an earlier plan rendering shared with Department personnel. Given Alignment A-2, The Pottery believes it will be in its best interest, as well as the interest of overall corridor land use and transportation development, to phase new development with initial activity planned around the new entrance to existing Pottery

operations. Future development activity will consequently proceed up and down Route 646 as sound planning and economic conditions dictate. As noted earlier, such development phasing should preclude the need for significant financial investments in improving Route 646 for some time in the future.

The Pottery appreciates the opportunity to submit these comments for the Department and Board's consideration. Finally, the Pottery pledges its commitment to this opportunity for cooperative governmental - private industry pursuit of what appear to be mutually supportive, as well as compatible transportation/land use/economic development planning goals and objectives.

Respectfully submitted,

THE WILLIAMSBURG POTTERY FACTORY, INC.

Frederick C. Maloney

Frederick C. Maloney
President

cc: Mr. H. M. Shaver, Jr.

Disposition:

Revised Line A which uses the Alignment A-2 segment has been selected.

PH File

5087 Longhill Road
Williamsburg, Virginia
April 7, 1986

Mr. C. A. Nash
P.O.Box 1070
Suffolk, Virginia 23434

Dear Mr. Nash:

I am a life-long resident of 5087 Longhill Road, in James City County, and would like to voice my opinion in regards to the Rt. 199 extension.

I attended the meeting at Lafayette High School on April 4th and was amazed to find that the majority of the people there felt the same as I do. It was obvious that the residents of James City County were opposed to Rt. 199 Corridor Line D. I heard several reasons why this route would not be fair to the residents that this proposed route effects, as well as to the tax payers of James City County. These reasons included cost, environment, etc. I felt that Line A, or A1, seemed to satisfy almost all of the James City County residents.

I also listened to several York County residents speak and the majority of them spoke in favor of Corridor Line D & A in York County. I heard of several residences and businesses that would be destroyed because of these proposals for Rt. 199.

It was obvious to me that there is a solution to both residents of James City and York counties. I feel that Rt. 199 Corridor Line A, or A1, could be followed through James City County, and where line D meets with A in York County follow either of these through York County. I feel that you will make the same decision that the majority of James City and York County residents have already made.

Sincerely,

Steve E. Minor
Janet J. Minor

SEM:wsm

APR 8 1986

SUFFOLK DISTRICT

Disposition:

No response required.

FORD'S COLONY WILLIAMSBURG

April 4, 1986

APR 1986 RECEIVED PLANNING DEPARTMENT

Forwarded to CA Wash. Jr. By Director of Planning - James City Co. 4-11-86.

Director of Planning
James City County
P. O. Box JC
Williamsburg, VA 23185

Dear Ms. Gussman:

In cooperation with the Biology Department at the College of William and Mary and the Location and Design (LOC) Engineers of the Virginia Department of Highway and Transportation (VDH&T), Ford's Colony has studied the proposed routings of RT 199 in James City County. Ford's Colony is strongly opposed to proposal D and is making a formal presentation to VDH&T in Richmond through our legal representatives, McQuire, Woods & Battle. The purpose of this letter is to point out a variation to proposal A-1 which we endorse with the support of environmental concerns about the Isotria medeoloides (small whorled pogonia) and the LOC Division of VDH&T.

When the James City County corridor of 199 was being designed in 1976, the LOC Division of VDH&T designed an alternate to proposal A as we now know it by routing immediately West of the "Soft 96" radio tower field and on the Westerly side of the 100 ft. ridge line North to where A-1 and A now intersect. I will call this route "alternate A" for the sake of clarity. Alternate A was abandon for A in 1976 and never got out of the LOC Division because it apparently offered no advantages over A. The only disadvantage known was a slight cost increase to swing West of the radio tower. VDH&T offered proposal A and D for public consideration.

Alternate A-1 surfaced in response to Mrs. Donna Ware's rediscovery of the small whorled pogonia in 1982 in the vicinity of the intended route of proposal A approximately one mile due North of the radio tower. With the subsequent classification of the orchid to the Endangered Plant and Insect Species of Virginia in 1985, VDH&T determined it would be appropriate to route proposal A on the other side of the ridge line to prevent alteration of the drainage area and habitat of the orchid. With the interchange for proposal D already designed North-West of Mt. Pleasant Church, the LOC Division simply swung a Northerly arc to intersect with proposal A on Eastern State property. The LOC Division has informed me that it is a simple matter of redesigning the interchange ramps

Ford's Colony at Williamsburg
One Ford's Colony Drive
Williamsburg, Virginia 23185
1-800-334-6033 1-800-533-4043 (in VA)

to accommodate Ford's Colony's request to revive alternate A. In fact, the LOC Division informed me that, if they were aware of our concerns earlier, proposal A-1 could have been the original alternate A since alternate A minimizes the impact on Ford's Colony, Casey, and Eastern State property.

Enclosure 1 graphically illustrates alternate A in comparision with proposal A, A-1, and D. Ford's Colony requests that the Planning Department, Planning Commission and Board of Supervisors endorse this modification to proposal A. Proposal A-1 sweeps unnecessarily West of the intended route. Additionally, alternate A would represent a savings of approximately 2000 linear feet of roadway compared to A-1.

Sincerely,

Drew R. Mulhare
Project Engineer

Disposition:

Revised Line A has been selected. The selected alignment does not extend as far westward as the Alignment A-1.

OTEY AND POWELL
ATTORNEYS AT LAW
POST OFFICE BOX 192
WILLIAMSBURG, VIRGINIA 23187

DAVID W. OTEY
SAMUEL T. POWELL
DAVID W. OTEY, JR.

1614 JOHN JEFFERSON RD.
TELEPHONE (804) 229-6141

April 17, 1986

Mr. M. H. Culbertson, Jr.
District Right of Way Manager
Department of Highways & Transportation
1221 East Broad Street
Richmond, VA 23219

RE: Route 199, Project 0199-965-101, PE-100
Property of Ronald T. Curtis Custom Builder, Inc.

Dear Mr. Culbertson:

This firm represents Ronald T. Curtis Custom Builder, Inc., and I have in hand your letter to Mr. Curtis dated April 11, 1986. I understand that there has recently been some public comment favoring so-called Alternative A-1 to proposed Route 199. It is my understanding that Line A-1 is an alternative recently proposed as a way of avoiding certain environmental objections.

As you might expect, on behalf of my client, I vigorously oppose Alternatives A-1 and D or any variation thereof that would bisect my clients 37 acres.

Mr. Curtis' company purchased this property several years ago intending to subdivide it into high quality wooded lots. As you will note, the property is and has been zoned R-2. At the time Mr. Curtis purchased the property, water and sewer were available without any need for the construction of a pumping station. Although Route 199 had been proposed, no then existing alternatives interfered with Mr. Curtis' intended development. Relying on all of the foregoing, Mr. Curtis purchased the property.

Mr. Curtis has begun work on his intended 100-120 lot subdivision. Alternatives A-1 and D would bisect his subdivision and render his plans completely useless. Certainly there are more desirable alternative routes that would avoid such significant interference with projects consistent with both current zoning and James City County's comprehensive plan.

Thank you for your consideration.

Yours very truly,

David W. Otey, Jr.

RECEIVED
APR 18 1986

DWO:jmg
cc: William F. Brown

Disposition:

Revised Line A has been selected.

7828 Richmond Rd.
Toano, Va. 23168

March 24, 1986

Mr. Frank Hall
Virginia Department of
Highways & Transportation
P. O. Box HD
Williamsburg, Va. 23187-3608

RE: Routes under consideration for the extension of 199 through James City and York Counties

Dear Mr. Hall:

With respect to various proposed routes and designs of 199 through James City and York Counties, I urge you to recommend adoption as follows:

A. Support of Corridor A-2 through York County as presently recommended by the Virginia Department of Highways and Transportation, with 199 through York County being a limited access road, interchange only at intersection with Rt 60 and I-64, with controlled entrance/exit to Williamsburg pottery.

B. Support of Corridor A-1 through James City County.

C. Support of Re-signing I-64 for Eastbound traffic at Exit 53 to include at least the following:

1. Williamsburg Pottery, Outlet Malls - Next three exits.
2. Toano.

The westerly end of Rt 60 in James City County is an important economic base which can be preserved and stimulated by the adoption of the routes recommended above.

Please consider my recommendation as you present the options to be considered at the Corridor Hearing at Lafayette High School on April 3, 1986.

Very truly yours,

cc: William F. Brown
100 Kingsmill Road
Williamsburg, Va. 23185

Victoria Gussman
Director of Planning - James City County
P. O. Box JC
Williamsburg, Va. 23187

Disposition:

No response required.

P.H. File

APR 7 1986
SUFFOLK DISTRICT

William M. Pettitt, Jr.
34 Patton Drive
Newport News, Virginia 23606

Commonwealth of Virginia
Dept. Of Highways & Transportation
Suffolk , Virginia 23434

Dear Sirs:

1. I own the last piece of property on the north side of 646 next to the C&O railroad in York County. I am very concerned about the new Route # 199 that is being proposed for that area. From what I heard at the public hearing last night, it seemed to me that almost everyone from York County that spoke, had a similar view. "Leave 646 alone to develope into the CT (Commercial Tourist) area that the York County planning board seems to have projected". Mr. Robert Ripley made a very good presentation for the investors that have bought property along 646 based on past and present planning and I can understand their position. As a long time property owner (My family has owned this land since the early 1800's) I am very concerned that this new road will seal off my property and leave me with high taxes and on a dead end lane, watching the cars go to the Pottery and not able to develope or utilize the land as it should. From what was said at the meeting it seems that the Pottery has an unfair advantage over your road building plans.

2. Mr. Gallimore and others stated that "If the York County part of the road must be changed at all, it should be the line D with at least a direct road to #646 from the interchange at the intersection of #646 and #64. I tried to talk to as many of the #646 property owners as possible, and all that I talked to said:

(1) Leave 646 alone.
(2) At least build #199 along line "D" and leave us a clear road from Route #646.

3. As a small property owner I fell that our interests are not always given as much weight as a big outfit such as the Pottery. I hope my faith in the system is justified and your road will benefit the community not just the one big special interest group.

4. I do not have any thoughts at all on the projected route through James City County as I am not effected and have therefore not studied its route.

5. I sincerely hope that you can build a road that will not destroy the potential of Route #646 from Route #64 to Route #60.

Sincerely

William M. Pettitt, Jr.

William M. Pettitt, Jr.

Disposition:

Access has been provided between Routes 199 and 646.

127 Lightfoot Road
Williamsburg, Va.
23185
12 April, 1986

Mr. Frank Hall, Resident Engineer
Department of Highways and Transportation
Williamsburg, Virginia

Dear Mr. Hall:

It is the purpose of this letter to join with most of the other residents along Lightfoot Road to express our determined opposition to any plans within your department to select any corridor other than the so-called LINE D for the route for the proposed Route 199 extension from I_64 to U. S. 60.

We view the "A" Lines, 1 & 2, as too destructive of homes, community, valuable resource property to justify the punishment of so many for the benefit of so few. Our overwhelming feeling is that we would rather see Route 199 plans abandoned than have the heart of our community gutted by a massive road bed. I feel that the regional study people used too broad a brush in delineating a proposed route, and did not take into account the vicious impact upon local residents.

Thank your for letting me file this view.

Sincerely yours,

George H. Pope

George H. Pope

APR 14 1986

Disposition:

No response required.

LADY ANNE
DOLLS INC
RT 60 P.O. BOX 245
NORGE VA 23127
804-564-9703

Williamsburg Doll Factory
HOME OF
Lady Anne Dolls

WILLIAMSBURG
DOLL FACTORY
RT 60 P.O. BOX 291
NORGE VA 23127
804-564-9703

March 28, 1986

Mr. Frank Hall
Virginia Department of
Highways & Transportation
P. O. Box HD
Williamsburg, VA 23187

RE: Routes under consideration of 199 through James City and York Counties..

Dear Mr. Hall:

With respect to various proposed routes and designs of 199 through James City and York Counties, I urge you to recommend adoption as follows:

A. Support of Corridor A-2 through York County as presently recommended by the Virginia Department of Highways and Transportation, with 199 through York County being a limited access road, interchange only at intersection with Rt. 60 and I-64, with controlled entrance/exit to Williamsburg Pottery.

B. Support of Corridor A-1 through James City County.

C. Support of Re-signing I-64 for Eastbound traffic at Exit 53 to include as least the following:

1. Williamsburg Pottery, Outlets Malls - Next three exits.
2. Toano.

The westerly end of Rt. 60 in James City County is an important economic base which can be preserved and stimulated by the adoption of the routes recommended above.

Please consider my recommendations as you present the options to be considered at the Corridor Hearing at Lafayette High School on April 3, 1986.

RECEIVED
MAR 31 1986
OFFICE

Very truly yours,
Margaret Rothwell

WHEN IN WILLIAMSBURG VISIT OUR DOLL FACTORY.

Disposition:

No response required.

PH File

APR 1 3
SUFFOLK DISTRICT

101 Lightfoot Road
Williamsburg, Virginia
April 15, 1986

Mr. C. A. Nash, Jr.
District Engineer
Virginia Department of Highways and Transportation
P. O. Box 1070
Suffolk, Virginia

Dear Sir:

Regarding Route 199, Project 0199-965-101,PE 100

I have been a long term resident of York County, living on Lightfoot Road (646) at the I-64 end, for 35 Years. I was here when route 168 was upgraded to a double lane highway,,and am one of about 3 original families living on this road now. I have seen a lot of changes made in this community in that time, from a farming area to a residential community with a few farms left.

It was changed quite a lot when I-64, and Rochambeau roads were built in 1977. At that time these highways divided and used up a lot of frontage on my place. So I am very disturbed with this 199 project coming up again now.

As I see it along with most of my neighbors that Lightfoot Road (646) is all the road this community needs from I-64 to route 60. This road (646) in an upgraded condition of being a 4 lane highway with a turning lane in the center is all we need.

I,along with most of the people of this community do not want a limited access highway like 199 coming through our property.

Of the three alignment alternatives presented at the location meeting, corridor A-2 will do me less damage. The board of supervisors of York County has already selected this alignment with modifications at the I-64 end. The modifications being that line A-2 will cross to the north of 646 about a ¼ mile. from the I64 interchange, with Rochambeau to be kept as close to I-64 as like it is now.

This road,route 199 has been kicked around in the highway department since 1979 and has been very disturbing to me and my family ever since.

Sincerely yours,

Robert F. Sherman

Robert F. Sherman
ph. 565-2030

Disposition:

Revised Line A which includes the Alignment A-2 segment has been selected.

ROBERT BROWN & ASSOC. INC.

March 27, 1986

Virginia Department of Highways and Transportation
ATTN: Mr. Frank N. Hall
Resident Engineer
P.O. Box HO
Williamsburg, Virginia 23185

RE: Route 199 Extension

Dear Mr. Hall:

I am writing you regarding the proposed extension of Route 199 from U.S. Route 5 to I-64. Having been recently involved in the develcoment of several commercial tracts, located on U.S. Route 60 between the Williamsburg Pottery entrance and Lightfoot Road, it is my opinion that the commercial development of land on the U.S. Route 60 corridor would be best served by the proposed Route 199 A-1 alignment in James City County and the A-2 alignment in York County. This design would permit easy access for the local residents to major road arteries thus relieving the road congestion for tourist frequenting the U.S. Route 60 commercial corridor.

In the event the VDHT pursues the aforementioned alignment, I would recommend the eastbound I-64 road signage be modified to denote the two interchanges west of the proposed 199 interchange as well as the 199 interchange, as exits for the Outlet Mall and Williamsburg Pottery. This would allow the existing commercial developments on U.S. Route 60 between Toano and Lightfoot Road continued exposure to the tourist frequenting the Outlet Mall and the Williamsburg Pottery which has been a major attribute in the past for the comercial development of this corridor.

Thanking you in advance for your consideration of my viewpoint, I remain,

Respectively yours,

Robert J. Singley

RJS/klm

cc: E.S. Bingley, Jr.
William F. Brown

Commercial Real Estate • Brokerage • Development
3 Koger Executive Center, Suite 100 • P.O. Box 12702 • Norfolk, Virginia 23502 • Norfolk (804) 461-0000 • Peninsula (804) 877-5600

Disposition:

No response required.

VIRGINIA LANDMARK CORPORATION
Realtors

P.O. Box 8379 • 1807 Libbie Avenue • Richmond, Virginia 23226 • (804) 285-3935

April 4, 1986

APR 7 1986
SUFFOLK DISTRICT

Mr. C. A. Nash, Jr.
District Engineer
Virginia Department of Highways
and Transportation
P. O. Box 1070
Suffolk, VA 23434

Dear Mr. Nash:

I was at the Location Public Hearing for Route 199 at the LaFayette High School in James City County on April 3 and am writing a letter as a representative for the Casey family, which owns a significant amount of property between Route 615 and Eastern State Hospital, that would be effected by Route 199. We ask that this letter be incorporated as part of the official record of that Hearing.

At the present time, with the information available to the Caseys, it appears that Route A-1 is the most appropriate for them.

The actual routing cost needs to be subject to certain micro studies, and to this end, we are requesting some information from you in order to more specifically pin down the more appropriate location and to identify potential problem areas.

To this end, Have you applied the proposed A-1 route to a property line section sheet of James City County? Have you all flown aerial topography? Environmental Impact Study indicates several archaeological sites located on the Casey properties. This was from Map 4.7, located just after Page 432 in the Environmental Impact Study Book. Are there any written descriptions concerning what these archaeological sites consist of? As you are aware, there is an endangered specie plant (a pogonia). Has any mapping been done to locate the extremities of this plant? ① ② ③ ④

Finally, is the Monticello extension from Route 615 to the proposed 199 part of this project? ⑤

If we could have the aforementioned information and data, the Caseys would be in a position to definitively arrive at some conclusions about the location.

With appreciation for a prompt response, I remain,

Cordially,

Joseph Stettinius (KC)

Joseph Stettinius

JS/kc
cc: Mr. C. Lewis Casey
The Reverend Carlton D. Casey
The Reverend Robert T. Casey

Disposition:

1. Property lines have not been assessed as part of the DEIS.
2. Aerial photography is available for the Route 199 Study Corridor and was used in the development of the various alternatives.
3. The Cultural Resources Technical Report provides a detailed description of the archaeological sites.
4. A Section 7 - Biological Assessment has been conducted for the endangered plant species (Isotria medeoloides).
5. Monticello Avenue extension from Route 615 will be constructed; however, it is not part of this project.

PH. File

ARCHITECTURE ENGINEERING SURVEYING PLANNING

a professional corporation

Paul C. Small, PE, PLS
Richard A. Costello, PE

April 11, 1986

RECEIVED
APR 15 1995
SUFFOLK DISTRICT

Mr. C. A. Nash, Jr.
District Engineer
Virginia Department of Highways
and Transportation
P. O. Box 1070
Suffolk, Virginia 23434

RE: Route 199 Extension from Rte. 5 to I-64
State Project No. 0199-965-101, PE101

Dear Mr. Nash:

Please enter the following comments into the public hearing record (held April 3, 1986) for the above referenced project. Be advised that our firm is and has been involved with the location and design of numerous land development and utility projects all along the proposed corridor of Route 199 extended. Representative projects and clients of AES, include: Ford's Colony (Richard Ford), Windsor Forest (Robert S. Hornsby), Seasons Trace (David Hertzler), Outlets Ltd. Mall, The Midlands Townhouses (Joseph Terrell), New Quarter Industrial Park, Olde Towne Square, Chisel Run, Williamsburg West (now part of Ford's Colony),the Williamsburg Pottery and both political jurisdictions.

We have followed the progress of Route 199 since its inception. We have attended both public hearings, and we have worked closely with James City County in their efforts to preserve and protect the proposed corridor. As a result, we feel that we are thoroughly familiar with the various alternatives for the final alignment of Route 199.

Based on our evaluations of the alternatives, and given our knowledge of the design constraints within the corridor, we support a modification of alternative "A" in James City County. We cannot support line "A2" in James City County due to cost, and we cannot support line "D" in James City County for reasons of both cost and adverse environmental impact. We feel that a minor modification to the proposed alignment of line "A" in James City County could be made on a final design basis such that the "small whorled pagonia" colony could be preserved. This would eliminate the impact on this environmentally sensitive area and at the same time preserve the cost effectiveness of line "A" as compared with the other alternatives. Selection of line "A" with this modification would also salvage the considerable effort James City County has expended over the past ten years in implementing land use controls through their zoning and review process to protect, preserve and actually acquire right-of-way for the line "A" corridor.

1761 Jamestown Road, Williamsburg, Va. 23185 804-253-0040

We support line A2 in York County from Route 60 Northwest to I-64 because it simply represents in our opinion the best alignment for the future of both political jurisdiction and the land owners affected. We also support business signage at the Croaker/Norge interchange and at the Barhamsville/Toano interchange that would provide directional information to eastbound traffic from Richmond relating to major businesses along the Route 60 corridor from Lightfoot north to Barhamsville. Such signage would offset any adverse economic impact to commercial interests in James City County resulting from single point signage at the Lightfoot interchange.

We would appreciate your consideration of our comments and wish to compliment you on your excellent presentation at the recent public hearing. Perhaps with joint cooperation of all involved parties, we may yet see the completion of 199 in the near future.

Respectfully submitted,

AES, a professional corporation

Paul C. Small

Paul C. Small, P.E.
President

PCS:dpp

cc: Frank Hall, VDH&T

Disposition:

Revised Line A has been selected. This alignment includes the Alignment A-2 segment.

Charles City - James City - New Kent Farm Bureau, Inc.

P. O. BOX 97
Providence Forge, Virginia
April 4, 1986

Mr. F. W. Hall
Virginia Department of Highways and Transportation
P. O. Box HD
Williamsburg, Virginia 23187

Dear Mr. Hall,

This letter is in reference to the public hearing on proposed Route 199 between the Lightfoot interchange and and Route 60 in York County.

We concur with the York supervisors and Williamsburg Council in recommending alternative A-2.

As farmers we are vitally concerned with area water resources. Millions of dollars are being spent on the Chesapeake Bay clean-up, a good portion of which is going to agriculture, consequently, it is our opinion that it would be counter-productive to select a highway alternative (D) which in both building and in traffic will inevitably pollute the York river and bay. Alternative D crosses erodable, sloping ground, springs, ravines and streams which feed the Waller Mill Reservoir. A-2 is high, level and much more desirable from a water resource management point of view.

Sincerely,

Albert L. White, IV

Albert L. White, IV
Legislative Director

ALW/gb

WILLIAMSBURG, VA.
RECEIVED
APR 7 1986
OFFICE

Disposition:

No response required.

7.0 LIST OF PREPARERS

Virginia Department of Transportation

Name and Degree	Expertise Applied to EIS	Experience
Vincent Valenti	EIS Coordination and Review	Eight years experience in transportation noise analysis and 7 years in environmental planning.

Federal Highway Administration

Robert Thomas, BSCE, MBA	Project Coordination and Review	10 years experience in highway engineering.
George E. Kirk, BSCE	Project Coordination and Review	27 years experience in highway engineering.

De Leuw, Cather and Company

Lidano A. Boccia, MA	Overall Consultant Project Coordinator/Task Manager socioeconomic impacts	Eleven years experience in socioeconomic, land use and environmental analyses for municipal, environmental and transportation projects.

Harland Bartholomew & Associates, Inc.

Mary M. Howard, MA	Document coordination, field investigation for cultural resources analysis assessment	Thirteen years experience in environmental planning and cultural resources.
Elaine D. O'Flaherty, MURP	Assistant Document Coordinator, data collection and development of socioeconomic analysis	Four years experience in regional and local land use planning, market analyses and development of regional policies plan.
Janit L. Potter, MLA	Project Coordination, Administrative Assistance to the Project Manager. Coordination and research for architectural resources analysis	Four years experience in land use planning, site development and environmental planning.
M. Janet Everett, MSCE	Task Manager for transportation systems analysis and energy analysis	Nine years of experience in traffic engineering and transportation planning.
Timothy L. Guyton, BSCE	Transportation Systems Analysis	2 years experience in traffic engineering and transportation planning.

Diaz, Seckinger & Associates

George Brisban, BSCE	Task Manager, future systems and Route 199 traffic, noise impacts	Twenty years of experience in transportation engineering and planning.
Steve Henry, BSCE	Existing traffic conditions	One year experience in traffic engineering and transportation planning.
Randy Cohen, BA	Existing traffic conditions	Fourteen years experience in traffic engineering and transportation planning.

Engineering-Science, Inc.

Richard E. Burke, MS	Task Manager, noise impacts	Eleven years experience in environmental assessment and noise impacts.
Krishna Nand, Ph.D.	Noise analysis and report preparation	Experience in environmental assessment and noise analysis.
Kendall Jue, MS	Noise analysis and report preparation	One year experience in noise analysis.

Environmental Science and Engineering, Inc.

Ron Alderfer, Ph.D.	Task Manager, water quality and ecology	Sixteen years experience in the area of environmental impact assessment, toxic and hazardous material and bio-physical ecology.
Richard Hall, MS	Water quality and ecology	Ten years of experience in aquatic ecology and limnology.
William Elzinga, MS	Water quality and ecology	Three years of experience in aquatic and terrestrial ecology.

Office of Excavation and Conservation, Department of Archaeology

Marley R. Brown, III, MA	Task Manager, Archaeological resources	Seventeen years experience in archaeology and anthropology.
Robert P. Hunter	Archaeological resources	Ten years experience conducting archaeological research on prehistoric and historic sites in Virginia.

Thomas Higgins, III, MA	Research and field survey for archaeological analysis	Supervised several major excavation projects for the Colonial Williamsburg Foundation.
Reynolds, Smith & Hills, Inc.		
Walter A. W. Jetter, MS	Task Manager, air quality analysis	Eleven years experience in environmental analysis and planning. Nine years experience in air quality analysis and environmental document preparation.
Daniel Doebler, BS	Air quality analysis	Six years experience in environmental analysis. Expertise in microscale and mesoscale air quality analysis.
Wendy J. Giesy, MS	Draft EIS preparation	Nine years experience in environmental analysis and planning. Seven years experience in environmental document preparation.
WAPORA, Inc.		
Steven Bach, Ph.D	Responsible for managing the WAPORA, Inc. wetlands evaluation team.	Thirteen years of experience performing ecological and botanical studies specializing in submerged and emergent vegetation.
Steve Bowling	Coordination of wetlands data.	Fifteen years experience in conducting botanical surveys for wetlands terrestrial vegetation for various agencies.
Jim Renner, MS	Digitized wetland maps and review of the DEIS.	Two years experience in preparing technical studies for environmental projects.
David Dummond, MS	Delineated wetlands using Corps of Engineers multiparameters approach.	20 years experience as a wetland botanists, soil scientist and general ecologist serving as a consultant to various agencies.
Michael N. Josselyn, Ph.D	Directed the survey for potential wetlands mitigation sites and developed mitigation plan.	Twelve years experience in wetlands ecology and mitigation.

8.0 LIST OF AGENCIES, ORGANIZATIONS AND PERSONS TO WHOM COPIES OF THE EIS ARE SENT

Federal

U.S. Department of Transportation

Office of the Secretary, Washington, D.C.

Coast Guard, Fifth District, Portsmouth, VA

Urban Mass Transportation Administration, Philadelphia, PA

U.S. Department of the Interior

Office of Environmental Project Review, Washington, D.C.

Fish & Wildlife Service, Annapolis Field Office

National Park Service, Mid-Atlantic Region, Philadelphia, PA

U.S. Department of Commerce, Deputy Assistant Secretary for Environmental Affairs, Washington, D.C.

U.S. Department of the Army, Corps of Engineers, Norfolk, VA

Environmental Protection Agency

EIS & Wetlands Review Section, Philadelphia, PA

U.S. Department of Health & Human Services

Office of Environmental Affairs, Washington, D.C.

U.S. Department of Housing & Urban Development, Philadelphia, PA

U.S. Department of Housing and Urban Development, Richmond, VA

Advisory Council on Historic Preservation, Executive Director, Washington, D.C.

Federal Emergency Management Agency, Regional Director, Philadelphia, PA

U.S. Department of Agriculture, Office of the Secretary, Washington, D.C.

U.S. Department of Agriculture, Soil Conservation Service, Washington, D.C.

U.S. Department of the Army, Quartermaster Center, Fort Lee, VA

State

Virginia State Air Pollution Control Board

Virginia Department of Agriculture & Consumer Services

Virginia Research Center for Archaeology

Virginia Commission for the Arts

Virginia Department of Aviation

Virginia Department of Conservation and Economic Development
Virginia Council on the Environment
Virginia Office of Emergency & Energy Services
Virginia Commission of Game and Inland Fisheries
Virginia Department of Health
Virginia Division of Historic Landmarks
Virginia Marine Resources Commission
Virginia Institute of Marine Science
Virginia Department of Mental Health and Mental Retardation
Virginia Commission of Outdoor Recreation
Virginia Port Authority
Virginia Soil and Water Conservation Commission
Virginia State Water Control Board
University of Virginia

Local/Regional

City of Williamsburg
- Public Works Department
- City Manager
- City Traffic Engineer
- Mayor
- Planning Department
- Superintendent of Schools
- Department of Parks and Recreation
- Williamsburg Chamber of Commerce

York County
- County Administrator
- Office of Planning and Development
- Chamber of Commerce
- Health Department
- York County Library
- Superintendent of Schools

James City County
- County Administrator
- Office of Planning and Development
- Chamber of Commerce

Peninsula Metropolitan Planning Organization

Peninsula Planning District Commission

Biology Department - College of William and Mary

U.S. Senator John W. Warner

U.S. Senator Paul S. Trible

U.S. Representative Herbert H. Bateman

State Representative George Grayson

State Representative Harvey B. Morgan

State Senator William E. Fears

Appendix A

Questionaire for Little Zion Baptist Church
and Mount Pleasant Baptist Church

HARLAND BARTHOLOMEW & ASSOCIATES, INC.
PLANNING • ENGINEERING • LANDSCAPE ARCHITECTURE

November 12, 1986

The Reverend Richard Holmes
Little Zion Baptist Church
2538 Pocahantas Trail
Williamsburg, VA 23185

Dear Reverend Holmes:

Our firm is working for the Virginia Department of Highways and Transportation on the Environmental Impact Statement for the proposed Route 199 Corridor in James City and York Counties. To complete our environmental assessment, we need some general information about the Little Zion Baptist Church.

We would appreciate your cooperation in completing the enclosed list of questions and returning them in the self-addressed, stamped envelope by November 21, 1986. If you have questions regarding this questionaire, please give me a call. I appreciate your assistance and prompt reply.

Sincerely,

Janit L. Potter

Janit L. Potter

cc: Li Boccia, Project Manager

400 EAST MAIN STREET, RICHMOND, VIRGINIA 23219 (804) 649 • 8627 CABLE: HARPLAN
ATLANTA BIRMINGHAM CHICAGO JACKSONVILLE MEMPHIS RALEIGH RICHMOND ST. LOUIS WASHINGTON, D.C.

Route 199 Cooridor: Questionaire for Little Zion Baptist Church and Mount Pleasant Baptist Church.

Church Name Little Zion Baptist Church

Phone Number 229-9788

Address 8625 Pocahontas Trail, Williamsburg, VA 23185

Pastor's Name Reverend Richard Holmes

Number of People Served by the Church approximately 385

Church Membership approximately 385

Weekly Schedule of Services	Day	Times
	Mondays	7:30 p.m.
	Thursdays	7:00 p.m.
	Wednesdays before the fourth Sundays	7:30 p.m.
	Sundays	11:30 a.m. and evenings (varying times)

Number of people that drive cars to church Majority of people attending church drives

Number of people using a bus to get to church none

Number of people that walk to church only a very small number (approx. 20-25)

In which area do most church attendees live? Williamsburg-James City County area; however, we have many visitors, weekly, who come frmo other areas

Which route or roads do most church attendees take to get to church? Route 60 - Pocahontas Trail - Warwick Boulevard

Date November 23, 1986

Signature Amanda Roberts, Church Clerk

HARLAND BARTHOLOMEW & ASSOCIATES, INC.
PLANNING • ENGINEERING • LANDSCAPE ARCHITECTURE

November 12, 1986

The Reverend William Byrd
Mount Pleasant Baptist Church
529 Burbank St.
Williamsburg, VA 23185

Dear Reverend Byrd:

Our firm is working for the Virginia Department of Highways and Transportation on the Environmental Impact Statement for the proposed Route 199 Corridor in James City and York Counties. To complete our environmental assessment, we nee some general information about the Mount Pleasant Baptist Church.

We would appreciate your cooperation in completing the enclosed list of questions and returning them in the self-addressed, stamped envelope by November 21, 1986. If you have questions regarding this questionaire, please give me a call. I appreciate your assistance and prompt reply.

Sincerely,

Janit L. Potter

Janit L. Potter

cc: Li Boccia, Project Manager

400 EAST MAIN STREET, RICHMOND, VIRGINIA 23219 (804) 649 • 8627 CABLE: HARPLAN
ATLANTA BIRMINGHAM CHICAGO JACKSONVILLE MEMPHIS RALEIGH RICHMOND ST. LOUIS WASHINGTON, D.C.

Route 199 Cooridor: Questionaire for Little Zion Baptist Church and Mount Pleasant Baptist Church.

Church Name_____

Phone Number_____

Address_____

Pastor's Name_____

Number of People Served by the Church_____

Church Membership_____

Weekly Schedule of Services Day Times

_____

_____

_____

_____

Number of people that drive cars to church_____

Number of people using a bus to get to church_____

Number of people that walk to church_____

In which area do most church attendees live?_____

_____

Which route or roads do most church attendees take to get to church?_

_____

_____

_____

_____

Date_____

Signature_____

The survey was not returned from Mount Pleasant Baptist Church.

Appendix B

Wetlands Mitigation

Appendix B

In accordance with Executive Order 11990, "Protection of Wetlands", the Virginia Department of Transportation reviewed the selected alternative, Revised Line A, in an effort to determine if further shifts in the alignment would be possible to reduce or minimize the wetlands required for development of the proposed project. A summary of this review is included in the June 1, 1988 memorandum to Mr. R. A. Mannell from Mr. R. P. Morris. The wetlands acreages cited in this memorandum were checked during the wetlands delineation and are accurately shown on table 5-10 of the FEIS.

Several coordination meetings have been held regarding the M-6A mitigation site and other potential mitigation sites. An interagency coordination meeting was held on January 28, 1988 with a subsequent field review of site M-6A on February 12, 1988. The meeting notes and attendance roster from the January 28, 1988 meeting are included in this appendix. The Wetlands mitigation plan which was developed as a result of the February 12, 1988 agency field review which involved the Fish and Wildlife Service, Corps of Engineers, Virginia Institute of Marine Science and the Virginia Council of the Environment is also included in this appendix.

ENVIRONMENTAL DIVISION
FEB 2 1988
RECEIVED

COMMONWEALTH of VIRGINIA

STATE WATER CONTROL BOARD
2111 Hamilton Street

Richard N. Burton
Executive Director

Post Office Box 11143
Richmond, Virginia 23230-1143
(804) 367-0056

BOARD MEMBERS

Henry O. Hollimon, Jr.
David H. Miller
Ronald M. Plotkin
Velma M. Smith
Patrick L. Standing
W. Bidgood Wall, Jr.
Robert C. Wininger

January 29, 1988

Mr. M. H. Thomas
Environmental Division
Virginia Department of Transportation
1401 East Broad Street
Richmond, Virginia 23219

RE: January 28, 1988, Coordinated Projects

Dear Mr. Thomas:

Following are our comments on this month's project.

No objections to fast track projects (Section B).

Section C. Projects

1. Route 6019 (19) - Modification acceptable if completely remove material upon project completion.
2. Rt. 620, 645, 650 - Std. conditions.
3. Rt. 1309 - Standard Conditions
4. Rt. 697 - Standard bridge conditions
5. Rt. 640 - Provide low flow passage and countersink culvert
6. Rt. 661 - Standard bridge comments
7. Rt. 723 - No objection
8. Rt. 645 - Standard, bridge comments
9. Rt. 648 - Concur with Game and Inland Fisheries - 10/24/83 letter.
10. Rt. 634 - Prefer minimal channelization. If unavoidable, new channel enhancement with DGIF guidance is appropriate.
11. Rt. 252 - Provide low flow passage and countersink
12. Rt. 730 - Standard bridge comments
13. Rt. 601 - Work during low flow conditions
14. Rt. 643 - No objection to modification
15. Rt. 639 - Standard conditions
16. Rt. 606 - Standard conditions
17. Rt. 15 - Standard conditions
18. Rt. 611 - No further comment
19. Rt. 44 - Standard conditions
20. Wetland Bank II - No comments
21. Rt. 199 - No objection to mitigation plan
22. Midtown Tunnel - No further comment at this time
23. Rt. 635 - Standard bridge comments

24. Rt. 501 - Standard bridge comments. Avoid lengthy channel change, or at least minimize it.
25. Rt. 15 - Standard bridge comments
26. Rt. 611 - Standard bridge comments
27. Rt. 630 - Standard bridge comments
28. Rt. 628 - Standard bridge comments

VCP85-2083 Modification Swift Creek. (As per telephone conversation with Ian Frost.) Acceptable if turbidity curtain used and TSS or turbidity monitored with guidance from DGIF.

mbg07/sph

Sincerely,

Michael B. Gregory

cc: M.G.Ferguson, Jr.

ATTENDANCE LIST

JANUARY 28, 1988
IACM

Name	Agency	Phone #
M.H. Thomas	VDOT-ED	804-786-7428
Bob Rubelmann	NMFS	301-226-5771
Lisie Kitchel	DGIF	804-257-8747
Alice Allen-Grimes	COE	804-441-3219
William R. Rudd	VDOT-Culpeper	703-825-8300
R.L. Clatterbuck	VDOT-Culpeper	703-825-8300
Ruth Markey	VDOT-Staunton	703-332-9082
Elaine Surber	VDOT-Bristol	703-669-9979
Richard Claytor	VDOT-Richmond Dist.	804-526-2121
Ian Frost	VDOT-Richmond Dist.	804-526-2121
H. Dean Groome	VDOT-Lynchburg Dist.	804-522-2118
John R. Mcclain	VDOT-Lynchburg Dist.	804-522-2118
Ken Myers	FHWA-Richmond	804-771-2776
L.H. Walker	VDOT-L&D	804-786-3088
John Gill	USFWS-Annapolis	301-269-5448
Bob Zepp	USFWS-Annapolis	301-269-5448
W.G. Beuter	VDOT-ED	804-786-4175
R.E. Veasey	VDOT-ED	804-786-4175
T.E. Hamlett	VDOT-Salem	703-587-5410
S.C. Russell	VDOT-Suffolk	804-539-8701
J.B. Davis	VDOT-Suffolk	804-539-8701
J.L. Potter	Harland Bartholomew & Assoc.	804-320-0447
Bill Elzinga	Env. Science & Engineering	314-567-4600
Derral Jones	VDCHR-DP&R	804-786-9042
Chuck Roadley	VIMS	804-642-7395
Jay Roberts	Council on the Env.	804-786-4500
Ellie Irons	Council on the Env.	804-786-4508
Roy T. Mills	VDOT-L&D,Hydraulics	804-786-9013
D. L. Horton	VDOT-Structure & Bridge	804-786-1315
S. L. Brooks	VDOT-Fredericksburg	804-899-4218
Janet Young	VDOT-Bristol	703-669-9979
Malcolm Cameron	VDOT-Staunton	703-332-9177
M. L. West	VDOT-Richmond L&D	804-786-5869
S. E. Murphy	VDOT-Lynchburg	804-528-6521
Richard Hill	VDOT-Central ED	804-225-3653
Bryan McCormick	VDOT-Central ED	804-786-6671
W. Bruce Aitkenhead	Hayes,Seay,Mattern & Mattern	804-499-2391
David M. Ramsey	VDOT-Central ED	804-786-2576
Guy W. Buford	HSMM	703-343-6971
Howard Noel	HSMM	703-343-6971

January 28, 1988

0199-047-102
0199-047-103

VIII. AGENCY COMMENTS:

A) FEDERAL

FISH & WILDLIFE SERVICE:
Holding comments until site visit.

ENVIRONMENTAL PROTECTION AGENCY:
Not present.

NATIONAL MARINE FISHERIES SERVICE:
Seems to be enough confusion about the site to require a site visit.

CORPS OF ENGINEERS:
Concur with NMF.

UNITED STATES COAST GUARD:
Not present.

B) STATE

VIRGINIA WATER CONTROL BOARD:
Not present.

MARINE RESOURCES COMMISSION:
Concur with VIMS pending site visit.

DIVISION OF PARKS & RECREATION:
Defer to the other agencies.

VIRGINIA INSTITUTE OF MARINE SCIENCE:
Hold comments for site visit.

STATE HEALTH DEPARTMENT:
Not present.

DEPARTMENT OF GAME & INLAND FISHERIES:
Concur with NMF.

COUNCIL ON THE ENVIRONMENT
Concur with NMF.

DIVISION OF SOIL AND WATER CONSERVATION:
Not present.

IX. VIRGINIA DEPARTMENT OF TRANSPORTATION RESPONSE:
Meeting scheduled for February 12, 1988 at 10:30 a.m. at the Jamestown - Scotland Wharf Ferry. The Department will confirm the on-site meeting via letter with a map of the location for assembly.

COMMONWEALTH of VIRGINIA

DEPARTMENT OF TRANSPORTATION
1401 EAST BROAD STREET
RICHMOND, 23219

RAY D. PETHTEL
COMMISSIONER

BARTHOLOMEW AND ASSOCIATES, INC.
RECEIVED
JUN 3 1988

June 1, 1988

Route 199
Proj. 0199-965-101-100
Williamsburg

Memorandum

To Mr. R. A. Mannell

Attn Mr. W. J. Butler

Please be advised that we have reviewed the Route 199 alignment in an effort to determine if further shifts would be possible to reduce or minimize the wetlands required for development of the proposed project.

Upon reviewing this alignment and considering the many constraints in the area, it does not appear that any shifts can be made to significantly reduce the wetlands that will be taken for the development of the proposed project.

It appears that if the ramps are placed on the south side of Route 612 that the acreage of wetlands could be reduced from 3.27 to 1.7 acres. However, I would not recommend that this be done due to the fact that the loops would have to be sub-standard due to property development that is already taken place on the south side of Route 612. This design adjustment would not appear to be reasonable and practical to do at this point.

I believe that the difference in acreage (1.57) could not be justified by the significant safety problem that we would produce by placing all of the ramps on the south side of Route 612.

We have checked the acreage at each of the sites and find that we have a total of 9.77 acres of wetlands within the proposed right of way areas for Route 199. This is somewhat different to some of the acreages indicated previously.

If, of course, the decision is made to place all of the ramps on the south side at Route 612, we would save another 1.57 acres of this amount.

It should also be noted that Sites #15 and #17 will not be involved with this proposed project.

I am handing this roll and information to Mr. Dave Ramsey of the Environmental Quality Division for continuation of his work on the project.

If we can be of further assistance, please advise.

R. P. Morris, Assistant State
Location and Design Engineer

RPM/jbb
Copies:
Mr. Dave Ramsey - attachment
Mr. Alan Siff - Harland Bartholomew

WETLAND MITIGATION PLAN

SITE M-6A

(PROPOSED MODIFICATIONS)

ROUTE 199

Prepared for:

Dr. Steven Bach
WAPORA
1815 Century Boulevard Suite 150
Atlanta, GA 30345

Prepared by:

Wetlands Research Associates, Inc
2169 E Francisco Blvd. Suite G
San Rafael, CA 94901

March 1988

INTRODUCTION

This report provides additional information on a proposed mitigation site (M-6A) for wetland fill required in the construction of Route 199 in James City County, Virginia. The mitigation site is located near the mouth of Mill Creek as it enters the James River. The mitigation site is a farmed field which surrounds a wooded area. Within the wooded area, approximately 1.8 acres of forested wetland (PFOA) has been delineated by David Dumond. A mitigation plan containing two alternatives was submitted by Environmental Science and Engineering of St. Louis, MO (1988). The plan as submitted was determined to be technically inadequate by the Virginia Department of Transportation (VDOT) and a revised plan was requested.

Wetlands Research Associates, Inc., acting as subcontractor to WAPORA, collected additional field information to assess the hydrologic and soil conditions at the mitigation site. Soil borings to describe the underlying soil and the installation of piezometers to determine water table depth were completed. In addition, a water budget model was developed to estimate the hydrologic conditions which would occur under the proposed mitigation plan.

FIELD AND MODELING METHODS

The field work at the mitigation site was conducted on March 14-16, 1988. An elevational survey was conducted from an established benchmark on the Mill Creek Bridge (JT-6; National Park Service). The Park Service was contacted concerning the benchmark elevation and was not able to locate the record (D. Wilking, pers. comm.). An estimated elevation of 14.5 feet was used for the benchmark based on an average roadway elevation of 14.0 ft. above National Geodectic Vertical Datum (NGVD). NGVD is approximately equivalent to mean sea level.

Within the mitigation site, transects were established (Figure 1). Elevations of stations positioned at 50 ft. intervals along the transects were determined using an engineering level and stadia rod. In addition, the elevation of the ground surface surrounding the piezometers was also taken (Figure 1). The survey was closed with an error of 0.1 foot. The elevational data was used to make a contour map (2 ft. intervals) to determine the existing watershed acreage within the mitigation area.

Soil borings were taken both within the forested wetland and in the surrounding agricultural field. Borings were taken with a 2-inch bucket auger and soil samples inspected every 4 inches. The depth of the sampling ranged between 2 ft. in the lowest portion of the site to over 8 ft. in the field. Soils were described using standard soil classification methods. The presence of any water was noted and depth to the water table determined.

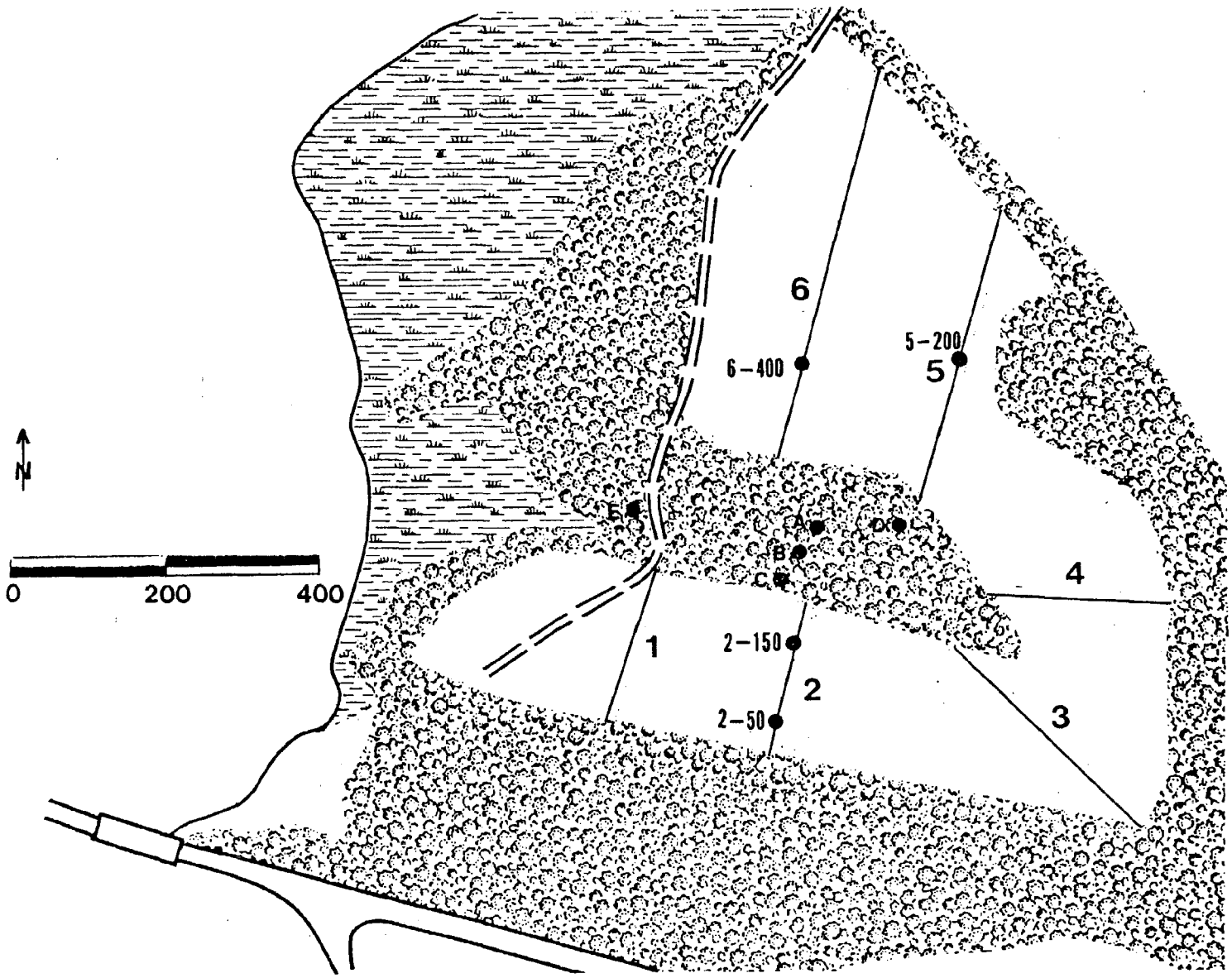


Figure 1. Route 199 Mitigation Site (M-6A) with location of piezometers (A - E) and elevational transects (1 - 6). Soil borings taken at all piezometer locations and at indicated sites on transects.

Wetlands Research Associates, Inc.

Within the forested wetland, 2-inch diameter piezometers were installed to varying depths (Table 1). The piezometers were installed early in the day and inspected throughout the day. (They were left at the site for further measurements as necessary). The piezometers were sealed with clay at the surface and the end taped to avoid penetration of surface water along the exterior and interior sides of the PVC tube. Thus, any water rising in the piezometer would be a true indication of the water table at the depth of the tube.

Finally, a simple hydrologic model was developed to describe the water budget for the site. A conceptual description of the model is shown in Figure 2. The only water input for this site is precipitation. (Ground water does not appear to play a role in the water budget as explained below.) Outputs included evapotranspiration, seepage to soil and ground water, and runoff. For the purposes of the model, seepage to the soil was assumed to be 5 %, though this percolation rate is a maximum estimate given the clay soils present. Base return flows are considered negligible.

Table 1. Location and depth of piezometers installed at Route 199 mitigation site. Surface elevation given relative to NGVD. Height of water in piezometer recorded after 6 hours.

SITE #	LOCATION	SURFACE ELEV.	LENGTH OF PIEZOMETER	HEIGHT OF WATER IN PIEZOMETER	SOIL TYPE
A	Pond edge	4.2 ft	12 inch	0	Clay
			24	0	
B	Above pond	5.0	36	0	Clay
C	Boundary of forest/field	5.2	36	0	Clay
D	Pond edge	4.1	12	0	Clay
			24	12	Organic
E	Below culvert	2.7	24	0	Sand

Data for the model was derived from meteorological data (average monthly rainfall and temperature) recorded by the National Weather Service at the Williamsburg station. The equations and tables of Thornthwaite and Mather (1957) were used to calculate evapotranspiration values, specific to this latitude.

The model was used to calculate the amount of water collected by the watershed, the amount of water ponding on the site, and the amount of water that runs off after evapotranspiration and soil percolation losses.

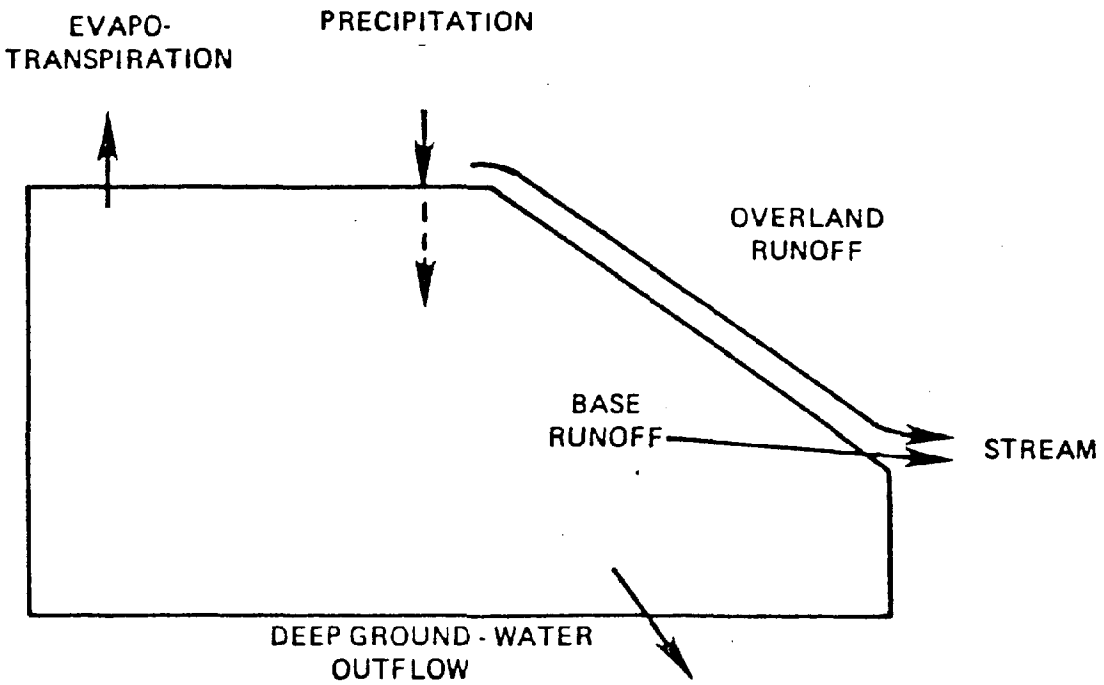


Figure 2. Conceptual model for water budget determination.

Wetlands Research Associates, Inc.

ELEVATIONS AT THE MITIGATION SITE

In general, the elevations determined from the estimated benchmark are within 1 foot of spot elevations determined by other individuals working at the mitigation site. However, these measurements were taken more frequently along transects and therefore, allowed the development of a more detailed contour map for the site using two foot contour lines.

The elevational data for the transects is presented in Figures 3-5. In general, the south field crests near the middle at about 10 ft. Along the eastern edge of the mitigation site, the elevation of the field decreases. At the northwestern portion, the field becomes much wider and once again increases to 10 ft. in elevation.

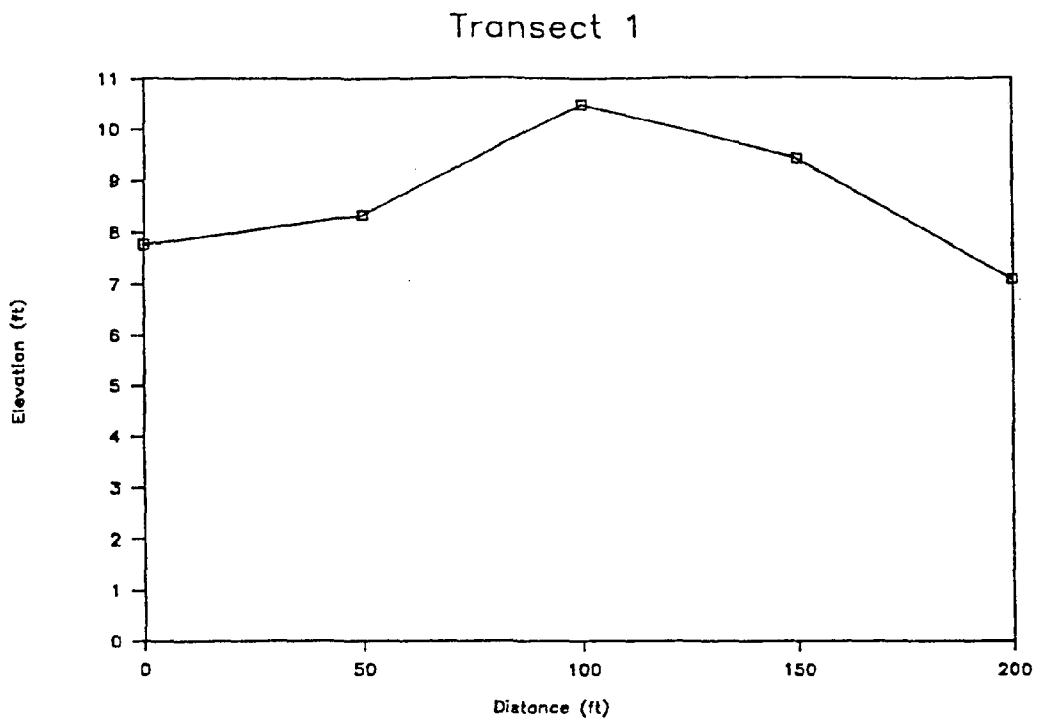
Based on the field data, a contour map was constructed and the watershed currently contributing to the forested area was determined. The acreage in the watershed (including the forested area) is 7.7 acres. The area of the field was also determined to be 10.5 acres.

PIEZOMETER AND BOREHOLE DATA

The lack of water in the piezometers indicates a perched water table. Even the wells placed immediately adjacent to the ponded water showed no water at depth. Only one piezometer of the seven installed had any water in it after one day. The soil surrounding this piezometer had a high degree of organic matter (it was at the base of a large tree). It is probable that the side of the piezometer did not seal well and water may have moved down the side from the surface.

The thick clay layer seen at these sites (Figure 6) effectively blocked the downward movement of surface water or the upward movement of ground water. Except for a moist surface layer (top 12 inches), the remaining clay thickness was dry.

Borehole data at higher elevations confirmed the evidence from the piezometers. Below a shallow sandy loam topsoil, a clay layer of varying thickness is found throughout the site. It slopes gradually towards the existing forested wetland. While moist near the surface, the lower layers of the clay are very dry and brittle. In some cases, sandy clay overlies the clay layer. Sand is found below the clay and in the deepest borehole, the water table was observed at approximately mean sea level. Although this water table may fluctuate slightly with the tides, the clay layer immediately above the sand was dry and appears to block any water movement upward.



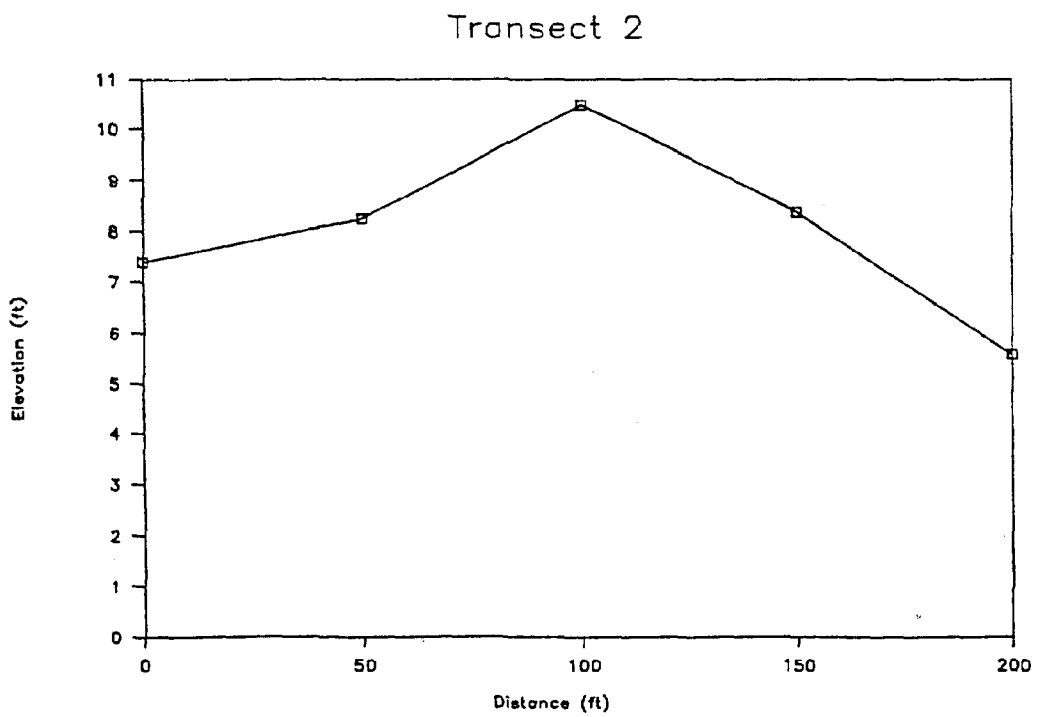
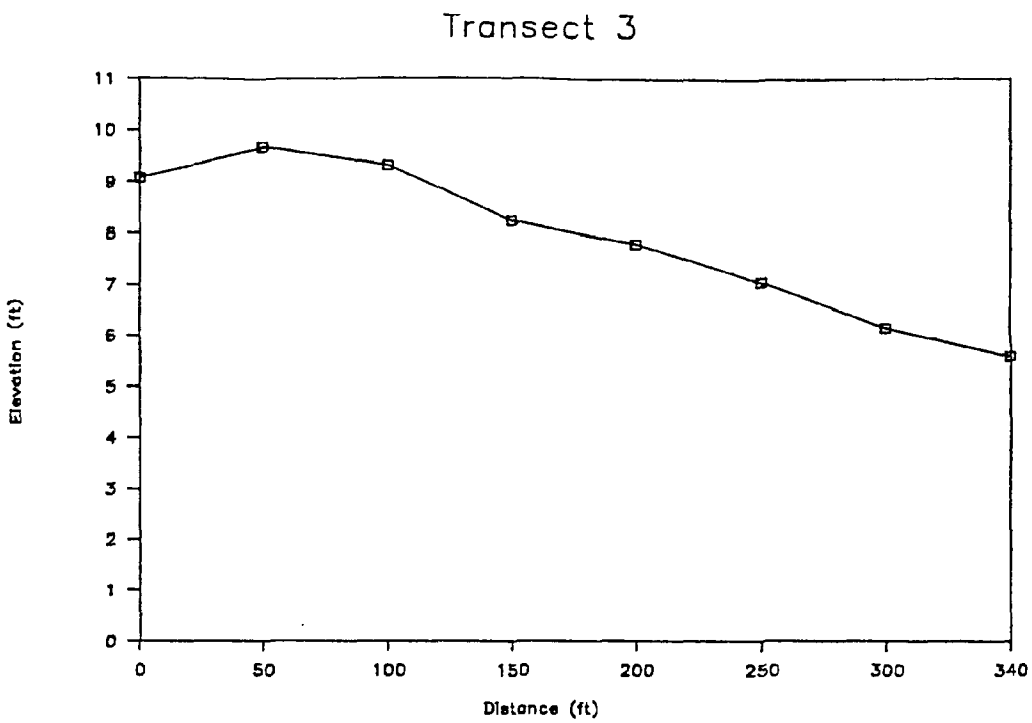


Figure 3. Elevations (relative to NGVD) for transects 1 and 2 at the M-6A mitigation site. Position 0 started on outside border of field opposite of forested wetland in middle of mitigation site.

Wetlands Research Associates, Inc.



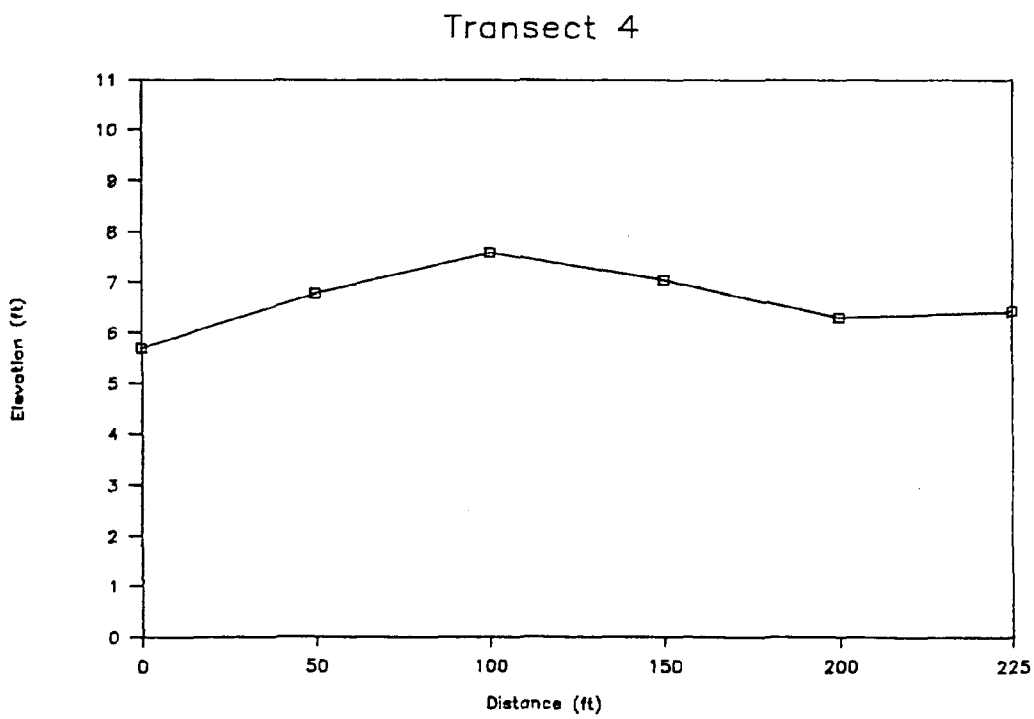
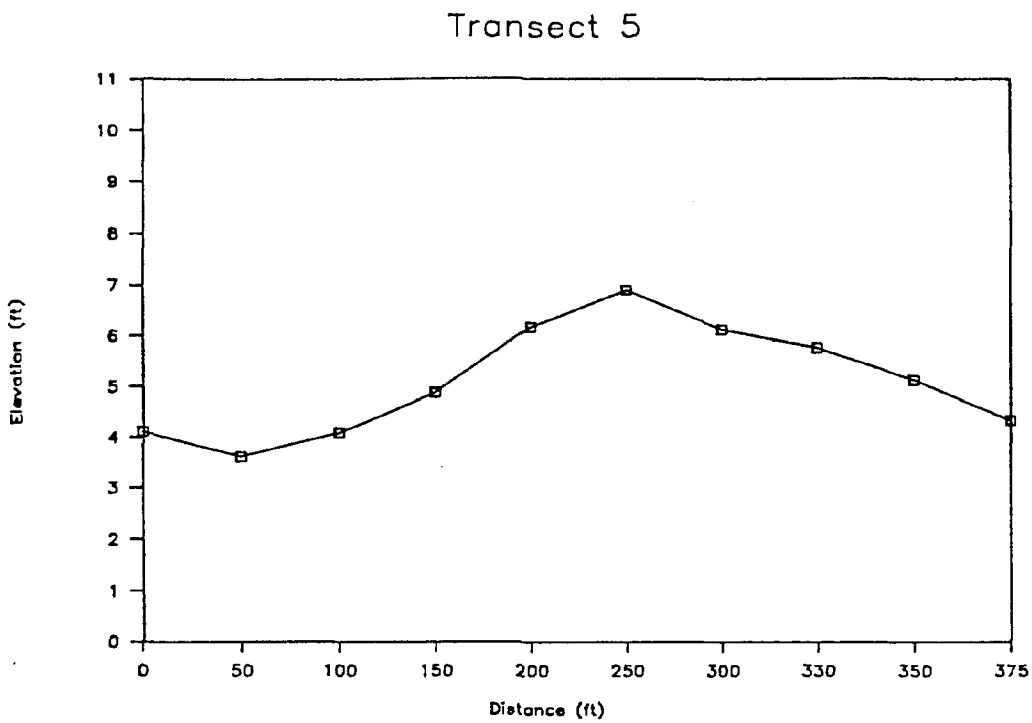


Figure 4. Elevations (relative to NGVD) for Transects 3 and 4 at the M-6A mitigation site. Position 0 started on outside border of field opposite of forested wetland in middle of mitigation site.

Wetlands Research Associates, Inc.



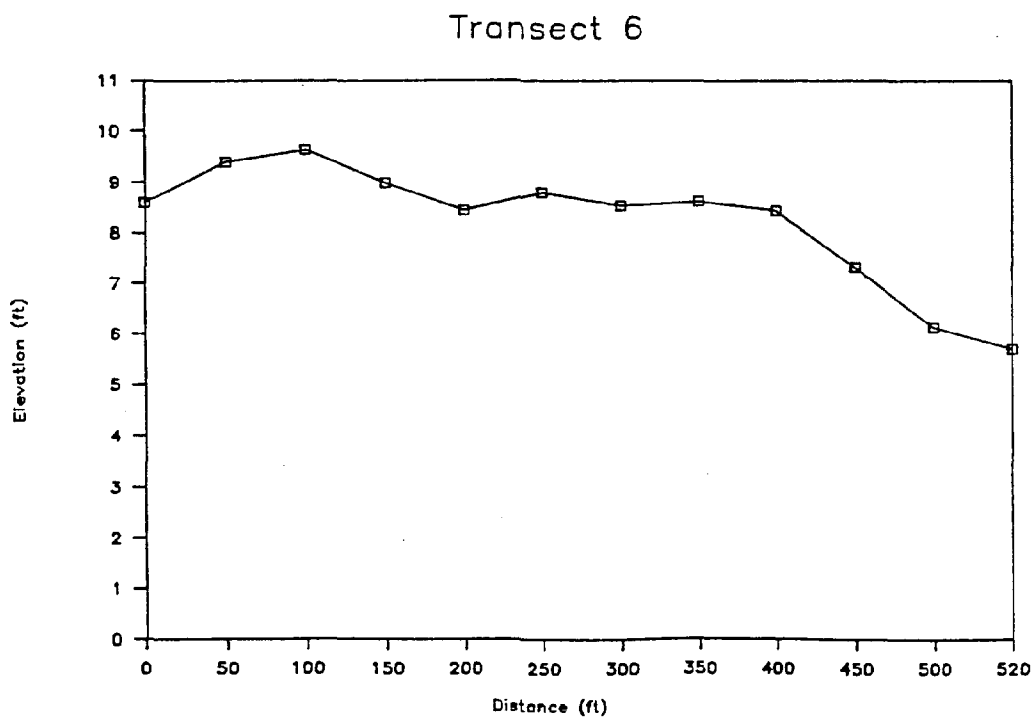


Figure 5. Elevations (relative to NGVD) for Transects 5 and 6 at the M-6A mitigation site. Position 0 started on outside border of field opposite of forested wetland in middle of mitigation site.

Wetlands Research Associates, Inc.

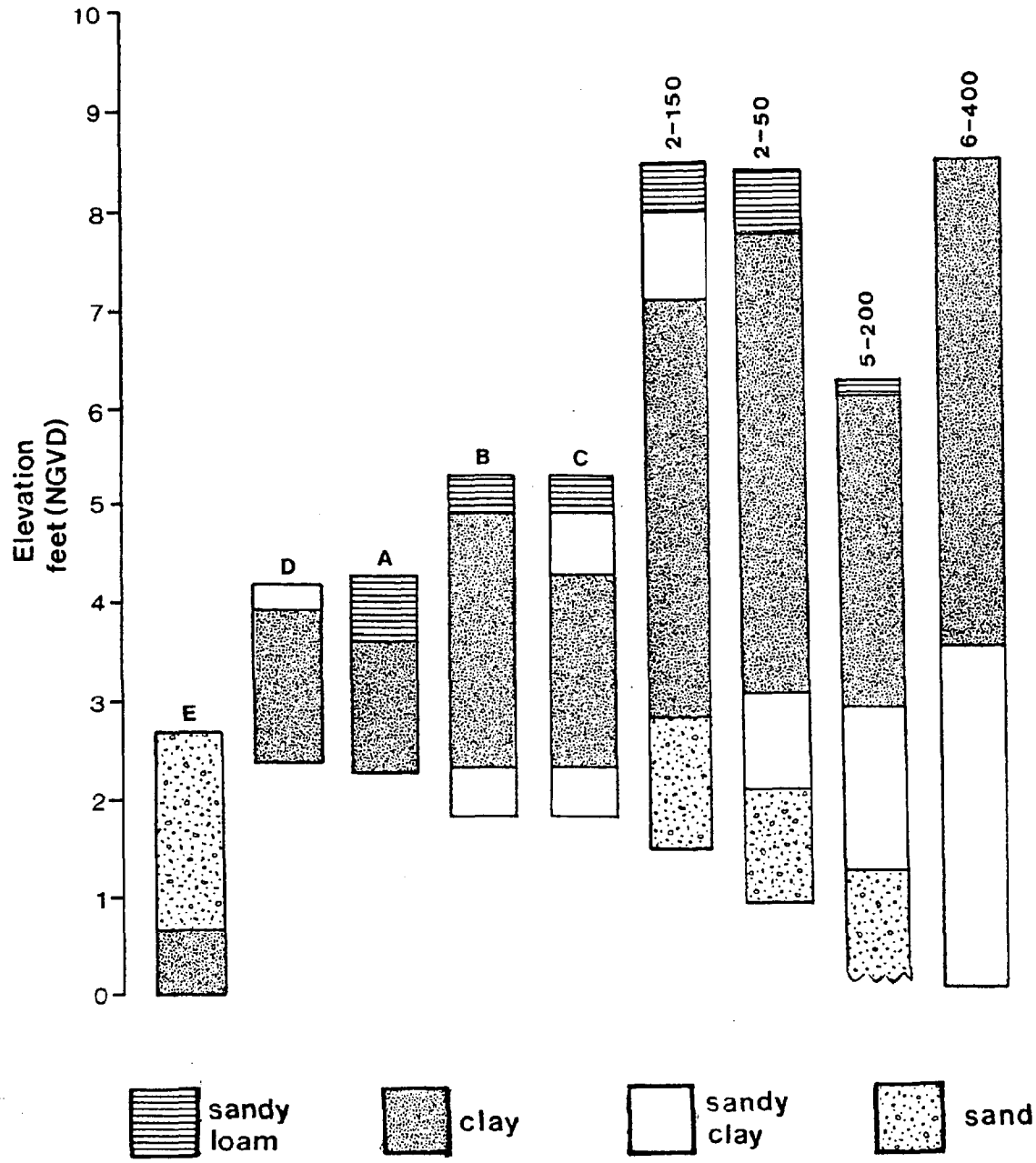


Figure 6. Results of soil borehole data for piezometers and transect stations. Wavy line at bottom of Station 5-200 indicates water table.

Wetlands Research Associates, Inc.

MODELING RESULTS

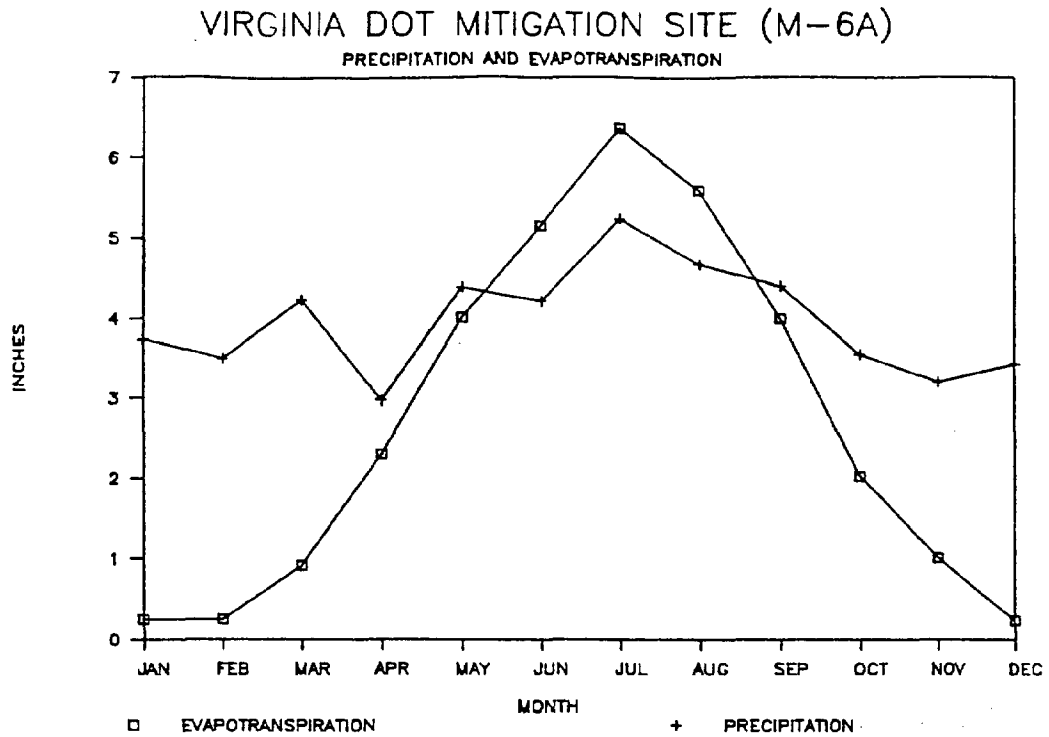
The monthly average precipitation and calculated evapotranspiration for the Williamsburg area is shown in Figure 7. During all months except June, July, and August, precipitation exceeds evapotranspiration. During summer months, evapotranspiration greatly exceeds water input.

Two model runs were made, one which describes existing conditions and the second to determine the maximum amount of acreage that could be converted to forested wetland if the entire field was re-graded to contribute to the watershed (Table 2). Under existing conditions, there is sufficient water (precipitation - evapotranspiration) through the mid-May of each year to contribute to standing water within the wetland. From May to August, the site will not maintain standing water.

If the site was re-graded such that the entire field contributed to the watershed and the water was managed to maximize standing water (using weirs), the model indicates that the maximum ponded area that can be supported is 6 acres. This would require retaining a greater amount of the surface runoff, especially during the late winter, early spring months.

According to the ecological characterization of bottomland hardwoods by Kurz and Godfrey (1962), the existing forested wetland at this site is typified by species in Ecological Zones III and IV. The species in this type of wetland include: Myrica cerifera, Salix nigra, Acer rubrum, Diospryros virginiana, and Liquidambar styraciflua. These species grow best when inundation is less than 35 % of the growing season and greater than 20 % (Teskey and Hinckley 1977). The growing season for the Williamsburg area is April to early-September and therefore, optimal inundation is 2 to 2.5 months. This duration of inundation currently occurs during the spring months.

Dumond also considers the area dominated by Pinus taeda as wetland, though he admits that it is a "line call". This species grows in considerably drier conditions (listed for Ecological Zone V). In fact, it generally cannot tolerate any standing water. The piezometer data collected in this study does not support the inclusion of this area as wetland. Dumond delineated a 1.3 acre forested wetland. If one excludes the Pinus taeda area, the wetland acreage is only 1.0. Therefore, for the purposes of the model and later discussion the area of wetland used is 1.0 acre.



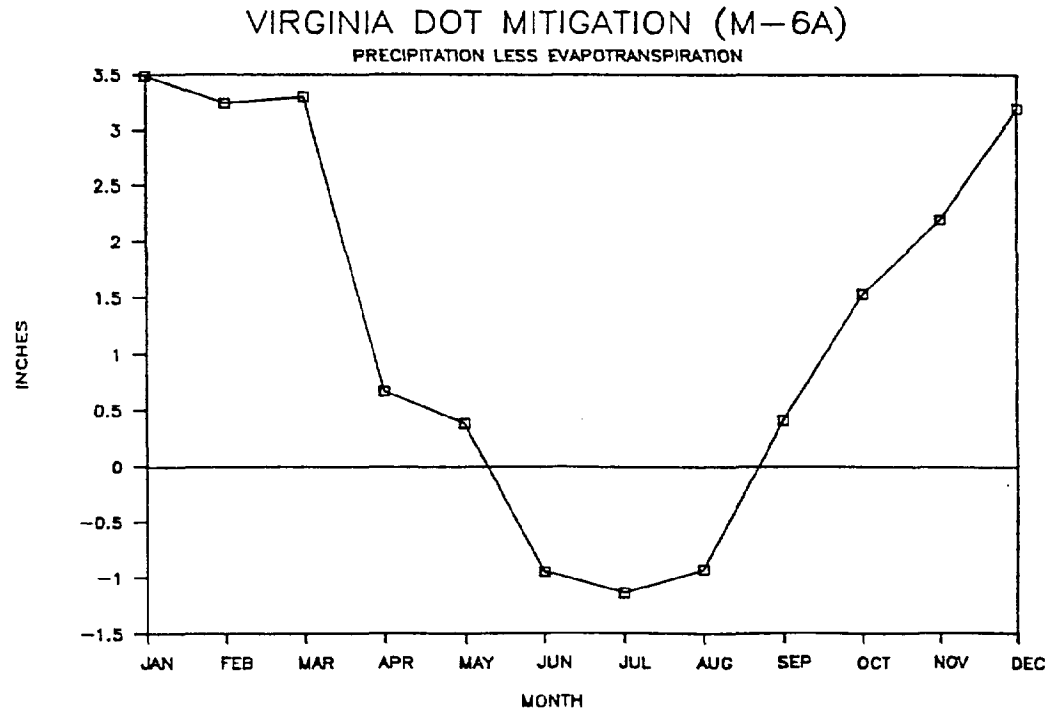


Figure 7. Monthly evapotranspiration and precipitation for Williamsburg, Virginia. BOTTOM: Excess (deficit) of water for Williamsburg, Virginia.

Wetlands Research Associates, Inc.

Table 2. Water budget model runs using data shown in Figure 7 as input. Values expressed as acre-inches. Negative values converted to zero.

Model Run 1. Assume 7.7 acres of contributing watershed. Assume 1.0 acre of ponded water within existing forested wetland. Ponded water has average depth of 6 inches. Remainder of water not retained is estimated as outflow to Mill Creek.

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Water avail.	25.5	23.7	24.1	4.9	2.7	0.0	0.0	0.0	3.0	11.2	16.0	23.3
Amt of runoff after ponding	19.5	17.9	18.1	0.0	0.0	0.0	0.0	0.0	0.0	5.2	10.2	17.3
Percent runoff	68%	66%	56%	0%	0%	0%	0%	0%	0%	19%	41%	66%

Model Run 2. Assume 12.5 acres of contributing watershed. Model run determined that maximum acreage of wetland is 6 acres if all water captured.

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Water avail	41.4	38.5	39.2	8.0	4.5	0.0	0.0	0.0	5.0	18.2	26.0	37.8
Amt of runoff after ponding for 6 ac wetland	5.4	2.5	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8
Percent runoff	14%	7%	7%	0%	0%	0%	0%	0%	0%	0%	0%	5%

RECOMMENDED ENHANCEMENT PLAN

The results of this study show that groundwater does not contribute to the saturation of the soils at this site. Groundwater was found at only one station and at an elevation of 0 ft. NGVD or approximately mean sea level. The groundwater is in a sand layer located below a 3 to 4 ft. thick layer of impervious clay. If the site were excavated to within a foot of this water table, the sand would not be suitable for a forested wetland.

The clay layer acts to retain water at the soil surface. Most of the winter rainfall runs off the site, and a small amount of water is ponded in the forested area. Under existing conditions, the water balance model shows that ponded water can exist on the site throughout the winter and into the early spring.

In order to expand the area of wetland on the mitigation site, the objective of the enhancement plan is to retain as much surface water as possible for the first several months of the growing season. However, as the model indicates, the amount of water which can be ponded during the spring months is only 6 acres. The ponded area would also support some wetland vegetation along the perimeter that would get less inundation. This wetland buffer is estimated at an additional 1.0 acre of wetland. If the 1.0 acre of existing wetland is subtracted, the enhancement site can provide a maximum of 6 acres of mitigation.

The proposed enhancement plan retains the existing forested wetland (Figure 8 and 9). The field surrounding the forested area would be graded such that the entire field (10.5 ac) will contribute to the watershed. In addition, a low berm would be constructed around the existing forested area to retain water at an upper wetland area. The upper wetland area would be created at approximately 5 ft. It would be drained through an adjustable weir to the lower forested wetland. The weir consists of a concrete headwall with a slat for wood boards which can be inserted or removed for a desired water depth. In this case, the bottom of the concrete footing would be at 5 ft. The lower wetland would also have a weir to retain water. The boards in the weirs would be set a 6 ft. and 3 ft., respectively, during the winter and spring months and removed during the summer. Thus, winter and spring flows would be retained on the surface and summer rainfall would be allowed to drain off. The exact height of the weirs and the timing of adjustment will be determined by initial trial and error.

The planting plan for this wetland is similar to that recommended for Zone III in the mitigation plan submitted by ESE (1988).

The advantages of this enhancement plan are that it preserves existing wetland habitat while creating more forested wetland by expanding the size of the watershed by 3 acres and increasing water storage. The enhancement relies on the existing clay layer to retain the surface water. Construction will primarily involve re-grading of the site. Although some soil removal will be required; it will be substantially less than in the original plan.

Thus, the costs are significantly reduced compared to the original plan. The primary disadvantage is that the site will require a greater amount of management than originally envisoned. The weirs will have to be adjusted during the first several years to determine the best management techniques. Following that period of calibration, the weirs need only be adjusted twice yearly.

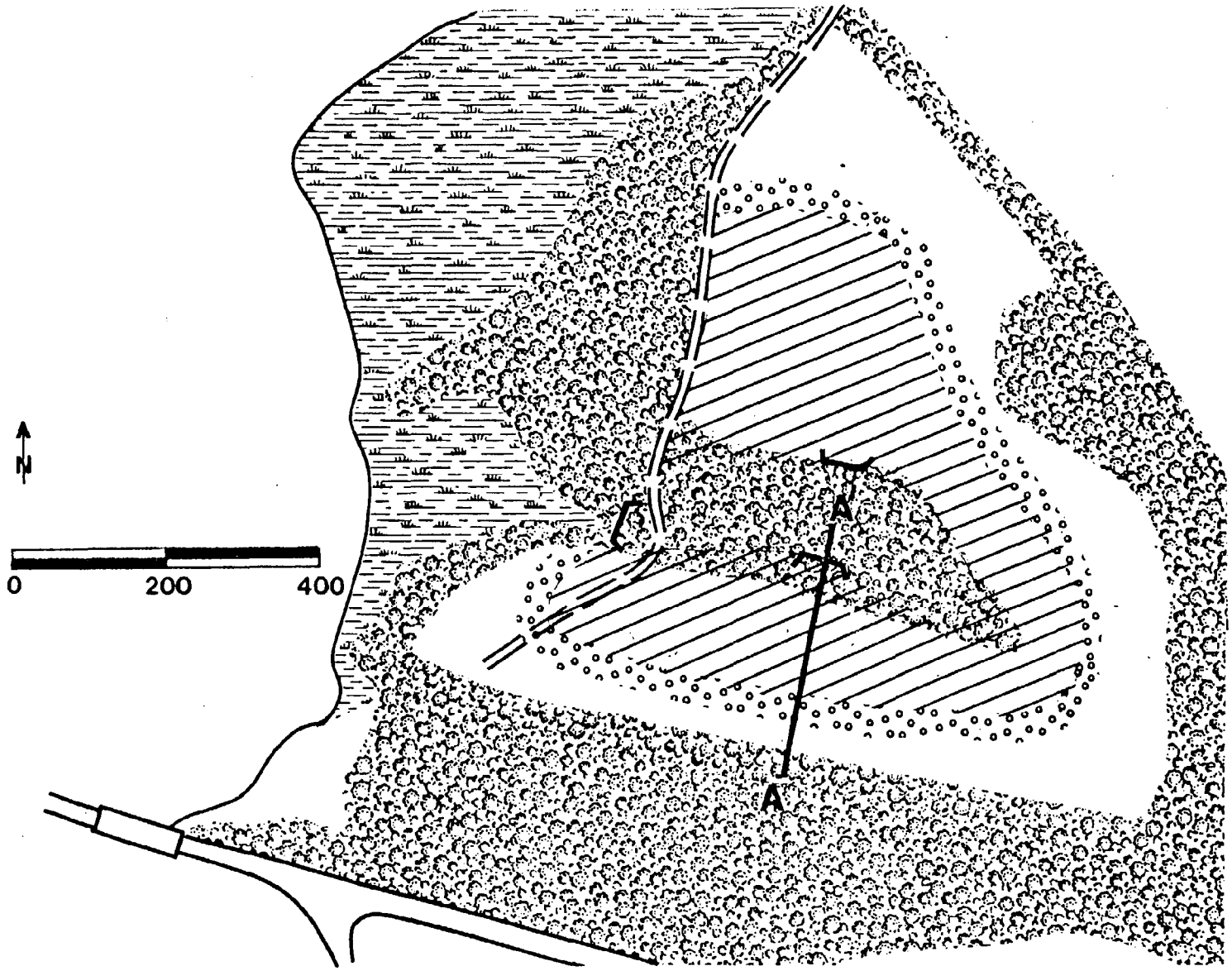


Figure 8. Conceptual plan for Route 199 M-6A mitigation site. Hatched area indicates new wetland acreage added if entire field re-graded to add to watershed. Dotted area shows wetland buffer. Location of weirs shown.

Wetlands Research Associates, Inc.

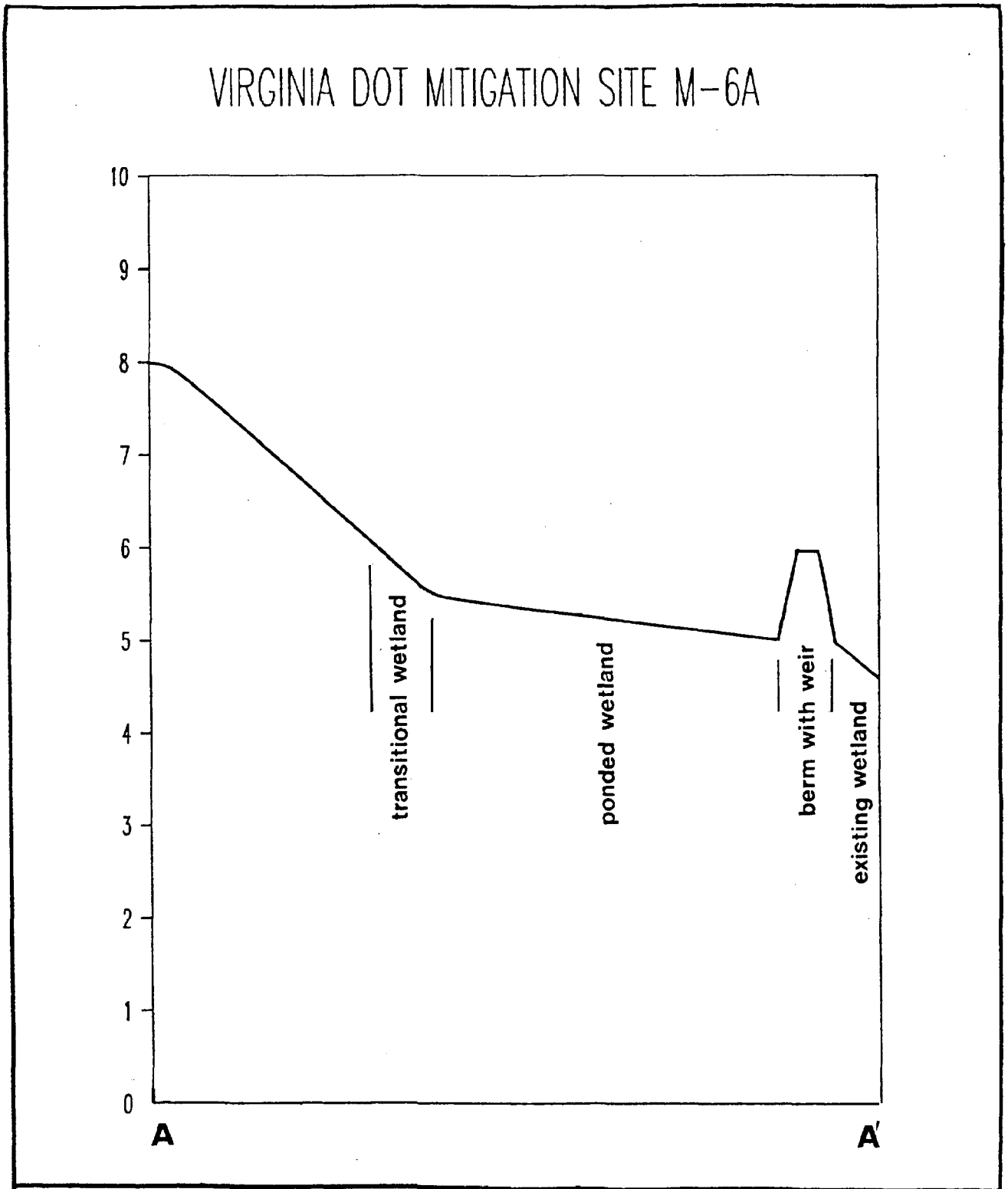


Figure 9. Grading plan for mitigation site M-6A for typical cross-section A - A'. Berm has weirs placed as shown in Figure 8.

Wetlands Research Associates, Inc.

Potential Plant Species for Mitigation and Buffer Zone Plantings

These species have been reviewed during interagency coordination meetings as possible species suitable for the Route 199 mitigation site(s).

Trees

Acer rubrum	red maple
Betula nigra	river birch
Fraxinus pensylvanica	green ash
Ilex opaca	holly
Liquidambar styraciflua	sweet gum
Nyssa sylvatica	black gum
Pinus taeda	loblolly pine
Quercus alba	white oak
Quercus palustris	pin oak

Shrubs

Cephalanthus occidentalis	buttonbush
Lindera benzoin	spicebush
Myrica cerifera	wax myrtle
Myrica pensylvanica	sweet gale
Rosa palustris	swamp rose
Viburnum spp.	blueberry

Herbs

Bidens connata	tickseed sunflower
Cyperus esculentus	nut sedge
Iris pseudacorus	water flag
Iris versicolor	blue flag
Leersia onyzoides	rice cutgrass
Lobelia cardinalis	cardinal flower
Mithcella repens	partridge berry
Peltandra verginica	arrow arum
Pontedaria chordata	pickeral weed
Polygonum spp.	knotweed
Sagitarria latifolia	arrowhead
Saururus cernuus	lizard's tail
Scirpus americanus	bulrush
Scirpus fluiviatalis	bulrush
Scirpus validus	great bulrush
Sparganium eurycarpum	burreed

(Source: ESE, 1985)

Appendix C

Virginia Divsion of Historic Landmarks Coordination

Divisions
Forestry
Historic Landmarks
Litter Control
Parks and Recreation
Soil and Water Conservation

COMMONWEALTH of VIRGINIA

Department of Conservation and Historic Resources

Division of Historic Landmarks
H. Bryan Mitchell, Director

Research Center for Archaeology
Route 238, P.O. Box 368
Yorktown, Virginia 23690
Telephone (804) 253-4836

August 1, 1985

Mr. R.L. Hundley
Environmental Engineer
Dept. of Highways & Transportation
1221 East Broad Street
Richmond, VA 23219

RE: VDHT 0199-965-101,PE-100
Phase I Archaeological Survey

Dear Mr. Hundley:

Thank you for providing this office with a copy of the Draft "Phase I Archaeological Reconnaissance Survey of the Proposed Route 199 Project, James City and York Counties, Virginia" By Mr. Robert R. Hunter, Jr. and Mr. Thomas Higgins, III for our review and comment.

Based upon the survey results presented in the above draft document, we concur with the recommendations made by the authors that phase II investigations and further evaluation on specific sites to determine the potential for National Register eligibility are warranted prior to any construction activities on the selected alternative.

Should you have any questions on the above comments, please do not hesitate to contact our office immediately.

Sincerely,

Bruce J. Larson
Review & Compliance

BJL/th

RECEIVED
AUG 5 1985
ENVIRONMENTAL
QUALITY DIV.

HARLAND BARTHOLOMEW & ASSOCIATES, INC.
PLANNING • ENGINEERING • LANDSCAPE ARCHITECTURE

November 19, 1985

Mr. Bruce Larson
Virginia Historic Landmarks Commission
221 Governor St.
Richmond, Va. 23219

Dear Mr. Larson:

The purpose of the Route 199 study is to prepare an environmental analysis for the area which begins at the intersection of existing Route 199 and Route 5 in James City County and proceeds northward, terminating at the interchange of Route 64 and Route 646 at Burkes Corner. A part of the environmental and traffic analyses for Route 199 includes a cultural resources assessment identified as Task 7 under State Project 0199-965-101, PE101 and Federal Project F-126 (101) between Virginia Department of Highways and Transportation and Harland Bartholomew & Associates, Inc. The goal of this task is to assure that no significant historic or archaeological sites will be disrupted as a result of the Route 199 project study area.

C. Vernon (Tripp) March the environmental review officer of the Virginia Historic Landmarks Commission was contacted June 12, 1985 regarding the historic resources surrounding the Route 199 study site. Based on our discussions, field studies and research of the available literature including the 1978 Draft Environmental Impact Statement for Route 199 which reports that James City County officials and York County officials were consulted on the presence of historic resources in the study area, it is our opinion that no historic resources exist in the Route 199 study area.

The following historic structures were identified outside the study area for Route 199:

1.) The closest standing historic structure to the proposed project is the Lane Farm Site which consists of a late 18th century house and adjacent farm buildings. These structures are located approximately 100 feet east of the proposed road alignment A, are overgrown and are in a dilapidated condition.

2.) Other historic structures in the area include the Cherry Hall Farm, a late 18th century brick house which is located some 950 feet north of proposed alignment A. The house is presently occupied and is in good condition. It is not considered to be in the area impacted by the road alignment.

400 EAST MAIN STREET, RICHMOND, VIRGINIA 23219 (804) 649-8627 CABLE: HARPLAN
ATLANTA BIRMINGHAM CHICAGO JACKSONVILLE MEMPHIS RALEIGH RICHMOND ST. LOUIS WASHINGTON, D.C.

3.) A federal style brick structure with a slate roof is located on the grounds of Eastern State Hospital. Though this structure may be eligible for inclusion on the National Register of Historic Places, it is approximately 2,000 feet from the proposed road alignment A.

A base map of the proposed alignments which indicate the aforementioned historic resources are enclosed with a site vicinity map and photographs of each site discussed. We would appreciate your review and comments regarding the attached documents. If you concur with our findings and agree that no historic structures will be affected by the proposed Route 199, please sign in the space provided at the bottom of this letter. We would appreciate your comments and affirmation of your statement in the form of an executed copy of this letter returned to me no later than December 2, 1985. Please call me if you have any questions.

Sincerely,

Janet L. Potter for

Li Boccia,
Project Manager

Bruce Larson, Virginia Historic Landmarks Commission

cc: R.C. Hundley
Li Boccia

NO ADVERSE EFFECT AGREEMENT

Summary of project and its effect upon archaeological resources identified during the Phase II Evaluation Study within the selected alternative, revised Line A, for Route 199.

Route 199 - James City and York Counties
Federal Project: F-126-1(101)
State Project: 0199-047-102 and 0199-047-103
From: Route 5 in James City County
To: Interstate 64 in York County

A. Description of Project

The Virginia Department of Transportation (VDOT) has proposed the construction of a four-lane highway in James City and York Counties, beginning at the intersection of completed Route 199 and Route 5 to a terminus at the I-64 interchange. Revised Line A, the alternative selected by the Highway Board, is approximately 7.4 miles in length. The right-of-way, for survey purposes, was generally determined at 100 feet wide.

Land use and terrain in the general project area varies considerably, but forest lands predominate in the proposed alternative. Present land use falls into four categories: agricultural, low density residential, rural residential, and commercial. A projection of future land use indicates the area will be predominately residential by 1995. The topography of the project area is typical of the interior near the central drainage divide of the peninsula. It is dissected by numerous small drainages, the majority of which flow toward the James River. Elevations range from over one hundred to less than forty feet above sea level.

B. Description of Prehistoric and Historic Resources Eligible for the National Register

Phase II archaeological examination of fourteen sites located within the proposed Route 199 extension corridor (Alternate A, Revised Line A and A-2), has determined that six sites are eligible to the National Register of Historic Places.

These six sites which will be destroyed by construction of the Route 199 extension, are:

A-3 - Eighteenth-century mill with prehistoric component
A-8 - Prehistoric site
A-12 - Prehistoric site
A-13 - Prehistoric site
A-16 - Prehistoric site
A-17 - Prehistoric site

In order to mitigate the adverse effect of the project on these resources, Phase III archaeological data recovery is required. The purpose of this final phase of work is to retrieve significant information associated with the sites. Retrieval of significant information will be accomplished through a combination of intensive excavation, documentation, laboratory analysis, and report writing. In addition, intensive paleo-ecological testing will be conducted as part of this work in order to reconstruct the changing environmental context of the prehistoric sites within the project area. Further documentary research related to the single eligible historic site will also be conducted.

The prehistoric resources within the project corridor afford an unprecedented opportunity to understand a previously-neglected aspect of the cultural development of the James-York peninsula and the surrounding region. Phase II site examination of the five prehistoric sites has indicated the presence of stratified deposits, hearth and possibly storage features, limited organic preservation, and horizontal separation of functional activities. Preliminary analysis of these sites indicate that they represent the remains of seasonally-occupied resource procurement sites with components ranging from the Late Archaic period (2000-1200 B.C.) to the Late Woodland period (A.D. 900-1600). The preliminary data also suggest that the interior areas of this portion of the James-York Peninsula were most intensively utilized during the Middle Woodland period (500 B.C. - A.C. 900).

The Phase II investigations of the proposed Route 199 corridor also examined eight historic-period archaeological sites. Only one of these sites, A-3, appeared to be

eligible to the National Register. This mill complex consists of an earthen dam, 280 feet long and eight feet high, two large borrow pits, and the mill headrace.

Evidence for the mill does not appear on the Pechon map (1781) nor on the Gilmer map (1863). Nonetheless, the name "Mill Creek" suggests milling activity along the creek, possibly as early as the eighteenth century. Documentary research brings to light evidence of property ownership as well as indirectly suggests the type of function attributable to this site during the mid-eighteenth century. Furthermore, it establishes a clear transition of ownership well into the nineteenth century, and as early as 1854 refers to the site as "Indigo Dam." Interestingly, the present-day Indigo Dam lies just a few hundred feet to the northwest and is part of the modern housing development known as Indigo Terrace. Although the current reference names to indigo are not documented for the site prior to the mid-nineteenth century, the growing of this crop is known to have taken place in its vicinity one hundred years earlier. This endeavor seems to have been quite fashionable during the late 1750s to early 1760s and was grown locally by a well-known planter. Colonel Philip Ludwell III, whose Rich Neck plantation incorporated this mill site and at least two more mills in the area, produced the indigo, of which a large quantity was sold following his death in 1767. Ludwell's nearby Green Spring plantation was exceptional in producing large quantities of indigo of which but little was raised elsewhere in Virginia.

The mill site may provide very important historical and archaeological information relevant to the milling process as practiced on large plantations in James City County in the early to mid-eighteenth century. To date, no site of its kind has yet been investigated on the James -York peninsula, and perhaps in the entire Virginia Tidewater. Considering the documentary evidence of indigo cultivation within the immediate vicinity of the site, the conditions under which the crop is grown, and the prominence of the grower, a great deal may be learned about the local cultivation and processing of a valued crop during the colonial period. For these reasons, the site is considered eligible for nomination to the Register of Historic Places.

In addition, a small prehistoric component at this location is considered important due to the deeply buried nature of Archaic-period components. However, much of the area has been previously disturbed by the eighteenth-century borrow pits. An adequate sample of these prehistoric resources can be recovered as part of the data recovery for the historic component at the site.

C. Reasons for Finding of No Adverse Effect

The SHPO has determined that in-place preservation of the properties is not necessary to fulfill the goals of the State Historic Preservation Plan. The properties are significant for the information they contain only, and appropriate funds and time will be committed to adequately retrieve the information. The adequacy of the mitigation will be reviewed by the SHPO. Any comments by the SHPO will be addressed by the lead agency through the VDOT and its consultant.

D. Comments from the State Historic Preservation Office (SHPO)

The SHPO has reviewed the Phase II (significance evaluation) report that describes the site and concurs with the author's recommendation that the sites be considered eligible for the National Register of Historic Places. The SHPO concurs with the determination of no adverse effect as long as the mitigation of the impact of the project is approved by that office.

E. Comments from the Federal Highway Administration (FHWA)

The FHWA concurs with the SHPO in the significance of the sites and the determination of no adverse effect. The FHWA agrees to ensure that the mitigation of the impact of the project upon the site will be at a level acceptable to the SHPO. The FHWA has determined that final approval of the no adverse effect indicates that Section 4(f) does not apply.

F. Comments from the Virginia Department of Transportation (VDOT)

The VDOT, responsible for the construction of the project, has discussed the site and the impact of the project with FHWA and SHPO. The VDOT will work with the FHWA to help provide for the mitigation of the impact its project will have on the

archaeological site. The archaeology staff at the VDOT will work closely with a consultant and the SHPO to be certain that the retrieval of information from the site is adequate and acceptable to the review agency.

Federal Highway Administration
Division of Historic Landmarks
Virginia Department of Transportation

Route 199 - James City and York Counties
Federal Project: F-126-1(101)
State Project: 0199-047-102 and 0199-047-103
Archaeological Sites A-3, A-8, A-12, A-13, A-16, and A-17.

We have jointly reviewed the plans and data for the described project and agree that it will have no adverse effect on the National Register Property involved.

Date 10/17/88

For the Division Administrator, FHWA

Date 10/13/88

State Historic Preservation Officer
Division of Historic Landmarks

Date Oct 12, 1988

Environmental Engineer
Virginia Department of Transportation

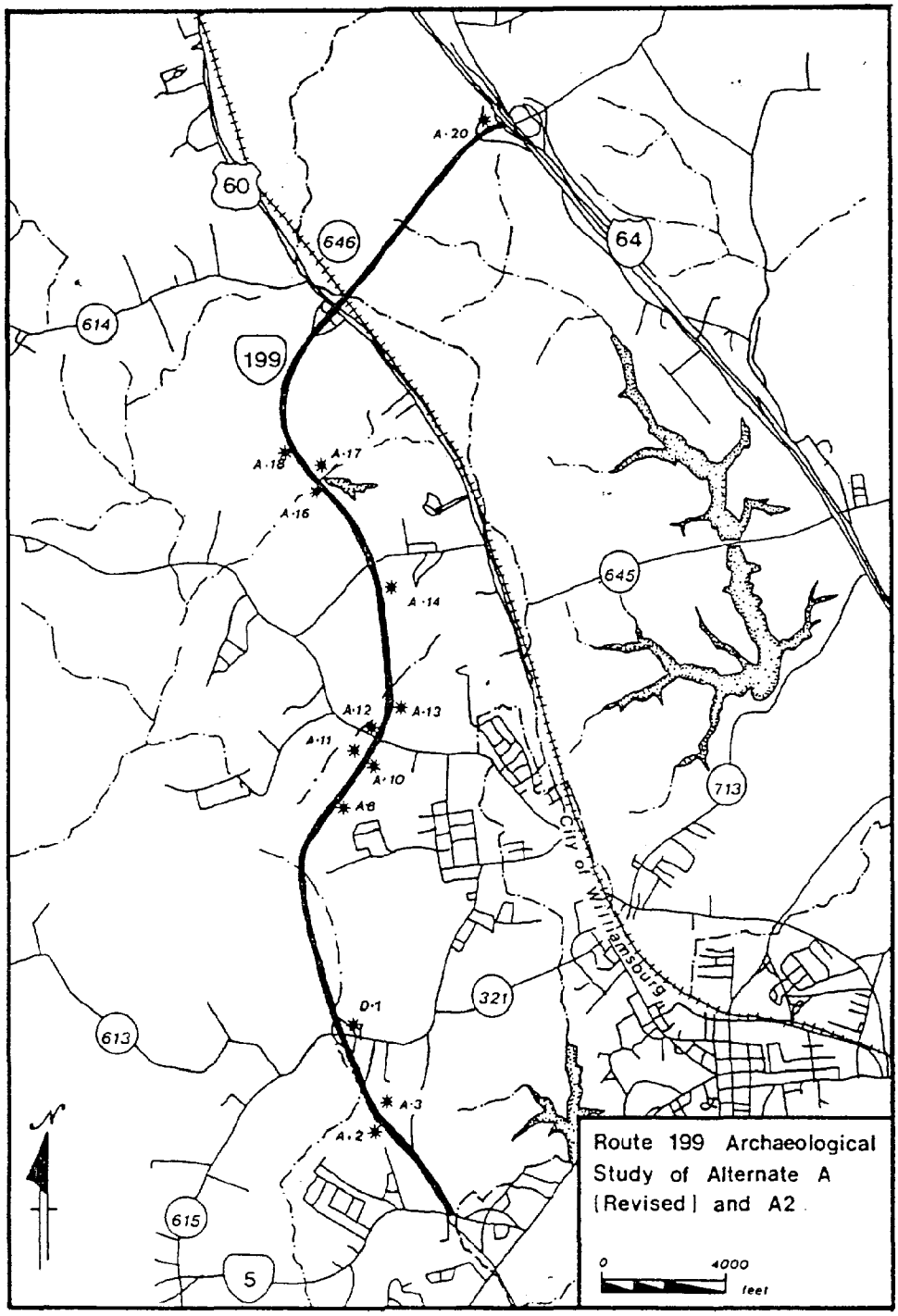


Figure 1--Location of Archaeological Sites Identified for Phase II Evaluation.

Advisory Council On Historic Preservation

The Old Post Office Building
1100 Pennsylvania Avenue, NW, #809
Washington, DC 20004

OCT 28 1988

Mr. James M. Tumlin
Division Administrator
Federal Highway Administration
400 N. 8th St.
P.O. Box 10045
Richmond, VA 23240-0045

REF: Construction of Rt. 199
James City and York Counties, Virginia

Dear Mr. Tumlin:

On October 19, 1988, the Council received notification of your determination that the referenced project would not adversely affect several archeological sites eligible for inclusion in the National Register of Historic Places. We have reviewed your supporting documentation, including the conditioned concurrence of the Virginia State Historic Preservation Officer, and see no reason to object based on your agreement to work with the Virginia SHPO on further archeological investigations prior to construction.

Your completion of the commitments outlined in your documentation will evidence that the requirements of Section 106 of the National Historic Preservation Act and the Council's regulations have been met for this project. Both this letter and your supporting documentation should be retained in your environmental or project files.

Thank you for your continued cooperation.

Sincerely,

John L. Klima
Director, Eastern Office
of Project Review

Appendix D

Endangered Species (Isotria medeoloides)

BIOLOGICAL ASSESSMENT

OF

ISOTRIA MEDEOLOIDES
(Small Whorled Pogonia)

HARLAND BARTHOLOMEW AND ASSOCIATES RICHMOND, VA.
RECEIVED OCT 20 1986

October, 1986

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INTRODUCTION

The Virginia Department of Highways and Transportation (VDH&T) proposes to construct a four lane, divided, section of controlled access highway beginning in the vicinity of the intersections of completed Route 199 and Route 5 in James City County and ending in the vicinity of the existing I-64 interchange with Route 646 in York County. This section of road will complete the partially constructed Route 199 facility.

The Draft Environmental Impact Statement (DEIS) prepared in January 1986 discussed four build alternatives and the no-build alternative. During the development of the DEIS it was identified that one of the primary construction alternatives under consideration was adjacent to a colony of the federally endangered plant species Isotria medeoloides (the small whorled pogonia).

After this endangered species was identified, the Department began extensive coordination with a recognized expert, Dr. Donna Ware, of the College of William and Mary, the U.S. Fish and Wildlife Service, and the Virginia Department of Agriculture and Consumer Services. The Location Public Hearing was held on April 3, 1986, and with the comments received from the public and other agencies along with the cooperation of the experts, a new alternative was developed for the specific purpose of avoiding Isotria medeoloides. That alternative, Revised Line A, was selected for use by the Department in completing the construction of Route 199.

The purpose of this Biological Assessment is to discuss the endangered species Isotria medeoloides and it's relationship to the proposed highway project's selected alternative.

This document is prepared in response to and compliance with Section 7(c) of the Endangered Species Act of 1973, as amended (16 U.S.C. 1536(c)).

ALIGNMENT ALTERNATIVES

ROUTE 199 CORRIDOR

JAMES CITY AND YORK COUNTIES
VIRGINIA

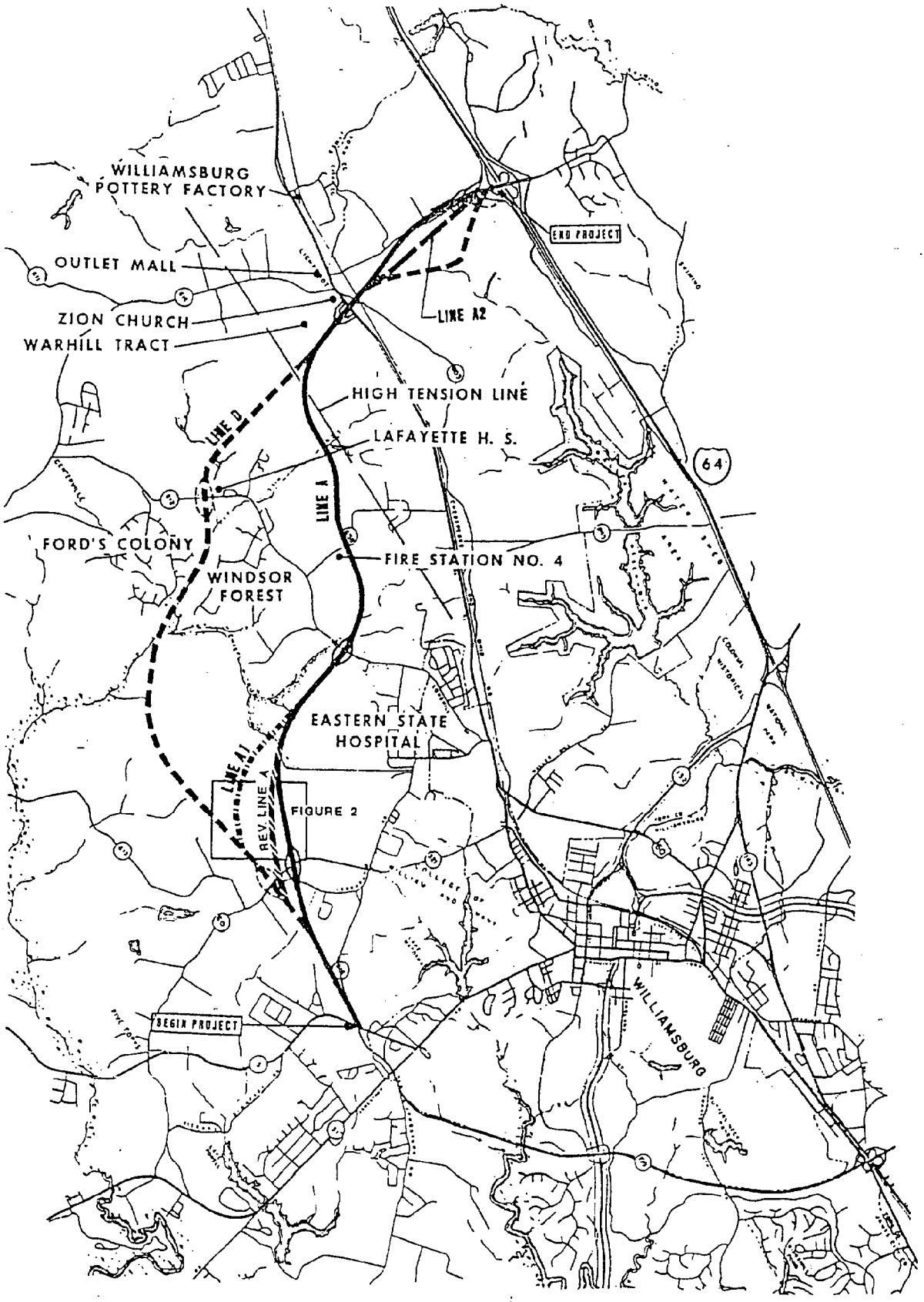
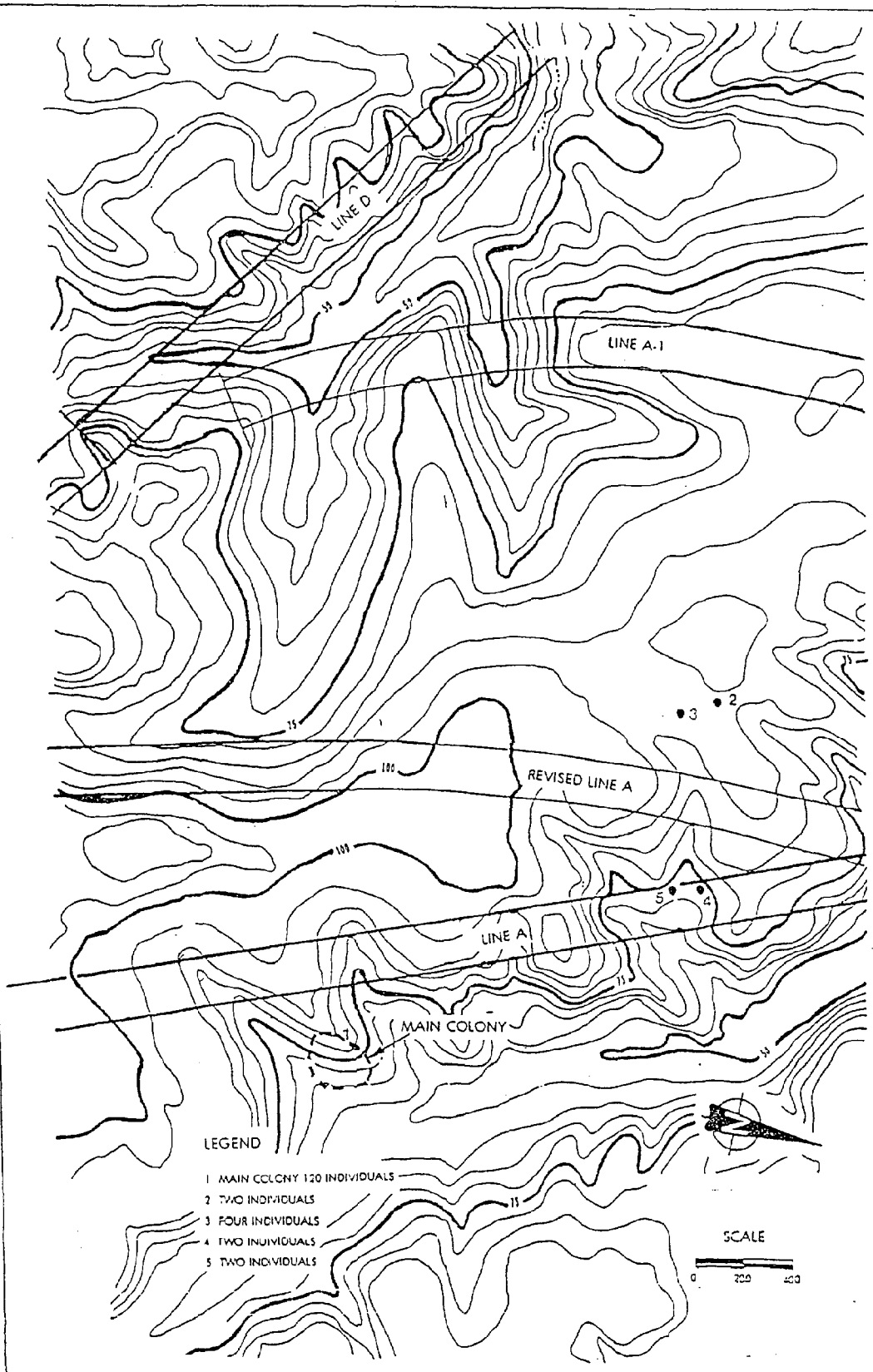


FIGURE 1



RELATIONSHIP OF ISOTRIA MEDEOLOIDES POPULATIONS TO ALIGNMENTS A, A-1, AND REVISED A

FIGURE 2

DESCRIPTION OF PROPOSED WORK

The proposed project is located in the vicinity of the City of Williamsburg, which lies in east-central Virginia on a peninsula of land surrounded by the James River, York River, and Chesapeake Bay.

The Virginia Department of Highways and Transportation (VDH&T), in conjunction with the Federal Highway Administration (FHWA), is proposing to extend Route 199 from Route 5 to I-64. Construction of this segment of Route 199 will form a circumferential system which will serve as (1) a collector for internal traffic in Williamsburg, (2) a bypass for through traffic around Williamsburg, (3) a link which will tie together the existing road systems, and (4) access into the mid-James City County area.

The proposed Route 199 is a controlled access, 4-lane divided highway beginning at the intersection of the previously completed Route 199 and Route 5 and continuing northward to its terminus at the interchange of I-64 and Route 646 (see Figure 1).

Three alternative concepts, Lines A, D and A-2, were originally studied. Line A is 7.4 miles in length and would cost $26,933,000 to construct. Line D is approximately 8.1 miles long and would cost $28,287,000. Line A-2 was added in between Lines A and D at the north end of the project, running for approximately 1.3 miles from Route 60 to I-64. The purpose of this alternative is to improve access conditions in the vicinity of the Williamsburg Pottery Factory/Route 646 and is not involved with the endangered species.

Line A was considered to be the preferred alternative because it resulted in less overall impact and was approximately $1,354,000 cheaper to build than Line D.

A colony of small-whorled pogonias (Isotria medeoloides), an endangered plant species, was discovered in the southern section of the project. During the environmental analysis this colony of I. medeoloides was determined to be within

100 feet of Line A. This Line would also have taken two individual plants from a smaller historical colony (see sites 4 and 5, figure 2). Line D did not traverse this area.

At this time, the Department coordinated with Dr. Donna Ware of the College of William and Mary and the Department of Agriculture and Consumer Services, the State agency responsible for administering the Virginia Endangered Plant and Insect Species Act, and developed Line A-1 which avoided the endangered plant but would add approximately 1.6 million dollars to the cost of Line A.

After receiving public input at the Location Public Hearing and coordinating with the same experts, one additional adjustment to Line A was studied for the purpose of avoiding the Isotria medeoloides. That adjustment is identified on Figure 1 as Revised Line A. The increase cost associated with using Revised Line A to avoid the small-whorled pogonias is approximately $200,000 over Line A. While this represents an increase in project cost it is the least expensive option for constructing the project and avoiding the endangered plants.

IDENTIFICATION OF ENDANGERED SPECIES

The endangered orchid, Isotria medeoloides (small whorled pogonia), is a federally endangered or threatened species listed by the U.S. Fish and Wildlife Service known to occur in the project area. Isotria medeoloides is also listed as endangered by the Endangered Plant and Insect Species Act of Virginia (1984).

The species had historically been known from 60 sites in 16 states and one county in Ontario (Crow, 1982). However, at the time of listing only 16 populations were known in 10 states and one county in Canada. New discoveries through the field season of 1983 increased the number of known populations to 33 and the number of individuals to 2,500 (U.S. Fish and Wildlife Service, 1985).

Four populations are known to occur in the Commonwealth of Virginia. Two of these populations are located in the project area in the vicinity of Chisel Run near Lines A, A-1, and Revised Line A. The larger population first discovered in 1982 consists of approximately 144 individuals, while the recently rediscovered population at the historic "Grimes Site" consists of ten specimens (Donna Ware, personal communication 1986). The colony of the historical "Grimes Site" was originally discovered by Professor E. J. Grimes of William and Mary in 1921, and since the death of the caretaker some 12 years ago, knowledge of its exact location had been unknown (see sites 2, 3, 4, 5; figure 2).

The relationship of these small whorled pogonia populations to the various lines are shown in Figure 2.

In recent years, most research has focused on attempts to discern the reproductive biology and ecology of Isotria medeoloides (Mehrhoff, 1980; Ware, 1985; Homoya, 1977; and Brackley, 1981). Throughout its range, I. medeoloides is found in a variety of medium-aged woodland habitats such as deciduous woods in Canada (Argus

and White, 1982), open mixed hardwood in New England (Crow, 1982), and oak/hickory forests in Illinois (Scheviak, 1974).

A common characteristic of many sites visited by Mehrhoff (1980) and Brackley (1981) was the open tree canopy. Mehrhoff found that an increase in vegetative cover (i.e., less light penetration) had negative effects on the reproductive viability of I. medeoloides. Similarly, Brackley (1981) found that a small population under a closed canopy increased in vigor when the canopy was defoliated by gypsy moth.

In New England, Isotria medeoloides seems to prefer slopes with an eastern orientation that are dissected by vernal streams. A frequent habitat feature is a subsurface soil hardpan or acidic soils (shallow-to-bedrock) that promote a subsurface sheet flow of water (Rawinski, unpublished). Isotria medeoloides is frequently associated with vernal stream leaf deltas where it has been found associated with mycorrhizal fungi. Homoya (1977) has suggested that I. medeoloides is associated with different species of fungi depending on habitat type. However, these and other cryptic habitat requirements of I. medeoloides remain unknown.

Little is known about the reproductive biology of I. medeoloides. Mehrhoff (1980), however, did show that it is primarily a self-pollinating species. Evidence suggests that its primary mode of reproduction is by seed rather than by vegetative means. Attempts at seed germination and transplantation have been unsuccessful (Paulos, 1985).

Field reviews of the Route 199 project area were conducted in May and August 1985 by Virginia Department of Highways and Transportation, U.S. Fish and Wildlife Service, and Dr. Donna Ware. The populations of I. medeoloides in the vicinity of Chisel Run were found on slopes having an eastern aspect with an arboreal community of white oak (Quercus alba), red maple (Acer rubrum), sweet gum (Liquidambar styraciflua), scattered loblolly pines (Pinus taeda), hickories (Carya spp.) and,

sourwood (Oxydendron arboreum). The sparse shrub layer is composed of flowering dogwood (Cornus florida), American holly (Ilex opaca), and spicebush (Lindera benzoin). The herbaceous community is composed primarily of Christmas fern (Polystichum acrostichoides), partridgeberry (Mitchella repens), and American strawberry bush (Eunonymous americanus).

The populations at Chisel Run are currently under ongoing investigation by Dr. Donna Ware of the College of William and Mary. Dr. Ware discovered the main colony in 1982 and has been conducting population studies over the past 3 years. It currently consists of approximately 144 individuals, making it the largest and perhaps the most significant population south of New England (Ware, 1985).

ASSESSMENT OF POTENTIAL IMPACTS

As shown in Figure 2, Revised Line A is located approximately 1100 feet west of the main colony (1) of I. medeoloides and is 220 feet from site 4, 240 feet from site 5, 260 feet from site 3, and 340 from site 2.

The selected alternative, Revised Line A, will not take any of the plants.

An indirect impact of I. medeoloides may be from highway runoff and altered subsurface drainage patterns due to roadway excavation and compaction. A possibility exists that exotic plant species which become established in the right of way may compete with nearby colonies.

An additional indirect impact of the construction of the proposed roadway between plant sites 2 and 3, and sites 4 and 5 may be the reduction of adjacent available habitat and introduction of a barrier to seed dispersal.

MITIGATION OF POTENTIAL IMPACTS

Four mitigative measures can be taken to reduce the potential indirect impacts of Revised Line A. First, preserve wooded stands in the right-of-way upslope of known populations to act as a buffer zone. This would reduce the potential for competition with exotic plant species and reduce effects from thermal convection, runoff, etc. Second, biologists at the College of William and Mary will study the area during and after construction to identify any changes. Third, the Department has selected Revised Line A at an additional cost of $200,000 over Line A to avoid a direct take of any plants and miss the main colony by 1100 feet. Fourth, the Department will install and maintain strict erosion and siltation control measures in accordance with the Virginia Erosion and Sediment Control Handbook and VDH&T's Road and Bridge Specifications and Erosion and Siltation Control Manual.

CONCLUSIONS

Based on the information provided above the Virginia Department of Highways and Transportation has concluded that the selection of Revised Line A and implementation of the mitigation measures discussed will minimize any impacts to *Isotria medeoloides*.

REFERENCES

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Rawinski, T. Unpublished data. The Nature Conservancy. Eastern Heritage Task Force.

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Ware, D.M.E. 1985. Reprieve for an Orchid: The Status of the Small Whorled Pogonia in Virginia. Jeffersonia 16(2): 27-35.

Ware, D. M. E. 1986. Personal Communication. College of William and Mary, Williamsburg, Virginia.

APPENDIX A

Letter dated July 2, 1986, From the Virginia Department of Agriculture and Consumer Services

S. MASON CARBAUGH
COMMISSIONER

RAYMOND D. VAUGHAN
DEPUTY COMMISSIONER

COMMONWEALTH of VIRGINIA

DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES
P. O. Box 1163, Richmond, Virginia 23209

July 2, 1986

Mr. Robert L. Hundley
Environmental Engineer
Department of Highways and Transportation
1221 East Broad Street
Richmond, VA 23219

Dear Bob:

This letter is a follow-up to meetings and discussions your staff and members of our Division of Product and Industry Regulation have had concerning the alternative plans your agency is considering for construction of Route 199 in James City County, Virginia. Since the proposed portion of Route 199 running through York County is not in proximity to any threatened or endangered plants, I will not address that segment.

My staff advises me that your Department developed several alternative routes for Route 199 through James City County. Some of the alternatives were developed to offer protection to a large colony of Isotria medeoloides located near Chisel Run. While these alternatives were under active consideration, a smaller colony of I. medeoloides was discovered near Alternative A-1.

On June 9, 1986, members of my staff met with Dr. Donna Ware of the College of William and Mary and officials of your agency, including Jack Stewart, Robert Morris, Vincent Valenti, R. E. Pickett, and Don West, to evaluate a new alternative (designated as Refined Line A) developed by your staff in an effort to protect both colonies of I. medeoloides.

I understand that it was the general consensus of those present at this June 9 meeting that the new Refined Line A alternative will have the least impact on the Isotria medeoloides population. My staff advises me that while it does appear that even Refined Line A will come close to the newly discovered colony of I. medeoloides, located in James City County, this alternative provides protection for the largest colony of I. medeoloides south of New England, while reducing the increased cost of Alternative A-1. I am told that Refined Line A may also lessen the impact of Route 199 on the current landowners.

It would appear from the review and discussions that have taken place between our staffs that your agency should consider adopting Refined Line A as the alternative that would minimize adverse impact upon the small whorled pogonia and which would cost considerably less than other alternatives you are considering. Should you decide that this alternative satisfies your criteria, I believe my agency can support your choice of Refined Line A as the preferred alternative.

I also point out that VDACS is working cooperatively with the U. S. Fish and Wildlife Service to protect threatened and endangered plants within the state through a formal cooperative agreement. As such, you should be aware that under Section 7 of U. S. Endangered Species Act, your Department is required to formally consult with the U. S. Fish and Wildlife Service concerning any action that might adversely affect *I. medeoloides* if federal monies are involved.

If I can provide you with any further assistance, please feel free to contact me.

Sincerely,

Mason

S. Mason Carbaugh
Commissioner

cc: Mr. B. W. Southall
Mr. D. H. Kludy

[redacted] COMMISSIONER
[redacted] BRISTOL DISTRICT
[redacted] ROANOKE, SALEM DISTRICT
JAMES L. DAVIDSON, JR., LYNCHBURG, LYNCHBURG DISTRICT
[redacted] RICHMOND, RICHMOND DISTRICT
[redacted] VIRGINIA BEACH, SUFFOLK DISTRICT
[redacted] WEEMS, FREDERICKSBURG DISTRICT
CONSTANCE R. KINCHELOE, CULPEPER, CULPEPER DISTRICT
ROBERT W. SMALLEY, BERRYVILLE, STAUNTON DISTRICT
[redacted] ALEXANDRIA, NORTHERN VIRGINIA DISTRICT
[redacted] NEWPORT NEWS, AT-LARGE URBAN
ROBERT A. QUICKE, BLACKSTONE, AT-LARGE RURAL

H. M. SHAVER, JR
STATE LOCATION AND DESIGN ENGINEER

COMMONWEALTH of VIRGINIA

DEPARTMENT OF HIGHWAYS & TRANSPORTATION
1221 EAST BROAD STREET
RICHMOND, 23219

OSCAR K. MABRY
DEPUTY COMMISSIONER
J. M. WRAY, JR
CHIEF ENGINEER
ALBERT W. COATES, JR
ASSISTANT COMMISSIONER
JACK HODGE
DIRECTOR OF ENGINEERING
BALLY H. COOPER
DIRECTOR OF RAIL AND PUBLIC TRANSPORTATION
J. G. RIPLEY
DIRECTOR OF PLANNING AND PROGRAMMING
[redacted]
DIRECTOR OF FINANCE
[redacted]
DIRECTOR OF OPERATIONS

October 16, 1986

HARLAND BARTHOLOMEW AND ASSOCIATES
RECEIVED
OCT 22 1986
RICHMOND, VA.

RECEIVED
OCT 20 1986
ENVIRONMENTAL
QUALITY DIV.

Route 199
Proj. 0199-965-101, PE-100
Fed. Proj. F-126-1(101)
James City and York Counties
Fr: Int. Route 5 (S.W. of Williamsburg
To: Int. I-64 (Exit 55 - Route 646)

Location Approval

Memorandum

To: Mr. C. A. Nash, Jr.

Today the State Highway and Transportation Board approved the location corridor for Route 199 defined as Line A Revised in James City County and Line A-2 in York County.

Line A-2 Revised crosses Route 615 on proposed Line A-1 and swings to more closely follow Line A through the area of the endangered plant.

The Board also approved through access for Strawberry Plains Road (Route 616), a relocation of Route 658 to connect with Route 612 and additional access for the Route 658 relocation to proposed Route 199. Further studies and actions will be conducted as deemed appropriate for funding and public involvement for the relocation of Route 658.

The location and other features were approved as presented at the hearing as Line A in James City County.

In York County Line A-2 was approved as presented at the public hearing with one access point near the midway point between Route 60 and Route 64.

Please advise those who spoke or wrote concerning the project and the appropriate local officials of this action.

TRANSPORTATION – AMERICA'S LIFELINES

I am sending 100 copies of a map showing the approved corridor.

H. M. Shaver, Jr., State
Location and Design Engineer

MAB/jw
cc:
Mr. R. L. Hundley
Mr. R. C. Lockwood
Mr. G. W. Alexander
Mr. D. D. Harris
Mr. R. A. Mannell
Mr. F. B. Bales
Mr. R. E. Atherton
Mr. M. A. Bowyer

United States Department of the Interior

FISH AND WILDLIFE SERVICE
DIVISION OF ECOLOGICAL SERVICES
1825B VIRGINIA STREET
ANNAPOLIS, MARYLAND 21401

November 7, 1986

Mr. James M. Tumlin
Division Administrator
Federal Highway Administration
400 N. 8th Street
P. O. Box 10045
Richmond, Virginia 23240

Dear Mr. Tumlin:

This responds to your letter of October 10, 1986, to Mr. Stephen Parry of our Regional Office, requesting Fish and Wildlife Service review of your Biological Assessment of the impacts of proposed Route 199, in James City and York Counties, Virginia, on the endangered small-whorled pogonia.

Our review indicates that your Biological Assessment is a very well written document. We concur with your conclusion that selection of Revised Line A together with implementation of the four mitigative measures specified in the Biological Assessment will minimize impacts to the small-whorled pogonia.

Thank you for coordinating with us.

Sincerely yours,

G. A. Mace

for Glenn Kinser
Supervisor
Annapolis Field Office

Appendix E

Virginia Department of Transportation

Road and Bridge Specifications

Section 107.14(b)3 Noise Control

VIRGINIA DEPARTMENT OF TRANSPORTATION

ROAD AND BRIDGE SPECIFICATIONS

SECTION 107.14 (b) 3 NOISE

Rev. 6-20-85
Rev. 4-6-88

The Contractor's operations shall be performed in such a manner that the exterior noise levels measured at the closest point to a noise sensitive activity shall not exceed 80 dB(A) during periods of such activity. Noise sensitive activity is defined as any activity for which lowered noise levels are essential if such activity is to serve its intended purpose. Noise sensitive activities include, but are not limited to, those associated with residences, hospitals, nursing homes, churches, schools, libraries, parks and recreational areas.

The Department reserves the right to monitor construction related noise as deemed necessary. In the event construction noise levels exceed the criteria herein, the Contractor shall take such action as necessary to conform before proceeding with operations. The Contractor shall be responsible for all costs associated with the abatement of construction noise and with the delay of operations due to non-compliance with these requirements.

The Department reserves the right to prohibit or restrict to certain portions of the project any work which produces objectionable noise during normal sleeping hours, 10 p.m. to 6 a.m., unless other hours are established by local ordinance in which case the local ordinance shall govern.

Equipment shall in no way be altered so as to result in noise levels which are greater than those produced by the original equiprnent.

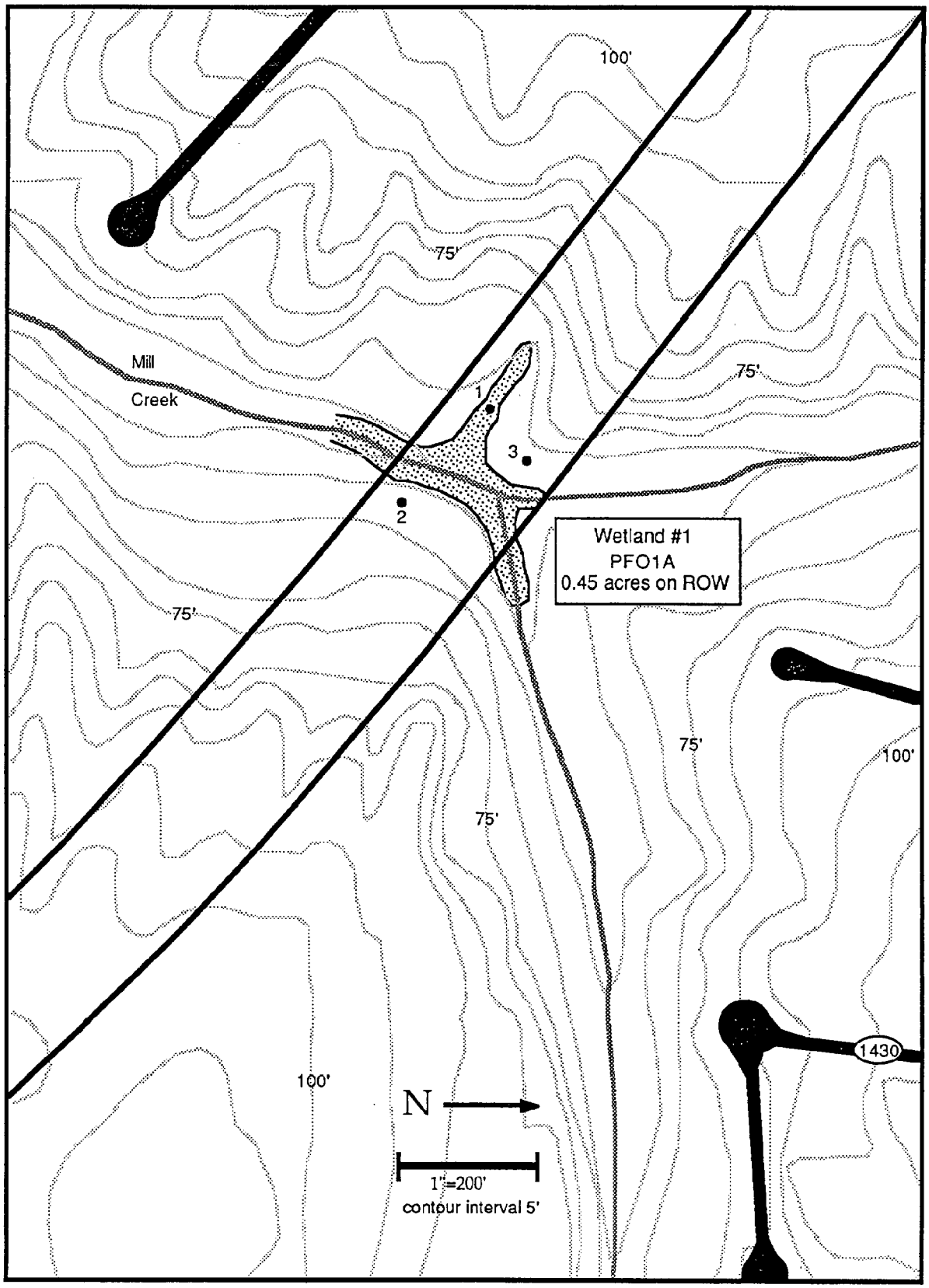
When feasible, the Contractor shall establish haul routes which direct his vehicles away from developed areas and ensure that noise from hauling operations is kept to a minimum.

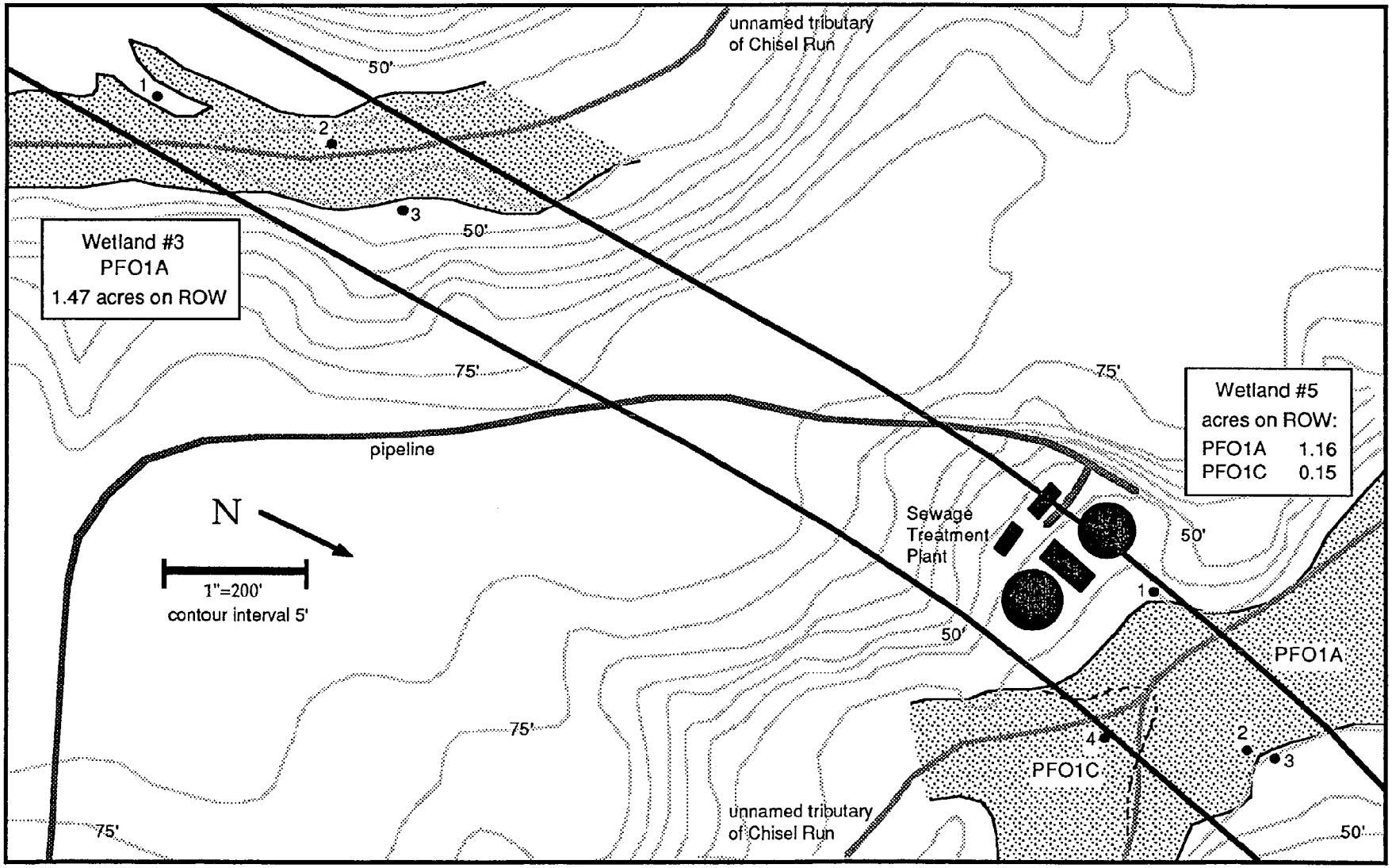
These requirements are not applicable if the ambient noise (noise produced by sources other than the Contractor's operation) at the point of reception is greater than the noise from the Contractor's operation at the same point.

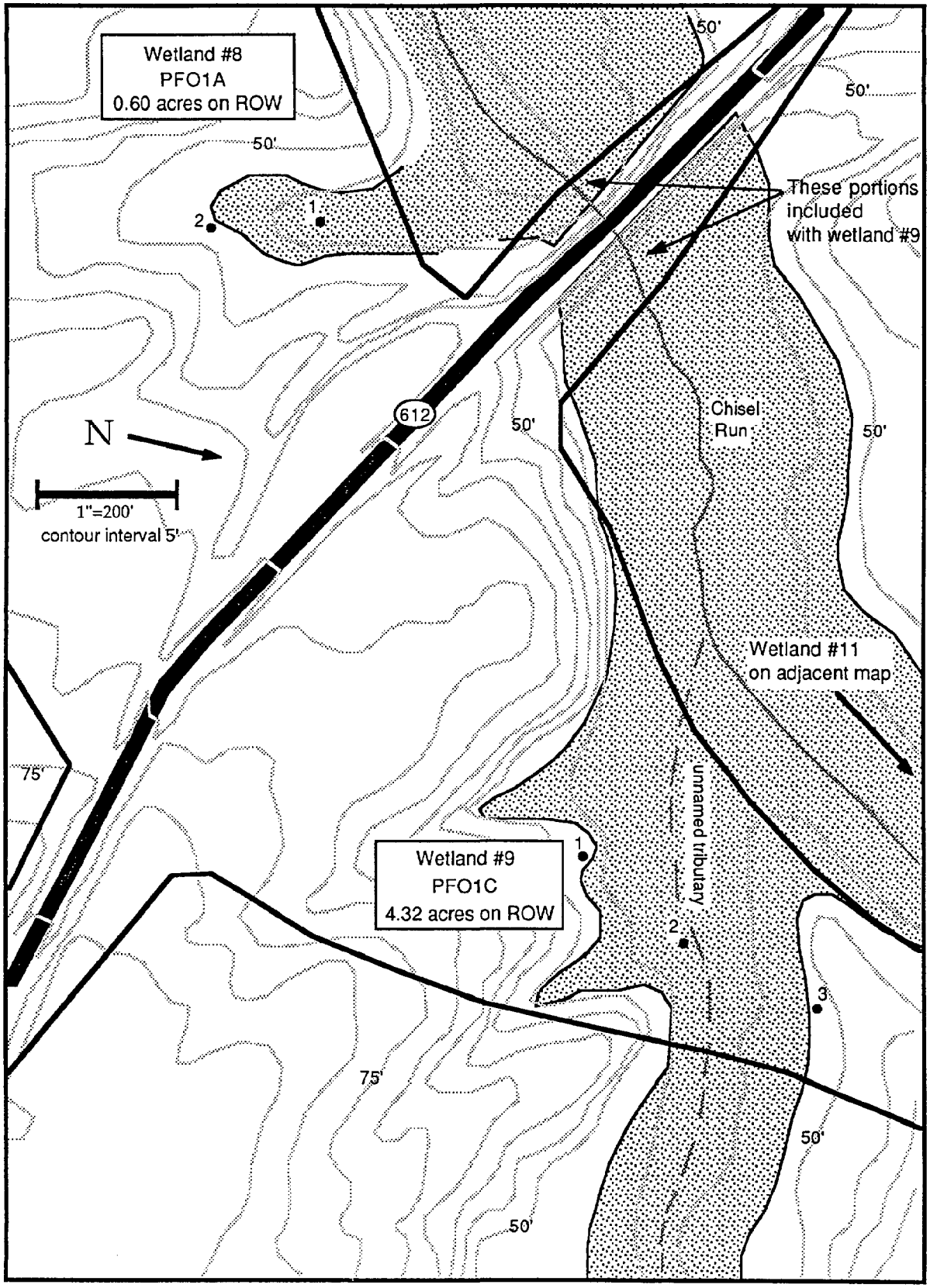
Appendix F

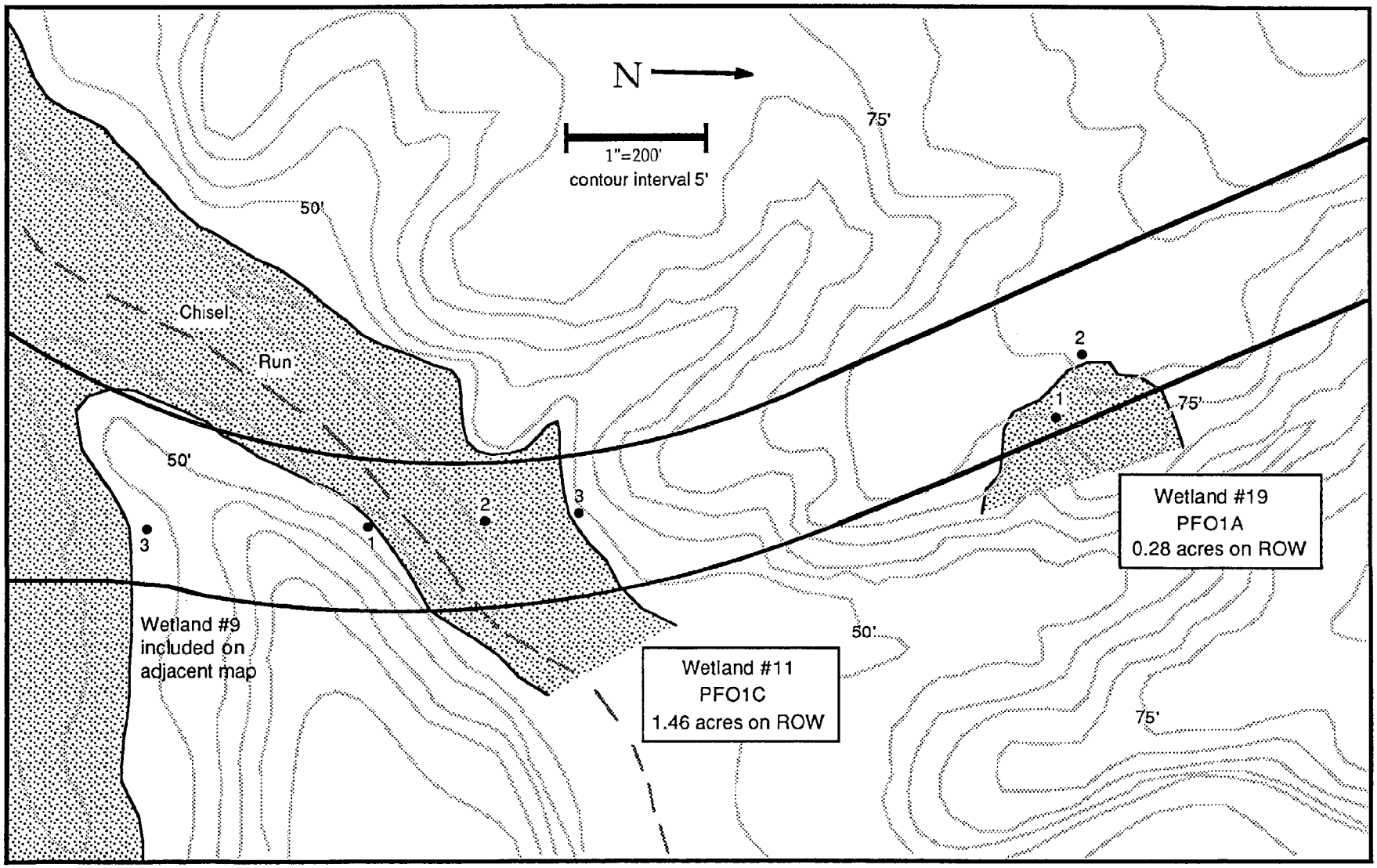
Wetlands Delineations for the Selected Alignment

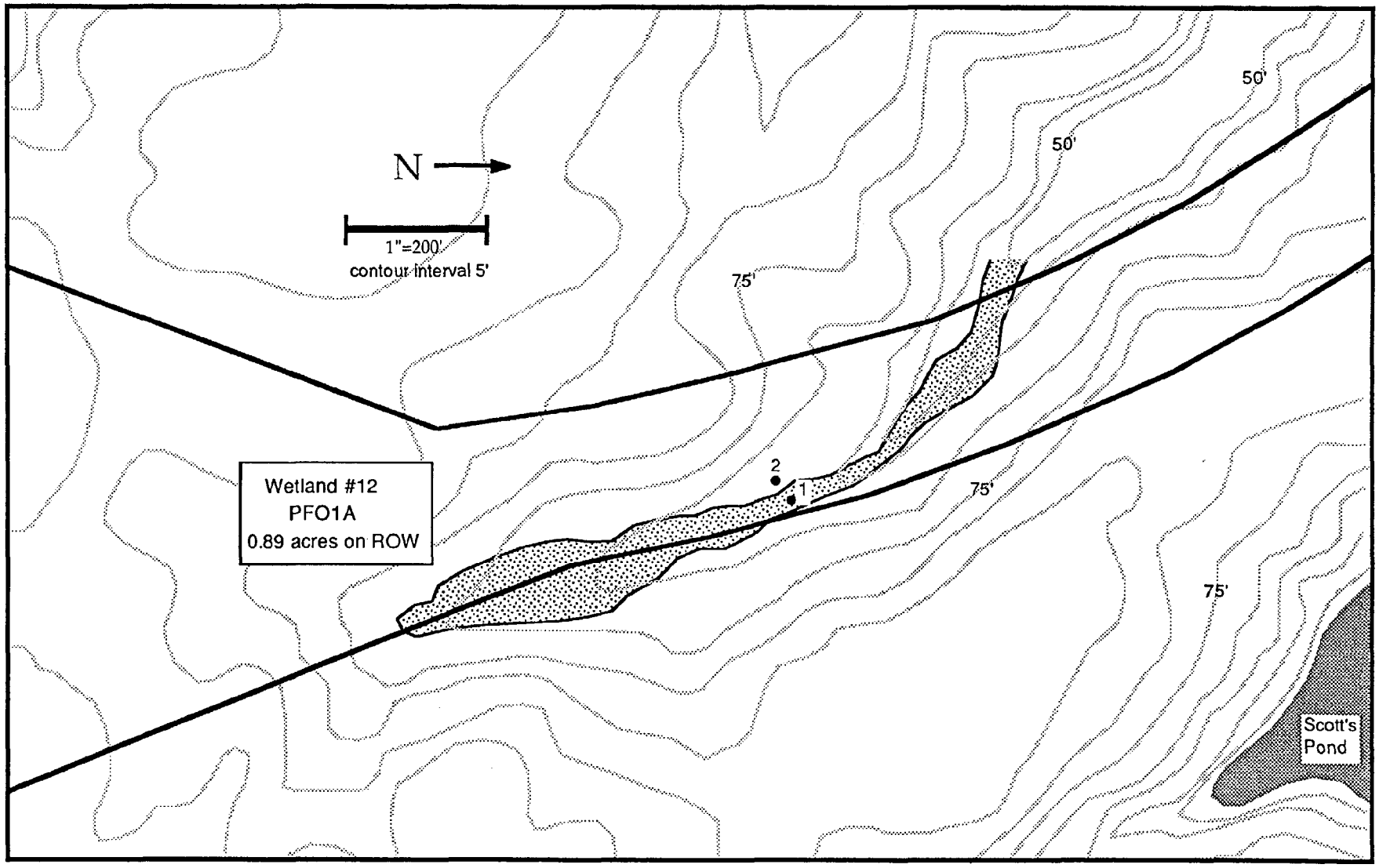
Site #	Wetland Type	Acres on ROW	Stream	Watershed	Comments
1	PFO1A	0.45	Mill Creek	Mill Creek	alluvial flat adj. to stream, small portion is filled
3	PFO1A	1.47	unnamed trib.	Chisel Run	alluvial flat adj. to stream
5	PFO1A PFO1C	1.16 0.15	unnamed trib.	Chisel Run	alluvial terrace adj. to stream inundated alluvial terrace adj. to stream
8	PFO1A	0.60	unnamed trib.	Chisel Run	possibly old pond
9	PFO1C	4.32	unnamed trib.	Chisel Run	floodplain terrace
11	PFO1C	1.46	Chisel Run	Chisel Run	floodplain
12	PFO1A	0.89	unnamed trib.	Long Hill Swamp	alluvial terrace and seepage slopes adj. to stream
13	PFO1Hb	1.08	Long Hill Swamp	Long Hill Swamp	beaver impounded alluvial terrace
14	PSS1C	0.31	unnamed trib.	Long Hill Swamp	swampy, young woodland adj. to stream
19	PFO1A	0.28	unnamed trib.	Chisel Run	seepage slope above stream, perched on sandy clay loam
	Total=	**12.17**			
	PFO=	11.86			
	PSS=	0.31			
The following wetlands are located along a proposed interchange spur. They were delineated, but are not considered in the current project.					
15	PFO1A	0.34	unnamed trib.	Chisel Run	not currently involved, Monticello Ave. extension
17	PFO1A	0.50	unnamed trib.	Chisel Run	not currently involved, Monticello Ave. extension
	Total=	0.84			

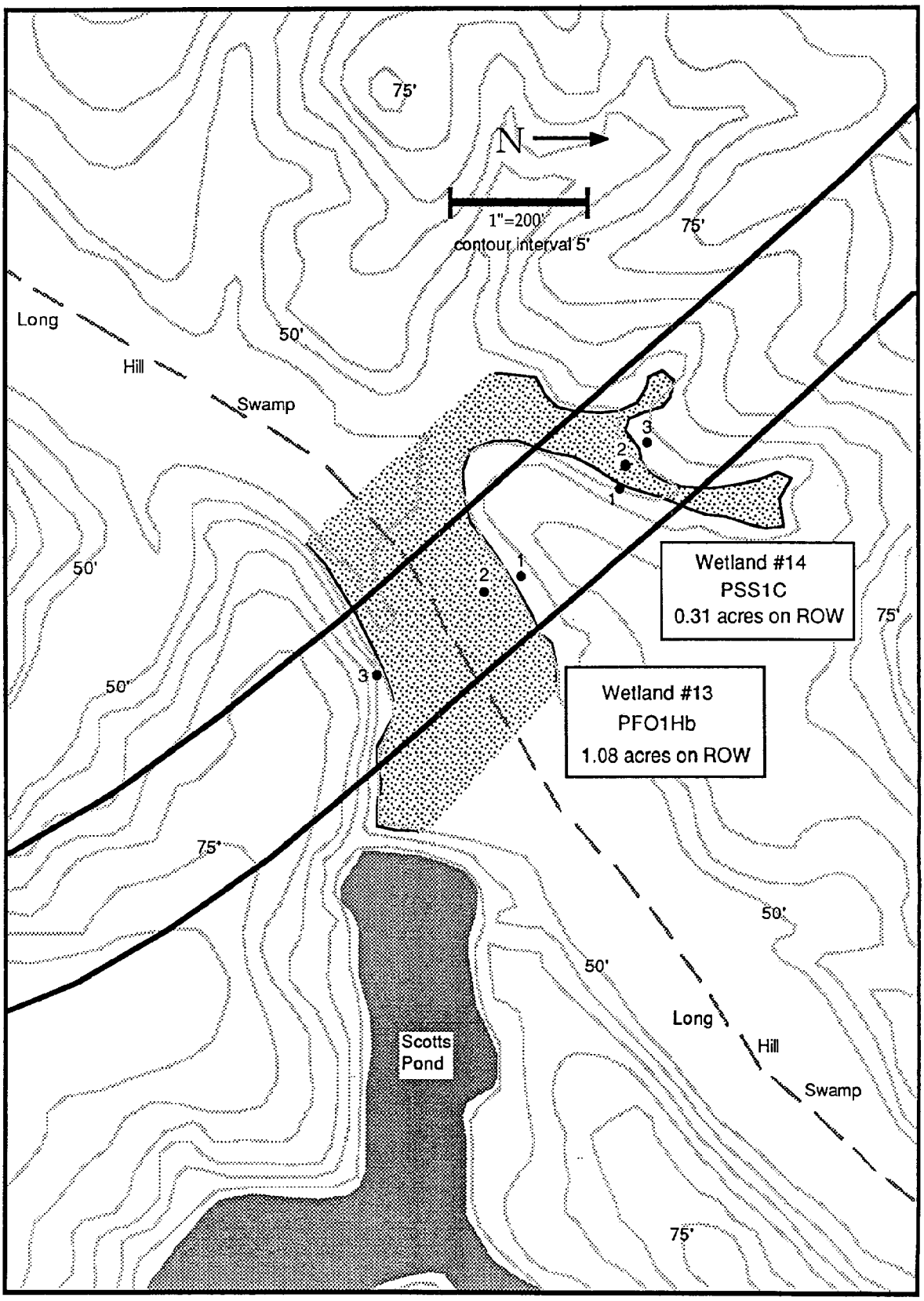

100'
75'
Mill
Creek
75'
1
3
2
Wetland #1
PFO1A
0.45 acres on ROW
75'
75'
100'
75'
1430
100'
N
1"=200'
contour interval 5'

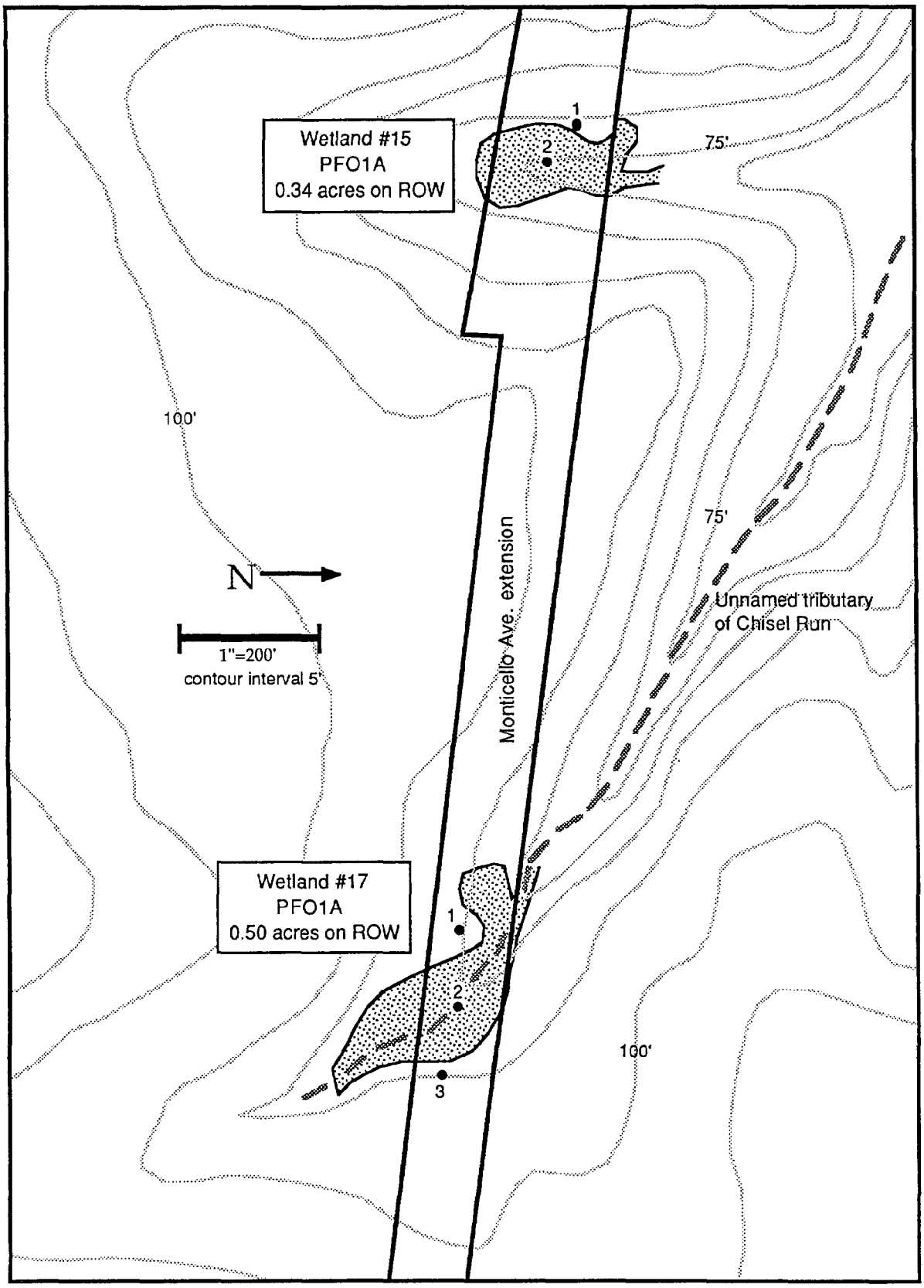

unnamed tributary
of Chisel Run
50'
1
2
3
50'
Wetland #3
PFO1A
1.47 acres on ROW
75'
75'
Wetland #5
acres on ROW:
PFO1A 1.16
PFO1C 0.15
pipeline
N
1"=200'
contour interval 5'
Sewage
Treatment
Plant
50'
1
50'
PFO1A
75'
4
2
3
PFO1C
unnamed tributary
of Chisel Run
75'
50'


Wetland #8
PFO1A
0.60 acres on ROW
50'
50'
50'
1
2
These portions
included
with wetland #9
612
50'
Chisel
Run
50'
N
1"=200'
contour interval 5'
Wetland #11
on adjacent map
75'
unnamed tributary
Wetland #9
PFO1C
4.32 acres on ROW
1
2
3
75'
50'
50'


N
1"=200'
contour interval 5'
75'
50'
Chisel
Run
50'
3
1
2
3
Wetland #9
included on
adjacent map
Wetland #11
PFO1C
1.46 acres on ROW
50'
75'
2
1
75'
Wetland #19
PFO1A
0.28 acres on ROW


N
1"=200'
contour interval 5'
50'
50'
75'
75'
75'
2
1
Wetland #12
PFO1A
0.89 acres on ROW
Scott's
Pond


75'
N
1"=200'
contour interval 5'
75'
Long
Hill
Swamp
50'
3
2
1
Wetland #14
PSS1C
0.31 acres on ROW
75'
50'
2
1
3
Wetland #13
PFO1Hb
1.08 acres on ROW
50'
75'
50'
50'
Long
Hill
Swamp
Scotts
Pond
75'


Wetland #15
PFO1A
0.34 acres on ROW
1
2
75'
100'
75'
N
1"=200'
contour interval 5'
Monticello Ave. extension
Unnamed tributary
of Chisel Run
Wetland #17
PFO1A
0.50 acres on ROW
1
2
3
100'

VDOT
AQUATIC ECOLOGY WETLANDS DETERMINATION
TECHNICAL DATA FORM 1-2888

DATE: 26 Apr 1988 COUNTY: James City

LOCATION: 199-01 STREAM: Unnamed tributary

PLOT: 01 DRAINAGE BASIN: mill Creek

ELEVATION: ≈ 55 ft FWS CLASSIFICATION: PFO1A

SITE DESCRIPTION: Alluvial plain along small, headwater stream channel & low gradient

I. VEGETATION: LIST THE THREE DOMINANT SPECIES IN EACH VEGETATION LAYER.(FIVE If only one or two layers, list the five dominant.)
STRATA=T(TREES), S(SHRUB), H(HERBS), OR V(VINES).

STRATA/SPECIES	INDICATOR STATUS	PERCENT TOTAL
1. T) Liriodendron tulipifera	FACU-	05
2. Acer rubrum	FAC	10
3. Fraxinus pennsylvanica	FACW	20
4. S) Lindera benzoin	FACW-	10
5. Leucothoe racemosa	FACW	05
6. y Fraxinus pennsylvanica	FACW	05
7. H) Senecio aureus	FACW	05
8. Osmunda cinnamomea	FACW	10
9. Saururus cernuus	OBL	05
10. V) Decumaria barbara	OBL	< 05
11. Toxicodendron radicans	FAC	< 05
12. Lonicera japonica	FAC-	05
PERCENT OF NONWETLAND SPECIES:	8.7%	
PERCENT OF WETLAND SPECIES:	91.3%	

CLASSIFICATION: WETLAND VEGETATION? ✓ YES ____ NO Prevalence BASIS

*01-1

VDOT
TECHNICAL DATA FORM 1-2888.

II. HYDROLOGY

ACTUAL 30 DAY RAINFALL: _____ AVERAGE 30 DAY RAINFALL: _____

INUNDATED? _____ YES ✓ NO. DEPTH OF WATER: —

SATURATED SOILS? _____ YES ✓ NO. METHOD USED: Observation

OTHER INDICATORS: Some saturated soils; crayfish holes; narrow channels

CLASSIFICATION: WETLANDS HYDROLOGY ✓ YES _____ NO Flooding BASIS

III. SOILS

SERIES: _____ TEXTURE(26CM DEPTH): Loamy sand

MOTTLES: _____ YES ✓ NO. MOTTLE COLOR: —

GLEYING: _____ YES ✓ NO.

SERIES ON HYDRIC SOILS LIST: _____ YES _____ NO.

MATRIX COLOR (26CM DEPTH): 7.5yr 2/0

OTHER INDICATORS: _____

CLASSIFICATION: WETLANDS SOILS ✓ YES _____ NO Low Chroma BASIS

IV. WETLANDS DETERMINATION: ✓ YES _____ NO 3+ parameters BASIS

ATYPICAL SITUATION: _____ YES ✓ NO.

COMMENTS:

DETERMINATION MADE BY:

David M. Dowmand

VDOT
AQUATIC ECOLOGY WETLANDS DETERMINATION
TECHNICAL DATA FORM 1-2888

DATE: 26 April 1988 COUNTY: James City

LOCATION: 199-01 STREAM: Unnamed Tributary

PLOT: 02 DRAINAGE BASIN: Mill Creek

ELEVATION: ≈ 55 ft FWS CLASSIFICATION: —

SITE DESCRIPTION: Filled area adjacent and to the south of alluvial plain.

I. VEGETATION: LIST THE THREE DOMINANT SPECIES IN EACH VEGETATION LAYER.(FIVE If only one or two layers, list the five dominant.)
STRATA=T(TREES), S(SHRUB), H(HERBS), OR V(VINES).

STRATA/SPECIES	INDICATOR STATUS	PERCENT TOTAL
1. Original plants covered		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		

PERCENT OF NONWETLAND SPECIES: _____

PERCENT OF WETLAND SPECIES: _____

CLASSIFICATION: WETLAND VEGETATION? _____YES _____NO _____BASIS

#01-2

VDOT
TECHNICAL DATA FORM 1-2888.

II. HYDROLOGY

ACTUAL 30 DAY RAINFALL:_____ AVERAGE 30 DAY RAINFALL:_____

INUNDATED? _____YES _____NO. DEPTH OF WATER:_____

SATURATED SOILS? _____YES _____NO. METHOD USED:_____

OTHER INDICATORS: Original hydrology lost

CLASSIFICATION: WETLANDS HYDROLOGY_____ YES _____NO _____BASIS

III. SOILS

SERIES:_____ TEXTURE(26CM DEPTH):_____

MOTTLES:_____YES _____NO. MOTTLE COLOR:_____

GLEYING:_____YES _____NO.

SERIES ON HYDRIC SOILS LIST:_____YES _____NO.

MATRIX COLOR (26CM DEPTH):_____

OTHER INDICATORS: Original soils covered

CLASSIFICATION: WETLANDS SOILS _____YES _____NO _____BASIS

IV. WETLANDS DETERMINATION: _____YES _____NO _____BASIS

ATYPICAL SITUATION: _____YES _____NO.

COMMENTS:

DETERMINATION MADE BY:

David M DuMond

DATA FORM 3

ATYPICAL SITUATIONS

Applicant Name: VDOT

Application Number:

Project Name: Rt 199

Location: 199-01

Plot Number: 02

Date: 26 Apr 1988

A. VEGETATION:

1. Type of Alteration: Filling

2. Effect on Vegetation: Covered

3. Previous Vegetation: Probably floodplain
(Attach documentation)

4. Hydrophytic Vegetation? Yes ____ No ✓.

B. SOILS:

1. Type of Alteration: Covered

2. Effect on Soils: Filled

3. Previous Soils: Possibly floodplain
(Attach documentation)

4. Hydric Soils? Yes ____ No ✓.

C. HYDROLOGY:

1. Type of Alteration: Filled

2. Effect on Hydrology: Covered

3. Previous Hydrology: Possibly flood plain
(Attach documentation)

4. Wetland Hydrology? Yes ____ No ✓.

Characterized By: David M. DuMond

VDOT
AQUATIC ECOLOGY WETLANDS DETERMINATION
TECHNICAL DATA FORM 1-2888

DATE: 26 April 1988 COUNTY: James City

LOCATION: 199-01 STREAM: Unnamed Tributary

PLOT: 03 DRAINAGE BASIN: Mill Creek

ELEVATION: ≈55 ft FWS CLASSIFICATION: –

SITE DESCRIPTION: Upland adjacent to floodplain

I. VEGETATION: LIST THE THREE DOMINANT SPECIES IN EACH VEGETATION LAYER.(FIVE If only one or two layers, list the five dominant.)
STRATA=T(TREES), S(SHRUB), H(HERBS), OR V(VINES).

STRATA/SPECIES	INDICATOR STATUS	PERCENT TOTAL
1. T) Liriodendron tulipifera	FACU-	20%
2. Fagus grandifolia	FACU	10
3. Quercus rubra	FACU-	05
4. S) y Quercus alba	—	05
5. y Fagus grandifolia	FACU	05
6. Asimina parviflora	—	10
7. H) Smilacina racemosa	FACU-	05
8. Polystichum acrostichoides	–	05
9. Woodwardia areolata	FACW+	05
10. V) Smilax rotundifolia	FAC	<05
11. Decumaria barbara	OBL	<05
12. Lonicera japonica	FAC	<05
PERCENT OF NONWETLAND SPECIES:	66.8	
PERCENT OF WETLAND SPECIES:	33.2%	

CLASSIFICATION: WETLAND VEGETATION? ____ YES ✓ NO No prevalence BASIS

#01-3

VDOT
TECHNICAL DATA FORM 1-2888.

II. HYDROLOGY

ACTUAL 30 DAY RAINFALL: _____ AVERAGE 30 DAY RAINFALL: _____

INUNDATED? _____ YES ✓ NO. DEPTH OF WATER: –

SATURATED SOILS? _____ YES ✓ NO. METHOD USED: –

OTHER INDICATORS: –

CLASSIFICATION: WETLANDS HYDROLOGY _____ YES ✓ NO _____ BASIS

III. SOILS

SERIES: _____ TEXTURE(26CM DEPTH): Coarse loamy sand

MOTTLES: ✓ YES _____ NO. MOTTLE COLOR: 10yr 7/3

GLEYING: _____ YES ✓ NO.

SERIES ON HYDRIC SOILS LIST: _____ YES ✓ NO.

MATRIX COLOR (26CM DEPTH): 7.5yr 5/8

OTHER INDICATORS: _____

CLASSIFICATION: WETLANDS SOILS _____ YES ✓ NO _____ BASIS

IV. WETLANDS DETERMINATION: _____ YES ✓ NO 0 of parameters BASIS

ATYPICAL SITUATION: _____ YES ✓ NO.

COMMENTS:

DETERMINATION MADE BY: David M. DeMarco

VDOT
AQUATIC ECOLOGY WETLANDS DETERMINATION
TECHNICAL DATA FORM 1-2888

DATE: 26 April 1988 COUNTY: James City

LOCATION: 199-3 STREAM: Unnamed Tributary

PLOT: 01 DRAINAGE BASIN: Chisel Run

ELEVATION: ≈45 ft FWS CLASSIFICATION: —

SITE DESCRIPTION: Upland adjacent to alluvial plain

I. VEGETATION: LIST THE THREE DOMINANT SPECIES IN EACH VEGETATION LAYER.(FIVE If only one or two layers, list the five dominant.)
STRATA=T(TREES), S(SHRUB), H(HERBS), OR V(VINES).

STRATA/SPECIES	INDICATOR STATUS	PERCENT TOTAL
1. T) Quercus alba	—	10
2. Fagus grandifolia	FACU	15
3. Liriodendron tulipifera	FACU-	05
4. S) Carpinus caroliniana	FAC	05
5. y Fagus grandifolia	FACU	<05
6. y Liquidambar styraciflua	FAC	<05
7. H) Thelypteris noveboracensis	FAC	<05
8. Pteridium aquilinum	FACU	<05
9. V) Smilax rotundifolia	FAC	<05
10. Lonicera japonica	FAC	<05
11.		
12.		

PERCENT OF NONWETLAND SPECIES: 50%

PERCENT OF WETLAND SPECIES: 50%

CLASSIFICATION: WETLAND VEGETATION? ____ YES ✓ NO Nonwetland BASIS

#03-1

VDOT
TECHNICAL DATA FORM 1-2888.

II. HYDROLOGY

ACTUAL 30 DAY RAINFALL: _____ AVERAGE 30 DAY RAINFALL: _____

INUNDATED? _____ YES ✓ NO. DEPTH OF WATER: —

SATURATED SOILS? _____ YES ✓ NO. METHOD USED: —

OTHER INDICATORS: —

CLASSIFICATION: WETLANDS HYDROLOGY _____ YES ✓ NO — BASIS

III. SOILS

SERIES: — TEXTURE(26CM DEPTH): Sand

MOTTLES: _____ YES ✓ NO. MOTTLE COLOR: —

GLEYING: _____ YES ✓ NO.

SERIES ON HYDRIC SOILS LIST: _____ YES ✓ NO.

MATRIX COLOR (26CM DEPTH): 10yr 7/3

OTHER INDICATORS: —

CLASSIFICATION: WETLANDS SOILS _____ YES ✓ NO — BASIS

IV. WETLANDS DETERMINATION: _____ YES ✓ NO 0+ parameters BASIS

ATYPICAL SITUATION: _____ YES ✓ NO.

COMMENTS:

DETERMINATION MADE BY:

David M. Dumond

VDOT
AQUATIC ECOLOGY WETLANDS DETERMINATION
TECHNICAL DATA FORM 1-2868

DATE: 26 April 1988 COUNTY: James City

LOCATION: 199-3 STREAM: Unnamed Tributary

PLOT: 02 DRAINAGE BASIN: Chisel Run

ELEVATION: ±45 ft FWS CLASSIFICATION: PFO1A

SITE DESCRIPTION: stream and low gradient alluvial plain

I. VEGETATION: LIST THE THREE DOMINANT SPECIES IN EACH VEGETATION LAYER.(FIVE If only one or two layers, list the five dominant.)
STRATA=T(TREES), S(SHRUB), H(HERBS), OR V(VINES).

STRATA/SPECIES	INDICATOR STATUS	PERCENT TOTAL
1. T) Ulmus americana	FACW-	05
2. Acer rubrum	FAC	15
3. Fraxinus pennsylvanica	FACW	15
4. S) Corylus americana	—	05
5. Lindera benzoin	FACW-	20
6. Asimina parviflora	—	05
7. V) Smilax rotundifolia	FAC	<05
8. Bignonia capreolata	—	<05
9. Lonicera japonica	FAC	10
10. H) Arisaema triphyllum	FACW-	10
11. Polystichum acrostichoides	—	10
12. Cardamine bulbosa	OBL	05

PERCENT OF NONWETLAND SPECIES: 33.6

PERCENT OF WETLAND SPECIES: 66.4

CLASSIFICATION: WETLAND VEGETATION? ✓ YES ____ NO prevalence BASIS

#03-2

VDOT
TECHNICAL DATA FORM 1-2888.

II. HYDROLOGY

ACTUAL 30 DAY RAINFALL: _____ AVERAGE 30 DAY RAINFALL: _____

INUNDATED? _____ YES ✓ NO. DEPTH OF WATER: —

SATURATED SOILS? _____ YES ✓ NO. METHOD USED: —

OTHER INDICATORS: Channels; watermarks; crayfish chimneys

CLASSIFICATION: WETLANDS HYDROLOGY ✓ YES _____ NO Flooding BASIS

III. SOILS

SERIES: _____ TEXTURE(26CM DEPTH): silt loam

MOTTLES: _____ YES ✓ NO. MOTTLE COLOR: —

GLEYING: _____ YES ✓ NO.

SERIES ON HYDRIC SOILS LIST: _____ YES _____ NO.

MATRIX COLOR (26CM DEPTH): 10yr 3/1

OTHER INDICATORS: _____

CLASSIFICATION: WETLANDS SOILS ✓ YES _____ NO Low chroma BASIS

IV. WETLANDS DETERMINATION: ✓ YES _____ NO 3+ parameters BASIS

ATYPICAL SITUATION: _____ YES ✓ NO.

COMMENTS:

DETERMINATION MADE BY: David N. DeMond

VDOT
AQUATIC ECOLOGY WETLANDS DETERMINATION
TECHNICAL DATA FORM 1-2888

DATE: 26 April 1988 COUNTY: Jamestown

LOCATION: 199-03 STREAM: Unnamed tributary

PLOT: 03 DRAINAGE BASIN: Chisel Run

ELEVATION: ≈ 45 ft FWS CLASSIFICATION: —

SITE DESCRIPTION: Upland adjacent to alluvial plain

I. VEGETATION: LIST THE THREE DOMINANT SPECIES IN EACH VEGETATION LAYER.(FIVE If only one or two layers, list the five dominant.)
STRATA=T(TREES), S(SHRUB), H(HERBS), OR V(VINES).

STRATA/SPECIES	INDICATOR STATUS	PERCENT TOTAL
1. T) Quercus alba	—	20
2. Carya tomentosa	—	05
3. Carpinus caroliniana	FAC	05
4. S) y Quercus michauxii	FACW	05
5. Asimina parviflora	—	<05
6. y Fagus grandifolia	FACU	<05
7. V) Vitis riparia	FACW	<05
8. H) Podophyllum pellatum	—	<05
9. Polystichum acrostichoides	—	<05
10. Carex sp.	—	—
11.		
12.		

PERCENT OF NONWETLAND SPECIES: >70%

PERCENT OF WETLAND SPECIES: 30%

CLASSIFICATION: WETLAND VEGETATION? ____ YES ✓ NO Nonprevalent BASIS

#03-3

VDOT
TECHNICAL DATA FORM 1-2888.

II. HYDROLOGY

ACTUAL 30 DAY RAINFALL: _____ AVERAGE 30 DAY RAINFALL: _____

INUNDATED? _____ YES ✓ NO. DEPTH OF WATER: —

SATURATED SOILS? _____ YES ✓ NO. METHOD USED: —

OTHER INDICATORS: —

CLASSIFICATION: WETLANDS HYDROLOGY _____ YES ✓ NO _____ BASIS

III. SOILS

SERIES: _____ TEXTURE(26CM DEPTH): Loamy sand

MOTTLES: _____ YES ✓ NO. MOTTLE COLOR: ✓

GLEYING: _____ YES ✓ NO.

SERIES ON HYDRIC SOILS LIST: _____ YES ✓ NO.

MATRIX COLOR (26CM DEPTH): 10yr 3/2

OTHER INDICATORS: _____

CLASSIFICATION: WETLANDS SOILS _____ YES ✓ NO _____ BASIS

IV. WETLANDS DETERMINATION: _____ YES ✓ NO _____ BASIS

ATYPICAL SITUATION: _____ YES ✓ NO.

COMMENTS:

DETERMINATION MADE BY: David M. DeMaio

VDOT
AQUATIC ECOLOGY WETLANDS DETERMINATION
TECHNICAL DATA FORM 1-2888

DATE: 26 Apr 1988 COUNTY: James City

LOCATION: 199-05 STREAM: Unnamed Tributary

PLOT: 01 DRAINAGE BASIN: Chisel Run

ELEVATION: ± 40 ft FWS CLASSIFICATION: —

SITE DESCRIPTION: Disturbed slope above alluvial terrace along south side

I. VEGETATION: LIST THE THREE DOMINANT SPECIES IN EACH VEGETATION LAYER.(FIVE If only one or two layers, list the five dominant.)
STRATA=T(TREES), S(SHRUB), H(HERBS), OR V(VINES).

STRATA/SPECIES	INDICATOR STATUS	PERCENT TOTAL
1. Carpinus Caroliniana	FAC	05
2. Lonicera japonica	FAC-	20
3. Fraxinus americana	FACW	<05
4. Festuca rubra	FACU	20
5. Solidago sp.	—	<05
6.		
7.		
8.		
9.		
10.		
11.		
12.		

PERCENT OF NONWETLAND SPECIES: 60

PERCENT OF WETLAND SPECIES: 40

CLASSIFICATION: WETLAND VEGETATION? ____ YES ✓ NO Nonprevalence BASIS

#05-1

VDOT
TECHNICAL DATA FORM 1-2888.

II. HYDROLOGY

ACTUAL 30 DAY RAINFALL: _____ AVERAGE 30 DAY RAINFALL: _____

INUNDATED? _____ YES ✓ NO. DEPTH OF WATER: —

SATURATED SOILS? _____ YES ✓ NO. METHOD USED: —

OTHER INDICATORS: _____

CLASSIFICATION: WETLANDS HYDROLOGY _____ YES ✓ NO _____ BASIS

III. SOILS

SERIES: _____ TEXTURE(26CM DEPTH): Loamy sand

MOTTLES: _____ YES ✓ NO. MOTTLE COLOR: _____

GLEYING: _____ YES ✓ NO.

SERIES ON HYDRIC SOILS LIST: _____ YES ✓ NO.

MATRIX COLOR (26CM DEPTH): 10yr 6/8

OTHER INDICATORS: _____

CLASSIFICATION: WETLANDS SOILS _____ YES ✓ NO _____ BASIS

IV. WETLANDS DETERMINATION: _____ YES ✓ NO 0+ parameters BASIS

ATYPICAL SITUATION: _____ YES ✓ NO.

COMMENTS:

DETERMINATION MADE BY: David H. DeMond

VDOT
AQUATIC ECOLOGY WETLANDS DETERMINATION
TECHNICAL DATA FORM 1-2888

DATE: 26 Apr 1988 COUNTY: James City

LOCATION: 199-05 STREAM: Unnamed Tributary

PLOT: 02 DRAINAGE BASIN: Chisel Run

ELEVATION: ≈40 ft FWS CLASSIFICATION: PFO1A

SITE DESCRIPTION: Unflooded low gradient alluvial terrace

I. VEGETATION: LIST THE THREE DOMINANT SPECIES IN EACH VEGETATION LAYER.(FIVE If only one or two layers, list the five dominant.)
STRATA=T(TREES), S(SHRUB), H(HERBS), OR V(VINES).

STRATA/SPECIES		INDICATOR STATUS	PERCENT TOTAL
1. T)	Nyssa sylvatica	FAC	10
2.	Fraxinus pennsylvanica	FACW	20
3.	Platanus occidentalis	FACW-	20
4. S)	Lindera benzoin	FACW-	40
5.	Asimina parviflora	—	10
6.	Corylus americana	—	05
7. H)	Senecio aureus	FACW	30
8.	Claytonia virginica	—	20
9.	Glyceria striata	OBL	05
10. V)	Decumaria barbara	OBL	05
11.	Lonicera japonica	FAC-	20
12.			

PERCENT OF NONWETLAND SPECIES: 0

PERCENT OF WETLAND SPECIES: 100

CLASSIFICATION: WETLAND VEGETATION? ✓ YES ____ NO presumed BASIS

#05-2

VDOT
TECHNICAL DATA FORM 1-2888.

II. HYDROLOGY

ACTUAL 30 DAY RAINFALL: _____ AVERAGE 30 DAY RAINFALL: _____

INUNDATED? ____ YES ✓ NO. DEPTH OF WATER: —

SATURATED SOILS? ____ YES ✓ NO. METHOD USED: —

OTHER INDICATORS: channels; Crayfish chimneys, deposited debris

CLASSIFICATION: WETLANDS HYDROLOGY ✓ YES ____ NO flooding BASIS

III. SOILS

SERIES: _____ TEXTURE(26CM DEPTH): Silty sand

MOTTLES: ✓ YES ____ NO. MOTTLE COLOR: 10yr 5/2 & 10yr 5/6

GLEYING: ____ YES ✓ NO.

SERIES ON HYDRIC SOILS LIST: ✓ YES ____ NO.

MATRIX COLOR (26CM DEPTH): 10 yr 6/1

OTHER INDICATORS: _____

CLASSIFICATION: WETLANDS SOILS ✓ YES ____ NO Low Chroma BASIS

IV. WETLANDS DETERMINATION: ✓ YES ____ NO 3+ parameters BASIS

ATYPICAL SITUATION: ____ YES ✓ NO.

COMMENTS:

DETERMINATION MADE BY:

David H. DuMond

VDOT
AQUATIC ECOLOGY WETLANDS DETERMINATION
TECHNICAL DATA FORM 1-2888

DATE: 26 Apr 1988 COUNTY: James City

LOCATION: 199-05 STREAM: Unnamed Tributary

PLOT: 03 DRAINAGE BASIN: Chisel Run

ELEVATION: ≈ 40 ft FWS CLASSIFICATION: —

SITE DESCRIPTION: North boundry wetland - upland

I. VEGETATION: LIST THE THREE DOMINANT SPECIES IN EACH VEGETATION LAYER.(FIVE If only one or two layers, list the five dominant.)
STRATA=T(TREES), S(SHRUB), H(HERBS), OR V(VINES).

STRATA/SPECIES	INDICATOR STATUS	PERCENT TOTAL
1. T) Quercus rubra	FACU-	10
2. Fagus grandifolia	FACU	5
3. Pinus taeda	FAC-	<5
4. S) Asimina parviflora	—	15
5. " Fagus grandifolia	FACU	<5
6. " Liquidambar styraciflua	FAC	<5
7. H) Thelypteris noveboracensis	FAC	5
8. Dioscorea villosa	—	<5
9. V) Lonicera japonica	FAC-	<5
10.		
11.		
12.		

PERCENT OF NONWETLAND SPECIES: 77.8

PERCENT OF WETLAND SPECIES: 22.2

CLASSIFICATION: WETLAND VEGETATION? ____ YES ✓ NO Hydrology BASIS

#05-3

VDOT
TECHNICAL DATA FORM 1-2888.

II. HYDROLOGY

ACTUAL 30 DAY RAINFALL: _____ AVERAGE 30 DAY RAINFALL: _____

INUNDATED? _____ YES ✓ NO. DEPTH OF WATER: —

SATURATED SOILS? _____ YES ✓ NO. METHOD USED: —

OTHER INDICATORS: —

CLASSIFICATION: WETLANDS HYDROLOGY _____ YES ✓ NO — BASIS

III. SOILS

SERIES: _____ TEXTURE(26CM DEPTH): Sand

MOTTLES: _____ YES ✓ NO. MOTTLE COLOR: —

GLEYING: _____ YES ✓ NO.

SERIES ON HYDRIC SOILS LIST: _____ YES ✓ NO.

MATRIX COLOR (26CM DEPTH): 10yr 7/2

OTHER INDICATORS: _____

CLASSIFICATION: WETLANDS SOILS _____ YES ✓ NO No mottles BASIS

IV. WETLANDS DETERMINATION: _____ YES ✓ NO 0 ± parameters BASIS

ATYPICAL SITUATION: _____ YES ✓ NO.

COMMENTS:

DETERMINATION MADE BY:

David M. Dermond

VDOT
AQUATIC ECOLOGY WETLANDS DETERMINATION
TECHNICAL DATA FORM 1-2888

DATE: 26 Apr 1988 COUNTY: James City

LOCATION: 199-05 STREAM: Unnamed tributary

PLOT: 04 DRAINAGE BASIN: Chisel Run

ELEVATION: ≈ 40 ft FWS CLASSIFICATION: PFO1C

SITE DESCRIPTION: Flooded swampy area along alluvial terrace

I. VEGETATION: LIST THE THREE DOMINANT SPECIES IN EACH VEGETATION LAYER.(FIVE If only one or two layers, list the five dominant.)
STRATA=T(TREES), S(SHRUB), H(HERBS), OR V(VINES).

STRATA/SPECIES	INDICATOR STATUS	PERCENT TOTAL
1. T) Fraxinus pennsylvanica	FACW	40
2. Acer rubrum	FAC	10
3. Ulmus americana	FACW-	<05
4. S y Fraxinus americana	FACW	<05
5. Ilex laevigata	OBL	<05
6. Lindera benzoin	FACW	<05
7. H) Saururus cernuus	OBL	05
8. V) -		
9.		
10.		
11.		
12.		

PERCENT OF NONWETLAND SPECIES: 0

PERCENT OF WETLAND SPECIES: 100

CLASSIFICATION: WETLAND VEGETATION? ✓ YES ____ NO prevalence BASIS

#05-4

VDOT
TECHNICAL DATA FORM 1-2888.

II. HYDROLOGY

ACTUAL 30 DAY RAINFALL: _____ AVERAGE 30 DAY RAINFALL: _____

INUNDATED? ✓ YES _____ NO. DEPTH OF WATER: 0-3 inches

SATURATED SOILS? ✓ YES _____ NO. METHOD USED: observation

OTHER INDICATORS: reduced surface sediments

CLASSIFICATION: WETLANDS HYDROLOGY ✓ YES _____ NO Flooding BASIS

III. SOILS

SERIES: _____ TEXTURE(26CM DEPTH): silt loam

MOTTLES: ✓ YES _____ NO. MOTTLE COLOR: 7.5 yr 4/6

GLEYING: _____ YES ✓ NO.

SERIES ON HYDRIC SOILS LIST: ✓ YES _____ NO.

MATRIX COLOR (26CM DEPTH): 10yr 4/1

OTHER INDICATORS: _____

CLASSIFICATION: WETLANDS SOILS ✓ YES _____ NO Low chroma BASIS

IV. WETLANDS DETERMINATION: ✓ YES _____ NO 3+ parameters BASIS

ATYPICAL SITUATION: _____ YES ✓ NO.

COMMENTS:

DETERMINATION MADE BY:

David M. Dunmond

Route 199
Area # 8
Plot 01

VDOT
AQUATIC ECOLOGY WETLANDS DETERMINATION
TECHNICAL DATA FORM 1-2888

DATE: July 20, 1988 **COUNTY:** James City

LOCATION: Area #8 **STREAM:** Unnamed Tributary

PLOT: 01 **DRAINAGE BASIN:** Chisel Run

ELEVATION: 45 ft **FWS CLASSIFICATION:** PFO1A

SITE DESCRIPTION: Possibly old pond bottom on which has grown a bottomland hardwood forest

I. VEGETATION: LIST THE THREE DOMINANT SPECIES IN EACH VEGETATION LAYER.(FIVE If only one or two layers, list the five dominant.)
STRATA=T(TREES), S(SHRUB), H(HERBS), OR V(VINES).

STRATA/SPECIES	INDICATOR STATUS	PERCENT TOTAL
1. T Liquidambar styraciflua	FAC	10
2. Acer rubrum	FAC	30
3. Fraxinus pennsylvanica	FACW	15
4. S Lindera benzoin	FACW-	20
5. Asimina parviflora	—	15
6. Carpinus caroliniana	FAC	< 05
7. H Senecio aureus	FACW	20
8. Woodwardia areolata	FACW+	30
9. Glyceria striata	OBL	< 05
10. V Smilax rotundifolia	FAC	< 05
11. Lonicera japonica	FAC-	< 05
12. Decumaria barbara	OBL	< 05

PERCENT OF NONWETLAND SPECIES: 16.7

PERCENT OF WETLAND SPECIES: 83.3

CLASSIFICATION: WETLAND VEGETATION? ✓ **YES** ____ **NO** Prevalence **BASIS**

#8-1

VDOT
TECHNICAL DATA FORM 1-2888.

II. HYDROLOGY

ACTUAL 30 DAY RAINFALL: _____ AVERAGE 30 DAY RAINFALL: _____

INUNDATED? ____ YES ✓ NO. DEPTH OF WATER: —

SATURATED SOILS? ____ YES ✓ NO. METHOD USED: _____

OTHER INDICATORS: Crayfish towers, sediment, channels

CLASSIFICATION: WETLANDS HYDROLOGY ✓ YES ____ NO Flooding BASIS

III. SOILS

SERIES: _____ TEXTURE(26CM DEPTH): loamy-silty sand

MOTTLES: ____ YES ✓ NO. MOTTLE COLOR: —

GLEYING: ____ YES ✓ NO.

SERIES ON HYDRIC SOILS LIST: ____ YES ____ NO.

MATRIX COLOR (26CM DEPTH): 10yr 4/1

OTHER INDICATORS: _____

CLASSIFICATION: WETLANDS SOILS ✓ YES ____ NO low chroma BASIS

IV. WETLANDS DETERMINATION: ✓ YES ____ NO 3+ parameters BASIS

ATYPICAL SITUATION: ____ YES ✓ NO.

COMMENTS: Variable and sometimes non-hydric soils intermixed. Soil textures mixed. Possibly old pond bed, loosing hydric characteristics.

DETERMINATION MADE BY: David A. DuMond

Route 199
Area # 8
Plot 02

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VDOT

AQUATIC ECOLOGY WETLANDS DETERMINATION
TECHNICAL DATA FORM 1-2888

DATE: July 20 1988 COUNTY: James City

LOCATION: Area # 8 STREAM: Unnamed Tributary

PLOT: 02 DRAINAGE BASIN: Chisel Run

ELEVATION: ≈ 45 ft FWS CLASSIFICATION: —

SITE DESCRIPTION: Upland cove above wetland flat bottomland hardwood forest

I. VEGETATION: LIST THE THREE DOMINANT SPECIES IN EACH VEGETATION LAYER.(FIVE If only one or two layers, list the five dominant.)
STRATA=T(TREES), S(SHRUB), H(HERBS), OR V(VINES).

STRATA/SPECIES	INDICATOR STATUS	PERCENT TOTAL
1. T Liriodendron tulipifera	FACU-	20
2. Quercus michauxii	FACW	20
3. Fraxinus pennsylvanica	FACW	30
4. S Asimina parviflora	—	10
5. Lindera benzoin	FACW-	15
6. Cornus florida	FACU-	10
7. H Woodwardia areolata	FACW+	40
8. Polystichum acrostichoides	—	15
9. Athyrium asplenoides	—	10
10. V Lonicera japonica	FAC-	60
11. Parthenocissus quinquefolia	FACU	05
12. Smilax rotundifolia	FAC	<05

PERCENT OF NONWETLAND SPECIES: 58.3

PERCENT OF WETLAND SPECIES: 41.7

CLASSIFICATION: WETLAND VEGETATION? ____ YES ✓ NO Nonwetland BASIS

#8-2

VDOT
TECHNICAL DATA FORM 1-2888.

II. HYDROLOGY

ACTUAL 30 DAY RAINFALL: _____ AVERAGE 30 DAY RAINFALL: _____

INUNDATED? _____ YES ✓ NO. DEPTH OF WATER: —

SATURATED SOILS? _____ YES ✓ NO. METHOD USED: observation

OTHER INDICATORS: —

CLASSIFICATION: WETLANDS HYDROLOGY _____ YES ✓ NO No indicators BASIS

III. SOILS

SERIES: _____ TEXTURE(26CM DEPTH): Sand

MOTTLES: _____ YES ✓ NO. MOTTLE COLOR: —

GLEYING: _____ YES ✓ NO.

SERIES ON HYDRIC SOILS LIST: _____ YES ✓ NO.

MATRIX COLOR (26CM DEPTH): 2.5y 6/4

OTHER INDICATORS: —

CLASSIFICATION: WETLANDS SOILS _____ YES ✓ NO high chroma BASIS

IV. WETLANDS DETERMINATION: _____ YES ✓ NO 0+ parameter BASIS

ATYPICAL SITUATION: _____ YES ✓ NO.

COMMENTS:

DETERMINATION MADE BY:

David M. DeMond

VDOT
AQUATIC ECOLOGY WETLANDS DETERMINATION
TECHNICAL DATA FORM 1-2888

DATE: 27 April 1988 COUNTY: James City

LOCATION: 199-09 STREAM: Unnamed Tributary

PLOT: 01 DRAINAGE BASIN: Chisel Run

ELEVATION: ≈ 43 FT FWS CLASSIFICATION: —

SITE DESCRIPTION: Uplands adjacent on south side.

I. VEGETATION: LIST THE THREE DOMINANT SPECIES IN EACH VEGETATION LAYER.(FIVE If only one or two layers, list the five dominant.)
STRATA=T(TREES), S(SHRUB), H(HERBS), OR V(VINES).

STRATA/SPECIES	INDICATOR STATUS	PERCENT TOTAL
1. T) Fagus grandifolia	FACU	30
2. Liquidambar styraciflua	FAC	10
3. Nyssa sylvatica	FAC	10
4. S) y Cornus florida	FACU-	10
5. y Fagus grandifolia	FACU	10
6. y Quercus alba	—	10
7. H) Athyrium asplenioides	—	10
8. Woodwardia areolata	FACW+	10
9. Lonicera echinata	FACU	<05
10. V) Smilax rotundifolia	FAC	<05
11.		
12.		

PERCENT OF NONWETLAND SPECIES: 60%

PERCENT OF WETLAND SPECIES: 40%

CLASSIFICATION: WETLAND VEGETATION? ____ YES ✓ NO Nonwetland BASIS

#09-1

VDOT
TECHNICAL DATA FORM 1-2888.

II. HYDROLOGY

ACTUAL 30 DAY RAINFALL: _____ AVERAGE 30 DAY RAINFALL: _____

INUNDATED? _____YES ✓ NO. DEPTH OF WATER: —

SATURATED SOILS? _____YES ✓ NO. METHOD USED: —

OTHER INDICATORS: —

CLASSIFICATION: WETLANDS HYDROLOGY _____ YES _____ NO _____ BASIS

III. SOILS

SERIES: _____ TEXTURE(26CM DEPTH): loamy sand

MOTTLES: ✓ YES _____ NO. MOTTLE COLOR: 10yr 5/2

GLEYING: _____YES ✓ NO.

SERIES ON HYDRIC SOILS LIST: _____YES _____NO.

MATRIX COLOR (26CM DEPTH): 10yr 5/6

OTHER INDICATORS: —

CLASSIFICATION: WETLANDS SOILS _____YES ✓ NO high chroma BASIS

IV. WETLANDS DETERMINATION: _____YES ✓ NO 0+ parameters BASIS

ATYPICAL SITUATION: _____YES ✓ NO.

COMMENTS:

DETERMINATION MADE BY: David M. DeMond

VDOT
AQUATIC ECOLOGY WETLANDS DETERMINATION
TECHNICAL DATA FORM 1-2888

DATE: 27 April 1988 COUNTY: James City

LOCATION: 199-09 STREAM: Unnamed Tributary

PLOT: 02 DRAINAGE BASIN: Chisel Run

ELEVATION: ≈ 43 ft FWS CLASSIFICATION: PFO1C

SITE DESCRIPTION: Floodplain Terrace.

I. VEGETATION: LIST THE THREE DOMINANT SPECIES IN EACH VEGETATION LAYER.(FIVE If only one or two layers, list the five dominant.)
STRATA=T(TREES), S(SHRUB), H(HERBS), OR V(VINES).

STRATA/SPECIES	INDICATOR STATUS	PERCENT TOTAL
1. T) Nyssa sylvatica	FAC	05
2. Fraxinus pennsylvanica	FACW	30
3. Acer rubrum	FAC	10
4. S) y Fraxinus pennsylvanica)	FACW	20
5. Lindera benzoin	FACW-	20
6. y Magnolia virginiana)	FACW+	05
7. H) Senecio aureus	FACW	25
8. Saururus cernuus	OBL	05
9. Woodwardia areolata	FACW+	20
10. ✓ Decumaria barbara	OBL	05
11.		
12.		

PERCENT OF NONWETLAND SPECIES: 0%

PERCENT OF WETLAND SPECIES: 100%

CLASSIFICATION: WETLAND VEGETATION? ✓ YES ___ NO prevalence BASIS

#09-2

VDOT
TECHNICAL DATA FORM 1-2888.

II. HYDROLOGY

ACTUAL 30 DAY RAINFALL: _____ AVERAGE 30 DAY RAINFALL: _____

INUNDATED? ✓ YES _____ NO. DEPTH OF WATER: 0-2"

SATURATED SOILS? ✓ YES _____ NO. METHOD USED: Observation

OTHER INDICATORS: Crayfish chimneys; sediment deposits; channels

CLASSIFICATION: WETLANDS HYDROLOGY ✓ YES _____ NO Flooding BASIS

III. SOILS

SERIES: _____ TEXTURE(26CM DEPTH): Loamy sand

MOTTLES: _____ YES ✓ NO. MOTTLE COLOR: —

GLEYING: _____ YES ✓ NO.

SERIES ON HYDRIC SOILS LIST: _____ YES _____ NO.

MATRIX COLOR (26CM DEPTH): 10yr 2/1

OTHER INDICATORS: _____

CLASSIFICATION: WETLANDS SOILS ✓ YES _____ NO low chroma BASIS

IV. WETLANDS DETERMINATION: ✓ YES _____ NO 3+ parameters BASIS

ATYPICAL SITUATION: _____ YES ✓ NO.

COMMENTS:

DETERMINATION MADE BY: David M. DeMarco

VDOT
AQUATIC ECOLOGY WETLANDS DETERMINATION
TECHNICAL DATA FORM 1-2888

DATE: 27 April 1988 COUNTY: James City

LOCATION: 199-09 STREAM: Unnamed tributary

PLOT: 03 DRAINAGE BASIN: Chisel Run

ELEVATION: ≈ 43 ft FWS CLASSIFICATION: —

SITE DESCRIPTION: Upland-Wetland boundary along Northside

I. VEGETATION: LIST THE THREE DOMINANT SPECIES IN EACH VEGETATION LAYER.(FIVE If only one or two layers, list the five dominant.)
STRATA=T(TREES), S(SHRUB), H(HERBS), OR V(VINES).

STRATA/SPECIES	INDICATOR STATUS	PERCENT TOTAL
1. T) Fagus grandifolia	FACU	30
2. Nyssa sylvatica	FAC	<05
3. Quercus michauxii	FACW	<05
4. S) Fagus grandifolia	FACU	10
5. Ilex opaca	FACU+	05
6. Vaccinium stamineum	FACU-	<05
7. H) Thelypteris noveboracensis	—	<05
8. Hexastylis virginica	—	<05
9. V) Lonicera japonica	FAC-	<05
10.		
11.		
12.		

PERCENT OF NONWETLAND SPECIES: 66.7%

PERCENT OF WETLAND SPECIES: 33.3%

CLASSIFICATION: WETLAND VEGETATION? ____ YES ✓ NO Hydrovolume BASIS

09-3

VDOT
TECHNICAL DATA FORM 1-2888.

II. HYDROLOGY

ACTUAL 30 DAY RAINFALL: _____ AVERAGE 30 DAY RAINFALL: _____

INUNDATED? _____ YES ✓ NO. DEPTH OF WATER: —

SATURATED SOILS? _____ YES ✓ NO. METHOD USED: —

OTHER INDICATORS: —

CLASSIFICATION: WETLANDS HYDROLOGY _____ YES _____ NO _____ BASIS

III. SOILS

SERIES: _____ TEXTURE(26CM DEPTH): Loamy Sand

MOTTLES: ✓ YES _____ NO. MOTTLE COLOR: 10yr 7/1

GLEYING: _____ YES ✓ NO.

SERIES ON HYDRIC SOILS LIST: _____ YES _____ NO.

MATRIX COLOR (26CM DEPTH): 10yr 7/6

OTHER INDICATORS: _____

CLASSIFICATION: WETLANDS SOILS _____ YES ✓ NO Low chroma BASIS

IV. WETLANDS DETERMINATION: _____ YES ✓ NO 0+ parameters BASIS

ATYPICAL SITUATION: _____ YES ✓ NO.

COMMENTS:

DETERMINATION MADE BY: [illegible signature]

VDOT
AQUATIC ECOLOGY WETLANDS DETERMINATION
TECHNICAL DATA FORM 1-2888

DATE: 27 April COUNTY: James City

LOCATION: 199-11 STREAM: Chisel Run

PLOT: 01 DRAINAGE BASIN: Powhatan

ELEVATION: ≈ 42ft FWS CLASSIFICATION: —

SITE DESCRIPTION: Upland along south side of crossing

I. VEGETATION: LIST THE THREE DOMINANT SPECIES IN EACH VEGETATION LAYER.(FIVE If only one or two layers, list the five dominant.)
STRATA=T(TREES), S(SHRUB), H(HERBS), OR V(VINES).

STRATA/SPECIES	INDICATOR STATUS	PERCENT TOTAL
1. T) Cornus florida	FACU-	10
2. Liriodendron tulipifera	FACU-	15
3. Quercus alba	—	15
4. S) Corylus americana	—	15
5. Asimina parviflora	—	15
6. y Carpinus caroliniana	FAC	05
7. H) Thelypteris noveboracensis	—	15
8. Podophyllum peltatum	—	10
9. Lugula echinata	FACU	<05
10. V) Lonicera japonica	FAC-	10
11. Bignonia capreolata	—	<05
12.		

PERCENT OF NONWETLAND SPECIES: 91

PERCENT OF WETLAND SPECIES: 09%

CLASSIFICATION: WETLAND VEGETATION? ____ YES ✓ NO Morphological BASIS

#11-1

VDOT
TECHNICAL DATA FORM 1-2888.

II. HYDROLOGY

ACTUAL 30 DAY RAINFALL: _____ AVERAGE 30 DAY RAINFALL: _____

INUNDATED? _____ YES ✓ NO. DEPTH OF WATER: —

SATURATED SOILS? _____ YES ✓ NO. METHOD USED: —

OTHER INDICATORS: —

CLASSIFICATION: WETLANDS HYDROLOGY _____ YES ✓ NO _____ BASIS

III. SOILS

SERIES: _____ TEXTURE(26CM DEPTH): Coarse loamy sand

MOTTLES: ✓ YES _____ NO. MOTTLE COLOR: 10yr 6/2 (40%)

GLEYING: _____ YES ✓ NO.

SERIES ON HYDRIC SOILS LIST: _____ YES _____ NO.

MATRIX COLOR (26CM DEPTH): 10yr 7/6 (60%)

OTHER INDICATORS: —

CLASSIFICATION: WETLANDS SOILS _____ YES ✓ NO high chroma BASIS

IV. WETLANDS DETERMINATION: _____ YES ✓ NO 0 + parameters BASIS

ATYPICAL SITUATION: _____ YES _____ NO.

COMMENTS:

DETERMINATION MADE BY: David M. [illegible]

VDOT
AQUATIC ECOLOGY WETLANDS DETERMINATION
TECHNICAL DATA FORM 1-2888

DATE: 27 April 1988 COUNTY: James City

LOCATION: 199-11 STREAM: Chisel Run

PLOT: 02 DRAINAGE BASIN: Powhatan

ELEVATION: ≈42 ft FWS CLASSIFICATION: PFO1C

SITE DESCRIPTION: Flood plain along stream

I. VEGETATION: LIST THE THREE DOMINANT SPECIES IN EACH VEGETATION LAYER.(FIVE If only one or two layers, list the five dominant.)
STRATA=T(TREES), S(SHRUB), H(HERBS), OR V(VINES).

STRATA/SPECIES	INDICATOR STATUS	PERCENT TOTAL
1. T) Acer rubrum	FAC	30
2. Fraxinus pennsylvanica	FACW	20
3. Liquidambar styraciflua	FAC	10
4. S) Lindera benzoin	FACW-	20
5. y Fraxinus americana	FACW	10
6. y Quercus michauxii	FACW	<05
7. H) Cardamine bulbosa	OBL	05
8. Senecio aureus	FACW	20
9. Glyceria striata	OBL	25
10.		
11.		
12.		

PERCENT OF NONWETLAND SPECIES: 0%

PERCENT OF WETLAND SPECIES: 100%

CLASSIFICATION: WETLAND VEGETATION? ✓ YES ____ NO prevalence BASIS

#4 11-2

VDOT
TECHNICAL DATA FORM 1-2888.

II. HYDROLOGY

ACTUAL 30 DAY RAINFALL: _____ AVERAGE 30 DAY RAINFALL: _____

INUNDATED? ____ YES ✓ NO. DEPTH OF WATER: _____

SATURATED SOILS? ✓ YES ____ NO. METHOD USED: observation

OTHER INDICATORS: buttressing; sphagnum abundant; exposed roots

CLASSIFICATION: WETLANDS HYDROLOGY ✓ YES ____ NO Flooding BASIS

III. SOILS

SERIES: _____ TEXTURE(26CM DEPTH): _____

MOTTLES: ____ YES ✓ NO. MOTTLE COLOR: —

GLEYING: ____ YES ✓ NO.

SERIES ON HYDRIC SOILS LIST: ____ YES ____ NO.

MATRIX COLOR (26CM DEPTH): 10yr 7/1

OTHER INDICATORS: —

CLASSIFICATION: WETLANDS SOILS ✓ YES ____ NO Low chroma BASIS

IV. WETLANDS DETERMINATION: ✓ YES ____ NO 3+ parameters BASIS

ATYPICAL SITUATION: ____ YES ✓ NO.

COMMENTS:

DETERMINATION MADE BY: David M. DeMand

VDOT
AQUATIC ECOLOGY WETLANDS DETERMINATION
TECHNICAL DATA FORM 1-2888

DATE: 27 April 1988 COUNTY: James City

LOCATION: 199-11 STREAM: Chisel Run

PLOT: 03 DRAINAGE BASIN: Powhatan

ELEVATION: ≈ 42 FWS CLASSIFICATION: —

SITE DESCRIPTION: Upland slope north of wetland

I. VEGETATION: LIST THE THREE DOMINANT SPECIES IN EACH VEGETATION LAYER.(FIVE If only one or two layers, list the five dominant.)
STRATA=T(TREES), S(SHRUB), H(HERBS), OR V(VINES).

STRATA/SPECIES	INDICATOR STATUS	PERCENT TOTAL
1. T) Nyssa sylvatica	FAC	05
2. Liriodendron tulipifera	FACU-	30
3. Pinus taeda	FAC-	10
4. S) y Ilex opaca	FACU+	10
5. y Fagus grandifolia	FACU	10
6. y Acer rubrum	FAC	05
7. H) Thelypteris noveboracensis	—	<05
8. Uvularia perfoliata	FACU	<05
9. Mitchella repens	FACU	<05
10.		
11.		
12.		

PERCENT OF NONWETLAND SPECIES: 66.7%

PERCENT OF WETLAND SPECIES: 33.3%

CLASSIFICATION: WETLAND VEGETATION? ____ YES ✓ NO No prevalence BASIS

#11-3

VDOT
TECHNICAL DATA FORM 1-2888.

II. HYDROLOGY

ACTUAL 30 DAY RAINFALL: _____ AVERAGE 30 DAY RAINFALL: _____

INUNDATED? _____ YES ✓ NO. DEPTH OF WATER: —

SATURATED SOILS? _____ YES ✓ NO. METHOD USED: —

OTHER INDICATORS: —

CLASSIFICATION: WETLANDS HYDROLOGY _____ YES _____ NO _____ BASIS

III. SOILS

SERIES: _____ TEXTURE(26CM DEPTH): Loamy sand

MOTTLES: ✓ YES _____ NO. MOTTLE COLOR: 10yr 7/2

GLEYING: _____ YES ✓ NO.

SERIES ON HYDRIC SOILS LIST: _____ YES _____ NO.

MATRIX COLOR (26CM DEPTH): 10yr 6/6

OTHER INDICATORS: —

CLASSIFICATION: WETLANDS SOILS _____ YES ✓ NO high chroma BASIS

IV. WETLANDS DETERMINATION: _____ YES ✓ NO Ot Paramulus BASIS

ATYPICAL SITUATION: _____ YES ✓ NO.

COMMENTS:

DETERMINATION MADE BY: David M. DuMark

VDOT
AQUATIC ECOLOGY WETLANDS DETERMINATION
TECHNICAL DATA FORM 1-2888

DATE: 27 April 1988 COUNTY: James City

LOCATION: 199-12 STREAM: Unnamed Tributary

PLOT: 01 DRAINAGE BASIN: Long Hill Swamp

ELEVATION: ± 50-75 FT FWS CLASSIFICATION: PFO1A

SITE DESCRIPTION: Alluvial terrace and associated seepage slopes along intermittent stream.

I. VEGETATION: LIST THE THREE DOMINANT SPECIES IN EACH VEGETATION LAYER.(FIVE If only one or two layers, list the five dominant.)
STRATA=T(TREES), S(SHRUB), H(HERBS), OR V(VINES).

STRATA/SPECIES	INDICATOR STATUS	PERCENT TOTAL
1. T) Acer rubrum	FAC	30
2. Nyssa sylvatica	FAC	25
3. Ilex opaca	FACU+	05
4. S) Rhododendron canescens	FACW	<05
5. Magnolia virginiana	FACW	<05
6. Viburnum nudum	OBL	<05
7. H) Osmunda cinnamomea	FACW	20
8. Woodwardia areolata	FACW+	05
9. Arisaema triphyllum	FACW-	05
10. V) Smilax rotundifolia	FAC	<05
11. Decumaria barbara	OBL	<05
12.		

PERCENT OF NONWETLAND SPECIES: 9%

PERCENT OF WETLAND SPECIES: 91%

CLASSIFICATION: WETLAND VEGETATION? ✓ YES ____ NO prevalence BASIS

#12-1

VDOT
TECHNICAL DATA FORM 1-2888.

II. HYDROLOGY

ACTUAL 30 DAY RAINFALL: _____ AVERAGE 30 DAY RAINFALL: _____

INUNDATED? ____ YES ✓ NO. DEPTH OF WATER: —

SATURATED SOILS? ____ YES ✓ NO. METHOD USED: —

OTHER INDICATORS: Buttressing; exposed roots; channels

CLASSIFICATION: WETLANDS HYDROLOGY ✓ YES ____ NO Flooding BASIS

III. SOILS

SERIES: _____ TEXTURE(26CM DEPTH): Coarse loamy sand

MOTTLES: ✓ YES ____ NO. MOTTLE COLOR: 10yr 4/3

GLEYING: ____ YES ✓ NO.

SERIES ON HYDRIC SOILS LIST: ____ YES ____ NO.

MATRIX COLOR (26CM DEPTH): 10yr 4/1

OTHER INDICATORS: _____

CLASSIFICATION: WETLANDS SOILS ✓ YES ____ NO Low chroma BASIS

IV. WETLANDS DETERMINATION: ✓ YES ____ NO 3+ parameters BASIS

ATYPICAL SITUATION: ____ YES ✓ NO.

COMMENTS:

DETERMINATION MADE BY: [signature]

VDOT
AQUATIC ECOLOGY WETLANDS DETERMINATION
TECHNICAL DATA FORM 1-2888

DATE: 27 April 1988 COUNTY: James City

LOCATION: 199-12 STREAM: Unnamed Tributary

PLOT: 02 DRAINAGE BASIN: Long Hill Swamp

ELEVATION: 50-75 Ft FWS CLASSIFICATION: —

SITE DESCRIPTION: Slope adjacent wetland

I. VEGETATION: LIST THE THREE DOMINANT SPECIES IN EACH VEGETATION LAYER.(FIVE If only one or two layers, list the five dominant.)
STRATA=T(TREES), S(SHRUB), H(HERBS), OR V(VINES).

STRATA/SPECIES	INDICATOR STATUS	PERCENT TOTAL
1. T) Quercus alba	—	25
2. Fagus grandifolia	FACU	20
3. Carpinus caroliniana	FAC	05
4. S) Rhododendron canescens	FACW	05
5. Magnolia virginiana	FACW	05
6. Vaccinium stamineum	FACU-	10
7. H) Mitchella repens	FACU	<05
8. Osmunda cinnamomea	FACW	<05
9. V) —		
10.		
11.		
12.		

PERCENT OF NONWETLAND SPECIES: 50%

PERCENT OF WETLAND SPECIES: 50%

CLASSIFICATION: WETLAND VEGETATION? ____ YES ✓ NO ____ BASIS

#12-2

VDOT
TECHNICAL DATA FORM 1-2888.

II. HYDROLOGY

ACTUAL 30 DAY RAINFALL: _____ AVERAGE 30 DAY RAINFALL: _____

INUNDATED? _____ YES ✓ NO. DEPTH OF WATER: —

SATURATED SOILS? _____ YES ✓ NO. METHOD USED: —

OTHER INDICATORS: —

CLASSIFICATION: WETLANDS HYDROLOGY _____ YES ✓ NO _____ BASIS

III. SOILS

SERIES: _____ TEXTURE(26CM DEPTH): sand

MOTTLES: ✓ YES _____ NO. MOTTLE COLOR: 10yr 7/6

GLEYING: _____ YES ✓ NO.

SERIES ON HYDRIC SOILS LIST: _____ YES _____ NO.

MATRIX COLOR (26CM DEPTH): 10yr 8/3

OTHER INDICATORS: _____

CLASSIFICATION: WETLANDS SOILS _____ YES ✓ NO _____ BASIS

IV. WETLANDS DETERMINATION: _____ YES ✓ NO 0+ parameters BASIS

ATYPICAL SITUATION: _____ YES ✓ NO.

COMMENTS:

DETERMINATION MADE BY: [signature]

VDOT
AQUATIC ECOLOGY WETLANDS DETERMINATION
TECHNICAL DATA FORM 1-2888

DATE: 28 Apr 1988 COUNTY: James City

LOCATION: 199-13 STREAM: Long Hill Swamp

PLOT: 01 DRAINAGE BASIN: Powhatan Ck.

ELEVATION: ≈46' FWS CLASSIFICATION: —

SITE DESCRIPTION: N. slope adjacent wetland

I. VEGETATION: LIST THE THREE DOMINANT SPECIES IN EACH VEGETATION LAYER.(FIVE If only one or two layers, list the five dominant.)
STRATA=T(TREES), S(SHRUB), H(HERBS), OR V(VINES).

STRATA/SPECIES	INDICATOR STATUS	PERCENT TOTAL
1. T) Fagus grandifolia	FACU	30
2. Ilex opaca	FACU+	10
3. Nyssa sylvatica	FAC	05
4. S) Ilex opaca	FACU+	20
5. Vaccinium corymbosum	FACW-	<05
6. Myrica cerifera	FAC	<05
7. H) Mitchella repens	FACU	<05
8. Uvularia sp	—	<05
9. Tipularia discolor	FACU	<05
10.		
11.		
12.		

PERCENT OF NONWETLAND SPECIES: 70%

PERCENT OF WETLAND SPECIES: 30%

CLASSIFICATION: WETLAND VEGETATION? ____ YES ✓ NO ____ BASIS

#13-01

VDOT
TECHNICAL DATA FORM 1-2888.

II. HYDROLOGY

ACTUAL 30 DAY RAINFALL: _____ AVERAGE 30 DAY RAINFALL: _____

INUNDATED? _____ YES ✓ NO. DEPTH OF WATER: ✓

SATURATED SOILS? _____ YES ✓ NO. METHOD USED: —

OTHER INDICATORS: —

CLASSIFICATION: WETLANDS HYDROLOGY _____ YES ✓ NO — BASIS

III. SOILS

SERIES: _____ TEXTURE(26CM DEPTH): Sand

MOTTLES: ✓ YES _____ NO. MOTTLE COLOR: 10yr 7/1

GLEYING: _____ YES ✓ NO.

SERIES ON HYDRIC SOILS LIST: _____ YES _____ NO.

MATRIX COLOR (26CM DEPTH): 10yr 7/4

OTHER INDICATORS: —

CLASSIFICATION: WETLANDS SOILS _____ YES ✓ NO high chroma BASIS

IV. WETLANDS DETERMINATION: _____ YES ✓ NO 0+ parameters BASIS

ATYPICAL SITUATION: _____ YES ✓ NO.

COMMENTS:

DETERMINATION MADE BY: David M. [illegible]

VDOT
AQUATIC ECOLOGY WETLANDS DETERMINATION
TECHNICAL DATA FORM 1-2888

DATE: 28 April 1988 COUNTY: James City

LOCATION: 199-13 STREAM: Long Hill Swamp

PLOT: 02 DRAINAGE BASIN: Powhatan

ELEVATION: ±46' FWS CLASSIFICATION: PFO1H (beaver)

SITE DESCRIPTION: Beaver impounded alluvial terrace

I. VEGETATION: LIST THE THREE DOMINANT SPECIES IN EACH VEGETATION LAYER.(FIVE If only one or two layers, list the five dominant.)
STRATA=T(TREES), S(SHRUB), H(HERBS), OR V(VINES).

STRATA/SPECIES	INDICATOR STATUS	PERCENT TOTAL
1. T) Fraxinus pennsylvanica	FACW	30
2. Acer rubrum	FAC	10
3. Platanus occidentalis	FACW-	05
4. S Itea virginica	OBL	10
5. Alnus serrulata	OBL	<05
6. Carpinus caroliniana	FAC	05
7. V. Lonicera japonica	FAC-	<05
8.		
9.		
10.		
11.		
12.		

PERCENT OF NONWETLAND SPECIES: _____

PERCENT OF WETLAND SPECIES: _____

CLASSIFICATION: WETLAND VEGETATION? ✓ YES ____ NO prevalence BASIS

#13-2

VDOT
TECHNICAL DATA FORM 1-2888.

II. HYDROLOGY

ACTUAL 30 DAY RAINFALL: _____ AVERAGE 30 DAY RAINFALL: _____

INUNDATED? ✓ YES _____ NO. DEPTH OF WATER: 2-3 ft

SATURATED SOILS? ✓ YES _____ NO. METHOD USED: Observation

OTHER INDICATORS: _____

CLASSIFICATION: WETLANDS HYDROLOGY ✓ YES _____ NO flooding BASIS

III. SOILS*

SERIES: _____ TEXTURE(26CM DEPTH): loamy sand at 6"

MOTTLES: _____ YES ✓ NO. MOTTLE COLOR: —

GLEYING: _____ YES ✓ NO.

SERIES ON HYDRIC SOILS LIST: _____ YES _____ NO.

MATRIX COLOR (26CM DEPTH): 10yr 4/1 (at 6")

OTHER INDICATORS: _____

CLASSIFICATION: WETLANDS SOILS ✓ YES _____ NO low chroma BASIS

IV. WETLANDS DETERMINATION: ✓ YES _____ NO 3+ parameters BASIS

ATYPICAL SITUATION: _____ YES ✓ NO.

COMMENTS:
*soil sample taken near north slope.

DETERMINATION MADE BY: [signature]

VDOT
AQUATIC ECOLOGY WETLANDS DETERMINATION
TECHNICAL DATA FORM 1-2888

DATE: 28 Apr 1988 COUNTY: James City

LOCATION: 199-13 STREAM: Long Hill Swamp

PLOT: 03 DRAINAGE BASIN: Powhatan

ELEVATION: ≈ 46' FWS CLASSIFICATION: —

SITE DESCRIPTION: Adjacent upland slope along south side

I. VEGETATION: LIST THE THREE DOMINANT SPECIES IN EACH VEGETATION LAYER.(FIVE If only one or two layers, list the five dominant.)
STRATA=T(TREES), S(SHRUB), H(HERBS), OR V(VINES).

STRATA/SPECIES	INDICATOR STATUS	PERCENT TOTAL
1. T) Fagus grandifolia	FACU	40
2. Pinus taeda	FAC-	20
3. Carya tomentosa	—	05
4. S) y Fagus grandifolia		<05
5. Kalmia latifolia	FACU	<05
6. y Ilex opaca	FACU+	<05
7. H) Polystichum acrostichoides	—	<05
8. Uvularia sp	—	<05
9. Mitchella repens	FACU	<05
10. V) —		
11.		
12.		

PERCENT OF NONWETLAND SPECIES: 100%

PERCENT OF WETLAND SPECIES: 0%

CLASSIFICATION: WETLAND VEGETATION? ____ YES ✓ NO ____ BASIS

#13-3

VDOT
TECHNICAL DATA FORM 1-2888.

II. HYDROLOGY

ACTUAL 30 DAY RAINFALL: _____ AVERAGE 30 DAY RAINFALL: _____

INUNDATED? _____ YES ✓ NO. DEPTH OF WATER: —

SATURATED SOILS? _____ YES ✓ NO. METHOD USED: —

OTHER INDICATORS: —

CLASSIFICATION: WETLANDS HYDROLOGY _____ YES ✓ NO _____ BASIS

III. SOILS

SERIES: _____ TEXTURE(26CM DEPTH): Loamy sand

MOTTLES: _____ YES ✓ NO. MOTTLE COLOR: —

GLEYING: _____ YES ✓ NO.

SERIES ON HYDRIC SOILS LIST: _____ YES ✓ NO.

MATRIX COLOR (26CM DEPTH): 10yr 6/6

OTHER INDICATORS: —

CLASSIFICATION: WETLANDS SOILS _____ YES ✓ NO high chroma BASIS

IV. WETLANDS DETERMINATION: _____ YES ✓ NO 0 of parameters BASIS

ATYPICAL SITUATION: _____ YES ✓ NO.

COMMENTS:

DETERMINATION MADE BY: David M. Earnest

VDOT
AQUATIC ECOLOGY WETLANDS DETERMINATION
TECHNICAL DATA FORM 1-2888

DATE: 28 April 1988 COUNTY: James City

LOCATION: 199-14 STREAM: Unnamed Tributary

PLOT: 01 DRAINAGE BASIN: Long Hill Swamp

ELEVATION: ≈ 47 ft FWS CLASSIFICATION: —

SITE DESCRIPTION: South side slope above wetland

I. VEGETATION: LIST THE THREE DOMINANT SPECIES IN EACH VEGETATION LAYER.(FIVE If only one or two layers, list the five dominant.)
STRATA=T(TREES), S(SHRUB), H(HERBS), OR V(VINES).

STRATA/SPECIES	INDICATOR STATUS	PERCENT TOTAL
1. T) Ilex opaca	FACU+	30
2. Quercus alba	—	05
3. Acer rubrum	FAC	10
4. S) y Quercus alba	—	05
5. Vaccinium tenellum	—	15
6. Magnolia virginiana	FACW	05
7. H) Cypripedium acaule	FACU	<05
8. mitchella repens	FACU	<05
9. V) Lonicera japonica	FAC-	<05
10.		
11.		
12.		

PERCENT OF NONWETLAND SPECIES: 77.8%

PERCENT OF WETLAND SPECIES: 22.2%

CLASSIFICATION: WETLAND VEGETATION? ____ YES ✓ NO ____ BASIS

14 -1

VDOT
TECHNICAL DATA FORM 1-2888.

II. HYDROLOGY

ACTUAL 30 DAY RAINFALL: _____ AVERAGE 30 DAY RAINFALL: _____

INUNDATED? _____ YES ✓ NO. DEPTH OF WATER: —

SATURATED SOILS? _____ YES ✓ NO. METHOD USED: —

OTHER INDICATORS: —

CLASSIFICATION: WETLANDS HYDROLOGY _____ YES _____ NO _____ BASIS

III. SOILS

SERIES: _____ TEXTURE(26CM DEPTH): Loamy sand

MOTTLES: ✓ YES _____ NO. MOTTLE COLOR: 10yr 7/1

GLEYING: _____ YES ✓ NO.

SERIES ON HYDRIC SOILS LIST: _____ YES _____ NO.

MATRIX COLOR (26CM DEPTH): 10yr 7/3

OTHER INDICATORS: _____

CLASSIFICATION: WETLANDS SOILS _____ YES ✓ NO high chroma BASIS

IV. WETLANDS DETERMINATION: _____ YES ✓ NO 0+ parameters BASIS

ATYPICAL SITUATION: _____ YES ✓ NO.

COMMENTS:

DETERMINATION MADE BY: David M. Dunlap

VDOT
AQUATIC ECOLOGY WETLANDS DETERMINATION
TECHNICAL DATA FORM 1-2888

DATE: 28 April 1988 COUNTY: James City

LOCATION: 199-14 STREAM: Unnamed Tributary

PLOT: 02 DRAINAGE BASIN: Long Hill Swamp

ELEVATION: ≈ 47 ft FWS CLASSIFICATION: PSS1C

SITE DESCRIPTION: Narrow band of young wooded swamp along stream.

I. VEGETATION: LIST THE THREE DOMINANT SPECIES IN EACH VEGETATION LAYER.(FIVE If only one or two layers, list the five dominant.)
STRATA=T(TREES), S(SHRUB), H(HERBS), OR V(VINES).

STRATA/SPECIES	INDICATOR STATUS	PERCENT TOTAL
1. T) Acer rubrum	FAC	05
2. Myrica cerifera	FAC	25
3. Carpinus caroliniana	FAC	15
4. S) Lindera benzoin	FACW-	15
5. Myrica cerifera	FAC	20
6. Ilex virginica	OBL	20
7. H) Osmunda cinnamomea	FACW	30
8. Carex sp	—	20
9. Woodwardia areolata	FACW+	10
10. V) Lonicera japonica	FAC-	<05
11. Decumaria barbara	OBL	<05
12. Smilax rotundifolia	FAC	<05

PERCENT OF NONWETLAND SPECIES: 0%

PERCENT OF WETLAND SPECIES: 100%

CLASSIFICATION: WETLAND VEGETATION? ✓ YES ____ NO Prevalence BASIS

#14-2

VDOT
TECHNICAL DATA FORM 1-2888.

II. HYDROLOGY

ACTUAL 30 DAY RAINFALL: _____ AVERAGE 30 DAY RAINFALL: _____

INUNDATED? ____ YES ✓ NO. DEPTH OF WATER: —

SATURATED SOILS? ✓ YES ____ NO. METHOD USED: Observation

OTHER INDICATORS: water 1" from surface; abundant sphagnum; channels

CLASSIFICATION: WETLANDS HYDROLOGY ✓ YES ____ NO Flooding BASIS

III. SOILS

SERIES: _____ TEXTURE(26CM DEPTH): Loamy sand

MOTTLES: ✓ YES ____ NO. MOTTLE COLOR: 10yr 4/4

GLEYING: ____ YES ✓ NO.

SERIES ON HYDRIC SOILS LIST: ____ YES ____ NO.

MATRIX COLOR (26CM DEPTH): 10yr 3/1

OTHER INDICATORS: —

CLASSIFICATION: WETLANDS SOILS ✓ YES ____ NO Low chroma BASIS

IV. WETLANDS DETERMINATION: ✓ YES ____ NO 3+ parameters BASIS

ATYPICAL SITUATION: ____ YES ✓ NO.

COMMENTS:

DETERMINATION MADE BY: [signature]

VDOT
AQUATIC ECOLOGY WETLANDS DETERMINATION
TECHNICAL DATA FORM 1-2888

DATE: 28 April 1988 COUNTY: James City

LOCATION: 159-14 STREAM: Unnamed Tributary

PLOT: 03 DRAINAGE BASIN: Long Hill Swamp

ELEVATION: ≈ 47' FWS CLASSIFICATION: —

SITE DESCRIPTION: North slope adjacent to wetland

I. VEGETATION: LIST THE THREE DOMINANT SPECIES IN EACH VEGETATION LAYER.(FIVE If only one or two layers, list the five dominant.)
STRATA=T(TREES), S(SHRUB), H(HERBS), OR V(VINES).

STRATA/SPECIES	INDICATOR STATUS	PERCENT TOTAL
1. T) Ilex opaca	FACU+	40
2. Quercus alba	—	20
3. Liquidambar styraciflua	FAC	05
4. S) Vaccinium corymbosum	FACW-	10
5. Ilex opaca	FACU+	10
6. Fagus grandifolia	FACU	05
7. H) Chasmanthemum laxum	FAC	<05
8. Mitchella repens	FACU	<05
9. V Lonicera japonica	FAC-	15
10. Toxicodendron radicans	FAC	<05
11.		
12.		

PERCENT OF NONWETLAND SPECIES: 20%

PERCENT OF WETLAND SPECIES: 30%

CLASSIFICATION: WETLAND VEGETATION? ____ YES ✓ NO — BASIS

#14-3

VDOT
TECHNICAL DATA FORM 1-2888.

II. HYDROLOGY

ACTUAL 30 DAY RAINFALL: _____ AVERAGE 30 DAY RAINFALL: _____

INUNDATED? _____ YES ✓ NO. DEPTH OF WATER: —

SATURATED SOILS? _____ YES ✓ NO. METHOD USED: —

OTHER INDICATORS: —

CLASSIFICATION: WETLANDS HYDROLOGY _____ YES ✓ NO — BASIS

III. SOILS

SERIES: _____ TEXTURE(26CM DEPTH): Sand

MOTTLES: ✓ YES _____ NO. MOTTLE COLOR: 10yr 8/2

GLEYING: _____ YES ✓ NO.

SERIES ON HYDRIC SOILS LIST: _____ YES _____ NO.

MATRIX COLOR (26CM DEPTH): 10yr 8/3

OTHER INDICATORS: _____

CLASSIFICATION: WETLANDS SOILS _____ YES ✓ NO high chroma BASIS

IV. WETLANDS DETERMINATION: _____ YES ✓ NO 0+parameters BASIS

ATYPICAL SITUATION: _____ YES ✓ NO.

COMMENTS:

DETERMINATION MADE BY: [signature]

VDOT
AQUATIC ECOLOGY WETLANDS DETERMINATION
TECHNICAL DATA FORM 1-2888

DATE: 27 April 1988 COUNTY: James City

LOCATION: 199-15 (Montecello Ext.) STREAM: Unnamed Tributary

PLOT: 01 DRAINAGE BASIN: Chisel Run

ELEVATION: ≈ 75 ft FWS CLASSIFICATION: —

SITE DESCRIPTION: ~~Intermittent headwater stream with associated terrace and seepage slope~~. This plot in upland adjacent to wetland

I. VEGETATION: LIST THE THREE DOMINANT SPECIES IN EACH VEGETATION LAYER.(FIVE If only one or two layers, list the five dominant.)
STRATA=T(TREES), S(SHRUB), H(HERBS), OR V(VINES).

STRATA/SPECIES	INDICATOR STATUS	PERCENT TOTAL
1. T) Acer rubrum	FAC	30
2. Quercus alba	—	10
3. Oxydendrum arboreum	—	<05
4. S) Vaccinium stamineum	FACU-	<05
5. Ilex opaca	FACU+	<05
6. Liquidambar styraciflua	FAC	<05
7. H) Osmunda cinnamomea	FACW	<05
8. Pteridium aquilinum	FACU	<05
9.		
10. V) Lonicera japonica	FAC-	<05
11.		
12.		

PERCENT OF NONWETLAND SPECIES: 66.7%

PERCENT OF WETLAND SPECIES: 33.3%

CLASSIFICATION: WETLAND VEGETATION? ____ YES ✓ NO no prevalence BASIS

#15-1

VDOT
TECHNICAL DATA FORM 1-2888.

II. HYDROLOGY

ACTUAL 30 DAY RAINFALL: _____ AVERAGE 30 DAY RAINFALL: _____

INUNDATED? _____ YES ✓ NO. DEPTH OF WATER: —

SATURATED SOILS? _____ YES ✓ NO. METHOD USED: —

OTHER INDICATORS: —

CLASSIFICATION: WETLANDS HYDROLOGY _____ YES _____ NO _____ BASIS

III. SOILS

SERIES: _____ TEXTURE(26CM DEPTH): Sand

MOTTLES: _____ YES ✓ NO. MOTTLE COLOR: —

GLEYING: _____ YES ✓ NO.

SERIES ON HYDRIC SOILS LIST: _____ YES _____ NO.

MATRIX COLOR (26CM DEPTH): 10yr 6/2

OTHER INDICATORS: —

CLASSIFICATION: WETLANDS SOILS _____ YES ✓ NO high chroma BASIS

IV. WETLANDS DETERMINATION: _____ YES ✓ NO 0+ parameters BASIS

ATYPICAL SITUATION: _____ YES ✓ NO.

COMMENTS:

DETERMINATION MADE BY: David M. Dee Maud

VDOT
AQUATIC ECOLOGY WETLANDS DETERMINATION
TECHNICAL DATA FORM 1-2888

DATE: 27 April 1988 COUNTY: James City County

LOCATION: 199-15 (≈ St. 157+50 - 158+00) STREAM: Unnamed Tributary

PLOT: 02 (Montevillo Ave. Ext.) DRAINAGE BASIN: Chisel Run

ELEVATION: ≈ 75 ft FWS CLASSIFICATION: PFO1A

SITE DESCRIPTION: Intermittent headwater stream with associated wet terrace and seepage slope.

I. VEGETATION: LIST THE THREE DOMINANT SPECIES IN EACH VEGETATION LAYER.(FIVE If only one or two layers, list the five dominant.)
STRATA=T(TREES), S(SHRUB), H(HERBS), OR V(VINES).

STRATA/SPECIES	INDICATOR STATUS	PERCENT TOTAL
1. T) Acer rubrum	FAC	20
2. Nyssa sylvatica	FAC	30
3. Carpinus caroliniana	FAC	05
4. S) y Ilex opaca	FACU+	05
5. y Magnolia virginiana	FACW+	<05
6. Leucothoe racemosa	FACW	<05
7. H) Osmunda cinnamomea	FACW	20
8. Lycopodium obscurum	FACU	10
9. Woodwardia areolata	FACW+	05
10. r) Smilax rotundifolia	FAC	<05
11.		
12.		

PERCENT OF NONWETLAND SPECIES: 20%

PERCENT OF WETLAND SPECIES: 80%

CLASSIFICATION: WETLAND VEGETATION? ✓ YES ____ NO Percentage BASIS

15-2

VDOT
TECHNICAL DATA FORM 1-2888.

II. HYDROLOGY

ACTUAL 30 DAY RAINFALL: _____ AVERAGE 30 DAY RAINFALL: _____

INUNDATED? _____ YES ✓ NO. DEPTH OF WATER: –

SATURATED SOILS? _____ YES ✓ NO. METHOD USED: –

OTHER INDICATORS: Buttressing; Crayfish chimneys; exposed roots

CLASSIFICATION: WETLANDS HYDROLOGY ✓ YES _____ NO Flooding BASIS

III. SOILS

SERIES: _____ TEXTURE(26CM DEPTH): Loamy sand

MOTTLES: _____ YES ✓ NO. MOTTLE COLOR: _____

GLEYING: _____ YES ✓ NO.

SERIES ON HYDRIC SOILS LIST: _____ YES _____ NO.

MATRIX COLOR (26CM DEPTH): 10yr 2/1

OTHER INDICATORS: Darkly stained by organic matter

CLASSIFICATION: WETLANDS SOILS ✓ YES _____ NO Low chroma BASIS

IV. WETLANDS DETERMINATION: ✓ YES _____ NO 3+ parameters BASIS

ATYPICAL SITUATION: _____ YES ✓ NO.

COMMENTS:

DETERMINATION MADE BY: David M. DeMond

VDOT
AQUATIC ECOLOGY WETLANDS DETERMINATION
TECHNICAL DATA FORM 1-2888

DATE: 27 April 1988 COUNTY: James City County

LOCATION: 199-17 (monticello Ave. Ext.) STREAM: Unnamed Tributary

PLOT: 01 DRAINAGE BASIN: Chisel Run

ELEVATION: ≈ 90 ft FWS CLASSIFICATION: _____

SITE DESCRIPTION: Upland slope adjacent to east side of wetland.

I. VEGETATION: LIST THE THREE DOMINANT SPECIES IN EACH VEGETATION LAYER.(FIVE If only one or two layers, list the five dominant.)
STRATA=T(TREES), S(SHRUB), H(HERBS), OR V(VINES).

STRATA/SPECIES	INDICATOR STATUS	PERCENT TOTAL
1. T) Pinus virginiana	—	15
2. Liriodendron tulipifera	FACU-	20
3. Ilex opaca	FACU+	10
4. S) Vaccinium stamineum	FACU-	20
5. Ilex opaca	FACU+	05
6. y Magnolia virginiana	FACW+	<05
7. H) Osmunda cinnamomea	FACW	20
8. Woodwardia areolata	FACW+	05
9. Mitchella repens	FACU	<05
10. ✓ —		
11.		
12.		

PERCENT OF NONWETLAND SPECIES: 66.7%

PERCENT OF WETLAND SPECIES: 33.3%

CLASSIFICATION: WETLAND VEGETATION? ✓ YES ____ NO prevalence BASIS

#17-1

VDOT
TECHNICAL DATA FORM 1-2888.

II. HYDROLOGY

ACTUAL 30 DAY RAINFALL: _____ AVERAGE 30 DAY RAINFALL: _____

INUNDATED? _____ YES ✓ NO. DEPTH OF WATER: —

SATURATED SOILS? _____ YES ✓ NO. METHOD USED: —

OTHER INDICATORS: —

CLASSIFICATION: WETLANDS HYDROLOGY _____ YES _____ NO _____ BASIS

III. SOILS

SERIES: _____ TEXTURE(26CM DEPTH): Sand

MOTTLES: _____ YES ✓ NO. MOTTLE COLOR: —

GLEYING: _____ YES ✓ NO.

SERIES ON HYDRIC SOILS LIST: _____ YES _____ NO.

MATRIX COLOR (26CM DEPTH): 10yr 8/2 (parent material)

OTHER INDICATORS: —

CLASSIFICATION: WETLANDS SOILS _____ YES ✓ NO high chroma BASIS

IV. WETLANDS DETERMINATION: _____ YES ✓ NO 0+ parameters BASIS

ATYPICAL SITUATION: _____ YES ✓ NO.

COMMENTS:

DETERMINATION MADE BY: David M. Dunmond

VDOT
AQUATIC ECOLOGY WETLANDS DETERMINATION
TECHNICAL DATA FORM 1-2888

DATE: 27 April 1988 COUNTY: James City

LOCATION: 199-17 (Monticello Ave. Ext.) STREAM: Unnamed Tributary

PLOT: 02 DRAINAGE BASIN: Chisel Run

ELEVATION: ≈ 90 FT FWS CLASSIFICATION: PFO1A

SITE DESCRIPTION: Intermittent stream and associated Terrace and seep area.

I. VEGETATION: LIST THE THREE DOMINANT SPECIES IN EACH VEGETATION LAYER.(FIVE If only one or two layers, list the five dominant.)
STRATA=T(TREES), S(SHRUB), H(HERBS), OR V(VINES).

STRATA/SPECIES	INDICATOR STATUS	PERCENT TOTAL
1. T) Nyssa sylvatica	FAC	30
2. Acer rubrum	FAC	10
3. Liquidambar styraciflua	FAC	05
4. S) y Magnolia virginiana	FACW+	05
5. Viburnum nudum	OBL	05
6. Leucothoe racemosa	FACW	<05
7. H) Osmunda cinnamomea	FACW	40
8. Woodwardia areolata	FACW+	10
9. Saururus cernuus	OBL	05
10. V) Parthenocissus quinquefolia	FACU	
11.		
12.		

PERCENT OF NONWETLAND SPECIES: 10%

PERCENT OF WETLAND SPECIES: 90%

CLASSIFICATION: WETLAND VEGETATION? ✓ YES ____ NO prevalence BASIS

#17-2

VDOT
TECHNICAL DATA FORM 1-2888.

II. HYDROLOGY

ACTUAL 30 DAY RAINFALL: _____ AVERAGE 30 DAY RAINFALL: _____

INUNDATED? _____ YES ✓ NO. DEPTH OF WATER: –

SATURATED SOILS? _____ YES ✓ NO. METHOD USED: –

OTHER INDICATORS: channels; crayfish chimneys; channels

CLASSIFICATION: WETLANDS HYDROLOGY ✓ YES _____ NO Flooding BASIS

III. SOILS

SERIES: _____ TEXTURE(26CM DEPTH): silty loam or sand

MOTTLES: _____ YES ✓ NO. MOTTLE COLOR: –

GLEYING: _____ YES ✓ NO.

SERIES ON HYDRIC SOILS LIST: _____ YES _____ NO.

MATRIX COLOR (26CM DEPTH): 10yr 7 or 6/2 in sand 10yr 3/1 in silty loam

OTHER INDICATORS: –

CLASSIFICATION: WETLANDS SOILS ✓ YES _____ NO Low chroma BASIS

IV. WETLANDS DETERMINATION: ✓ YES _____ NO 3 + parameters BASIS

ATYPICAL SITUATION: _____ YES ✓ NO.

COMMENTS:

DETERMINATION MADE BY: David H. DeMond

VDOT
AQUATIC ECOLOGY WETLANDS DETERMINATION
TECHNICAL DATA FORM 1-2868

DATE: 27 April 1988 COUNTY: James City

LOCATION: 199-17 (monticello Ave. Ext) STREAM: Unnamed Tributary

PLOT: 03 DRAINAGE BASIN: Chisel Run

ELEVATION: ≈ 90 ft FWS CLASSIFICATION: —

SITE DESCRIPTION: Upland adjacent wetland on west side.

I. VEGETATION: LIST THE THREE DOMINANT SPECIES IN EACH VEGETATION LAYER.(FIVE If only one or two layers, list the five dominant.)
STRATA=T(TREES), S(SHRUB), H(HERBS), OR V(VINES).

STRATA/SPECIES	INDICATOR STATUS	PERCENT TOTAL
1. T) Liriodendron tulipifera	FACU-	30
2. Liquidambar styraciflua	FAC	20
3. Acer rubrum	FAC	05
4. S) y Magnolia virginiana	FACW+	05
5. y Quercus falcata	FACU-	<05
6. y Fagus grandifolia	FACU	<05
7. H) Woodwardia areolata	FACW+ -	<0
8. Thelypteris noveboracensis	FAC -	05
9. Osmunda cinnamomea	FACW -	<05
10. V) Lonicera japonica	FAC -	05
11.		
12.		

PERCENT OF NONWETLAND SPECIES: 60%

PERCENT OF WETLAND SPECIES: 40%

CLASSIFICATION: WETLAND VEGETATION? ____ YES ✓ NO Dominance BASIS

#17-3

VDOT
TECHNICAL DATA FORM 1-2888.

II. HYDROLOGY

ACTUAL 30 DAY RAINFALL: _____ AVERAGE 30 DAY RAINFALL: _____

INUNDATED? _____ YES ✓ NO. DEPTH OF WATER: —

SATURATED SOILS? _____ YES ✓ NO. METHOD USED: —

OTHER INDICATORS: —

CLASSIFICATION: WETLANDS HYDROLOGY _____ YES ✓ NO _____ BASIS

III. SOILS

SERIES: _____ TEXTURE(26CM DEPTH): Sandy loam

MOTTLES: ✓ YES _____ NO. MOTTLE COLOR: 10yr 6/3

GLEYING: _____ YES ✓ NO.

SERIES ON HYDRIC SOILS LIST: _____ YES _____ NO.

MATRIX COLOR (26CM DEPTH): 10yr 4/3

OTHER INDICATORS: _____

CLASSIFICATION: WETLANDS SOILS _____ YES ✓ NO _____ BASIS

IV. WETLANDS DETERMINATION: _____ YES ✓ NO 0+ parameters BASIS

ATYPICAL SITUATION: _____ YES ✓ NO.

COMMENTS:

DETERMINATION MADE BY: David M. DeMarco

VDOT
AQUATIC ECOLOGY WETLANDS DETERMINATION
TECHNICAL DATA FORM 1-2888

DATE: 27 April 1988 COUNTY: James City

LOCATION: 199-19 STREAM: Unnamed Tributary

PLOT: 01 DRAINAGE BASIN: Chisel Run

ELEVATION: ≈75 ft FWS CLASSIFICATION: PFO1A

SITE DESCRIPTION: Seepage slope above stream channel gently down sandy clay loam. Close to station 293+50.

I. VEGETATION: LIST THE THREE DOMINANT SPECIES IN EACH VEGETATION LAYER.(FIVE If only one or two layers, list the five dominant.)
STRATA=T(TREES), S(SHRUB), H(HERBS), OR V(VINES).

STRATA/SPECIES	INDICATOR STATUS	PERCENT TOTAL
1. T) Nyssa sylvatica	FAC	40
2. Fagus grandifolia	FACU	10
3. Ilex opaca	FACU+	10
4. S) y Magnolia virginiana	FACW	10
5. Vaccinium marianum	FACW	05
6. Ilex laevigata	OBL	<05
7. H) Osmunda cinnamomea	FACW	20
8. Woodwardia areolata	FACW+	10
9. Thelypteris noveboracensis	—	<05
10. V) —		
11.		
12.		

PERCENT OF NONWETLAND SPECIES: 22.2%

PERCENT OF WETLAND SPECIES: 78.8%

CLASSIFICATION: WETLAND VEGETATION? ✓ YES ____ NO Prevalence BASIS

#19-1

VDOT
TECHNICAL DATA FORM 1-2888.

II. HYDROLOGY

ACTUAL 30 DAY RAINFALL: _____ AVERAGE 30 DAY RAINFALL: _____

INUNDATED? _____ YES ✓ NO. DEPTH OF WATER: —

SATURATED SOILS? _____ YES ✓ NO. METHOD USED: —

OTHER INDICATORS: buttressing; exposed roots; abundant sphagnum

CLASSIFICATION: WETLANDS HYDROLOGY ✓ YES _____ NO wet soils BASIS

III. SOILS

SERIES: _____ TEXTURE(26CM DEPTH): sand

MOTTLES: _____ YES ✓ NO. MOTTLE COLOR: —

GLEYING: _____ YES ✓ NO.

SERIES ON HYDRIC SOILS LIST: _____ YES _____ NO.

MATRIX COLOR (26CM DEPTH): 10yr 7/1

OTHER INDICATORS: Clay loam below at about 30cm causing perching.

CLASSIFICATION: WETLANDS SOILS ✓ YES _____ NO low chroma BASIS

IV. WETLANDS DETERMINATION: ✓ YES _____ NO 3+ parameters BASIS

ATYPICAL SITUATION: _____ YES ✓ NO.

COMMENTS:

TERMINATION MADE BY: [signature]

VDOT
AQUATIC ECOLOGY WETLANDS DETERMINATION
TECHNICAL DATA FORM 1-2888

DATE: 27 April

COUNTY: James City

LOCATION: 99-19

STREAM: Unnamed headwater

PLOT: 02

DRAINAGE BASIN: Chisel Run

ELEVATION: ≈ 75 Ft

FWS CLASSIFICATION: —

SITE DESCRIPTION: Upland adjacent seepage area

I. VEGETATION: LIST THE THREE DOMINANT SPECIES IN EACH VEGETATION LAYER.(FIVE If only one or two layers, list the five dominant.)
STRATA=T(TREES), S(SHRUB), H(HERBS), OR V(VINES).

STRATA/SPECIES	INDICATOR STATUS	PERCENT TOTAL
1. T) Fagus grandifolia	FACU	05
2. Quercus alba	—	10
3. Ilex opaca	FACU+	20
4. S) Vaccinium stamineum	FACU-	25
5. Magnolia virginiana	FACW+	10
6. Ilex opaca	FACU+	15
7. H) Carex [illegible]	FACU	<05
8. Woodwardia areolata	FACW+	<05
9. Hexastylis virginica	—	<05
10. V) Smilax rotundifolia	FAC	<05
11.		
12.		

PERCENT OF NONWETLAND SPECIES: 70%

PERCENT OF WETLAND SPECIES: 30%

CLASSIFICATION: WETLAND VEGETATION? ____ YES ✓ NO Nonwetland BASIS

#19-2

VDOT
TECHNICAL DATA FORM 1-2888.

II. HYDROLOGY

ACTUAL 30 DAY RAINFALL: _____ AVERAGE 30 DAY RAINFALL: _____

INUNDATED? _____ YES ✓ NO. DEPTH OF WATER: ✓

SATURATED SOILS? _____ YES ✓ NO. METHOD USED: —

OTHER INDICATORS: —

CLASSIFICATION: WETLANDS HYDROLOGY _____ YES _____ NO _____ BASIS

III. SOILS

SERIES: _____ TEXTURE(26CM DEPTH): Coarse sand

MOTTLES: ✓ YES _____ NO. MOTTLE COLOR: 10yr 7/1

GLEYING: _____ YES ✓ NO.

SERIES ON HYDRIC SOILS LIST: _____ YES _____ NO.

MATRIX COLOR (26CM DEPTH): 10yr 5/3

OTHER INDICATORS: _____

CLASSIFICATION: WETLANDS SOILS _____ YES ✓ NO high chroma BASIS

IV. WETLANDS DETERMINATION: _____ YES ✓ NO 0+ parameters BASIS

ATYPICAL SITUATION: _____ YES ✓ NO.

COMMENTS:

DETERMINATION MADE BY: [signature]

DATE DUE

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