



U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
and
VIRGINIA DEPARTMENT OF TRANSPORTATION

An aerial photograph of a multi-lane highway interchange. Several cars are visible on the road, including a silver SUV and a white van. Overhead structures, likely for signs or lighting, span across the highway. The background shows some trees and a building.

ENVIRONMENTAL ASSESSMENT

ROUTE 29 BYPASS

Albemarle County
State Project No.: 0029-002-844, P101; UPC 102419
From: Route 250 Bypass
To: U.S. Route 29 North of South Fork Rivanna River



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Submitted Pursuant to 42 U.S.C. 4332(2)(C)

Approved for Public Availability

8/23/12

Date



For Division Administrator
Federal Highway Administration

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1.1 INTRODUCTION

The proposed project is the product of many years of study and discussion with citizens and local officials. Among the studies conducted were Draft and Final Environmental Impact Statements documenting a major corridor study, Draft and Final Environmental Assessments documenting changes to the project termini, a Re-evaluation to discuss proposed design changes to the project and their environmental consequences, and a Section 4(f) Evaluation to discuss new information received on Albemarle County school properties. A Supplemental Environmental Impact Statement (SEIS) also was prepared to consider more fully the effects of the Selected Alternative on the South Fork Rivanna River Reservoir and its watershed and the effects of the project's northern terminus on archaeological resources.

Due to recent actions to provide funding to complete design and right-of-way acquisition and advance the project for construction, this Environmental Assessment (EA) has been prepared to address changes to the project and new information or circumstances relevant to environmental concerns and bearing on the proposed project and its impacts (e.g., changes to the affected environment and changes to applicable laws and regulations) since completion of previous documents submitted pursuant to the National Environmental Policy Act (NEPA).¹ This EA has been prepared in accordance with Federal Highway Administration (FHWA) regulations at 23 CFR 771², FHWA's Technical Advisory T6640.8A, FHWA guidance that post dates the Technical Advisory, and the Virginia Department of Transportation's (VDOT) policies and procedures. The preparation of this EA is a continuation of the NEPA process that was initiated on this project in the late-1980s; it does not represent an initiation of that NEPA process anew. Approximately 68% of the right-of-way has been acquired and 70% of the design has been completed for the project covered by this EA, and a portion of the original project was previously broken out and constructed.

The proposed project would provide a new four-lane divided, limited access highway to the west of existing Route 29. Approximately 6.24 miles long, the project would extend from the Route 250 Bypass and the North Grounds of the University of Virginia on the south end to existing Route 29 north of the South Fork Rivanna River on the north end. A connector road into the North Grounds of the University of Virginia, located on the south side of the Route 250 Bypass, which was previously a part of the bypass project, has already been constructed (Leonard Sandridge Road). Access to the new highway would be via interchanges at both ends, with no intermediate access points to crossroads or adjacent properties. The typical cross section would include 12-foot-wide lanes, with shoulders and a variable-width graded median. **Figure 1** shows the location of the project.

1.2 HISTORY/PREVIOUS NEPA DOCUMENTATION

1.2.1 Final Environmental Impact Statement, Record of Decision, 1993

A Final Environmental Impact Statement (FEIS) was completed for this project in 1993 and a Record of Decision (ROD) was signed on April 8, 1993. The Selected Alternative was a

¹ Previous NEPA documentation is available at http://virginiadot.org/projects/culpeper/rt_29_bypass.asp.

² More specifically, this EA is being prepared in accordance with 23 CFR 771.130(c).

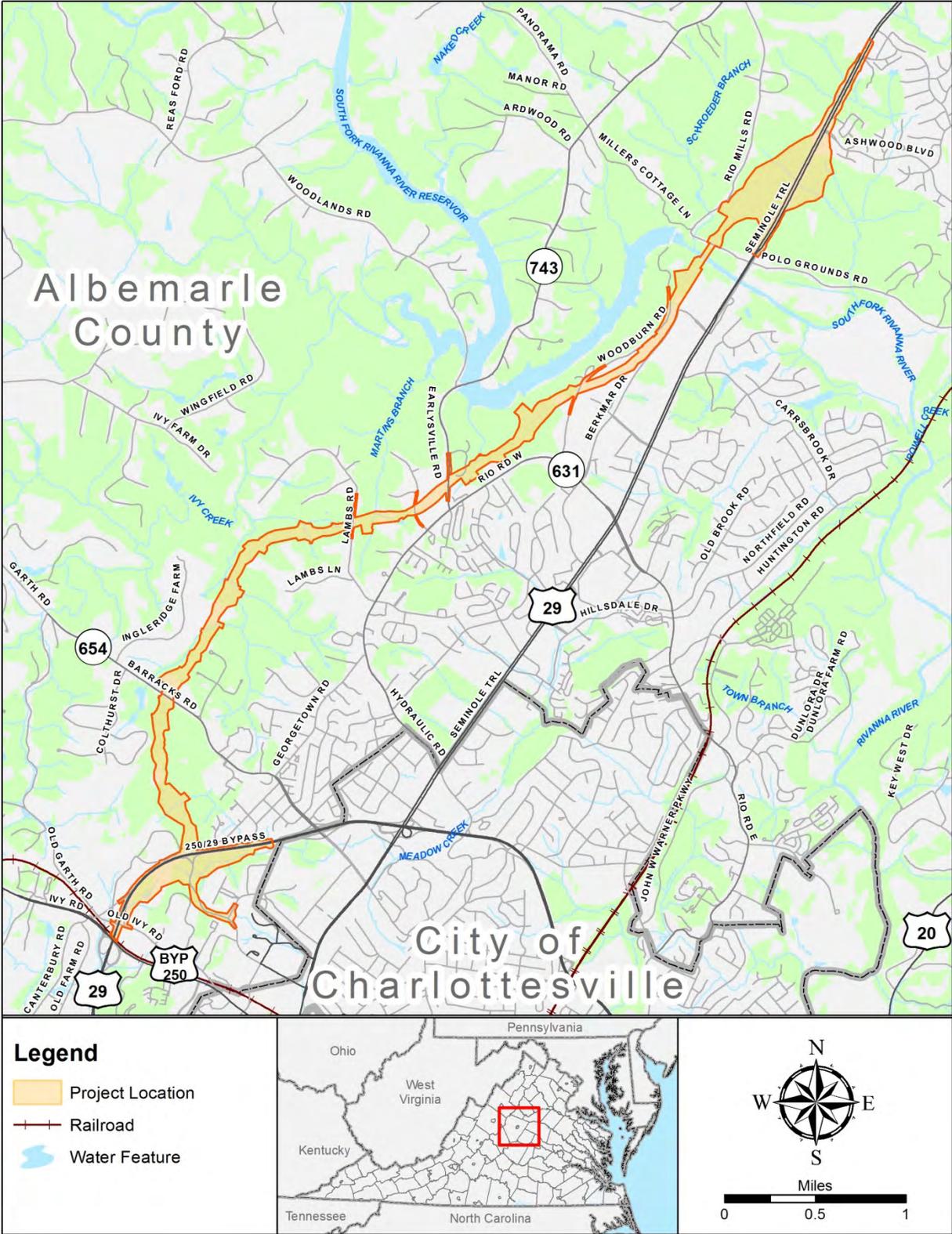


Figure 1. Project Location

combination of short-term, mid-term, and long-term build improvements that were to be implemented in phases:

- For the short term, the “Base Case” widening of Route 29 between Hydraulic Road and the South Fork Rivanna River and access to the North Grounds of the University of Virginia from the Route 250 Bypass. Both of these projects have since been constructed.
- Mid-term improvements were to consist of construction of grade-separated interchanges on existing Route 29 at Hydraulic Road, Greenbrier Drive, and Rio Road. These were subsequently eliminated from the Selected Alternative.
- The long-term improvement was to construct the bypass itself utilizing the Alternative 10 alignment, modified to eliminate interchanges that had been proposed at Routes 654 (Barracks Road) and 743 (Earlsville Road).

1.2.2 Environmental Assessment, Finding of No Significant Impact, 1995

During preparation of the FEIS, businesses were constructed in the area of the northern terminus for the proposed Alternative 10 alignment. Both termini were then altered to avoid impacts to these new businesses as well as the following existing facilities: an African-American family cemetery, a baseball field and parking lot at Agnor-Hurt Elementary School, St. Anne’s-Belfield School, several residences, and University of Virginia facilities. An EA was completed to evaluate the significance of new impacts associated with the revised termini. FHWA issued a Finding of No Significant Impact (FONSI) for the revised termini on July 6, 1995. After the FONSI was completed, the design and right-of-way processes for the bypass were initiated.

1.2.3 Re-Evaluation, Section 4(f) Evaluation, Revised Record of Decision, 2000

When several minor design revisions were being considered, the decision was made to re-evaluate any changes that had occurred on the project since the April 1993 ROD to determine the need for a SEIS. During this process, the Albemarle County School Complex was identified as a Section 4(f) resource. Accordingly, a separate Section 4(f) Evaluation was developed and circulated in February of 1999 in accordance with 23 CFR 771.135(m) (since recodified as 23 CFR 774.9(c)). The Final Section 4(f) Evaluation was approved and both it and the Re-evaluation were signed on March 13, 2000. The Re-evaluation concluded that a SEIS was not warranted. Incidentally, the 1993 ROD identified the Selected Alternative, which was a combination of alternatives analyzed in the FEIS: the Base Case, grade-separated interchanges, and Alternative 10. In February 1995, the Commonwealth Transportation Board revised its location decision that served as the basis for the 1993 ROD, eliminating the grade-separated interchanges or mid-term improvements. With the elimination of the grade-separated interchanges, the selected alternative from the 1993 ROD changed. The revised alternative included a combination of alternatives analyzed in the FEIS: the Base Case and Alternative 10, along with the termini changes addressed in the EA/FONSI dated July 1995. Consequently, the Re-evaluation culminated in a revised ROD, also issued on March 13, 2000, that addressed, in part, the revised selected alternative. The revised ROD replaced the original 1993 ROD.

1.2.4 Final Supplemental EIS, Record of Decision, 2003

Litigation on the project began in 1998 alleging numerous violations of NEPA and other environmental laws. The court determined that FHWA needed to prepare a SEIS to consider more fully the effects of the bypass on the South Fork Rivanna Reservoir and its watershed and the effects of the project’s northern terminus on archaeological resources. The Final SEIS was approved on May 29, 2003. Based on the new information in the SEIS related to impacts on the reservoir and its watershed, a new ROD was issued that identified several mitigation measures to

minimize impacts that the Route 29 Bypass would have on the South Fork Rivanna Reservoir. The ROD was signed on September 22, 2003, and it replaced the revised ROD of 2000.

1.3 NEEDS – EXISTING CONDITIONS

As stated in the 1993 FEIS, “The purpose of the Route 29 Corridor Study is to find a solution to existing and future congestion on a three-mile section of U.S. Route 29 between U.S. Route 250 Bypass and the South Fork Rivanna River in the City of Charlottesville and Albemarle County north of Charlottesville.” The FEIS further noted that Route 29 is the only major north-south highway serving the expanding development north of Charlottesville and surrounding portions of Albemarle County, and that Route 29 is the only major route connecting this development with other population and employment centers in Charlottesville. It also is the only route connecting points north of Charlottesville with points south of Charlottesville. Accordingly, a secondary purpose of the study was identified which was “to complete a gap in ongoing improvements to U.S. Route 29 through Central Virginia.” The FEIS went on to explain how the growing development, rising traffic volumes, and the inadequate capacity of the existing road were increasing congestion as this section of Route 29 had become overloaded. The growing traffic volumes were illustrated in a table (reproduced as **Table 1** below) showing the trend of known volumes through 1987 and the forecasted volumes for 2010.

Table 1. Traffic Growth Trends, Route 29 North of Charlottesville

Year	Hydraulic to Rio Roads	Rio Road to South Fork Rivanna River
1982	34,350	18,105
1983	35,000	18,505
1984	38,755	19,830
1985	41,235	21,835
1986	43,430	23,220
1987	45,990	25,280
2010 (forecast, w/Base Case Constructed)	64,700	52,100

Source: Route 29 Corridor Study FEIS, 1993

By the time the 2003 SEIS was prepared, the Base Case widening, or short-term improvements identified in the 1993 FEIS, had been completed and Route 29 had eight lanes between Hydraulic Road and the South Fork Rivanna River. Current (2011) daily volumes on Route 29 exceed 60,000 just north of Hydraulic Road and 54,000 just south of the South Fork Rivanna River. The section of Route 29 from the Route 250 Bypass to the South Fork Rivanna River serves as the main commercial hub of Albemarle County. There are 13 signalized intersections and 10 unsignalized intersections within this 3.5-mile stretch of Route 29. The posted speed limit is 45 miles per hour. There are approximately 28 curb cuts on the east side of Route 29 and approximately 32 curb cuts on the west side that provide ingress and egress to businesses. Lining Route 29 are four regional shopping centers, multiple big-box stores, gas stations, motels, fast food outlets, restaurants, and grocery stores. Behind the commercial areas are some of the most densely developed residential areas of Albemarle County. These land uses generate traffic on Route 29 and adjacent local streets. Some of this traffic circulates within the corridor and some of it travels beyond the immediate area. Route 29 thus serves as a major thoroughfare providing access to the main commercial and residential areas of Albemarle County.

Since completion of the FEIS and SEIS, substantial new development has occurred along Route 29 to the north between the South Fork Rivanna River and the Greene County Line. This growth is consistent with Albemarle County’s Comprehensive Plan wherein designated growth areas are

identified for purposes of managing development. This development contributes to continuing increases in traffic volumes in the corridor. The Thomas Jefferson Planning District Commission (TJPDC) prepared the *US 29 North Corridor Transportation Study*³ to examine transportation issues in the Route 29 corridor between the Route 250 Bypass and Greene County. The report notes that, because Route 29 is the only available continuous north-south roadway, “all traffic in the north corridor winds up on US 29 regardless of the length or destination of the trip.”

Route 29 has been long identified as part of the State Arterial System, mandated by the Virginia General Assembly to provide multi-lane divided, high-speed highways serving major towns and cities in the state. Route 29 is the only north-south highway linking the urbanized areas through and beyond central Virginia (Danville, Lynchburg, Charlottesville, Culpeper, Warrenton, Fairfax, Falls Church, and Arlington, Virginia; Greensboro, North Carolina; and Washington, D.C.). It provides mobility and vital linkage for economic and personal activities throughout central Virginia, as well as connections to other arterial and interstate routes that enable travel throughout the state and the nation (e.g., I-40 and I-85 in North Carolina; Route 58, Route 460, I-64, and I-66 in Virginia).

The Route 29 corridor has also been designated as a corridor of statewide significance (CoSS) in the 2035 statewide multimodal transportation plan, VTrans 2035. Route 29 is one of eleven corridors that have been designated because of their significance in providing connections to Virginia’s activity centers. The designation is the first step in ensuring that the corridors are invested in and protected for the future benefit of the entire Commonwealth. In these corridors, potential multimodal transportation improvement strategies have been identified to guide local land use planning and transportation investments. VTrans 2035 indicates that the extent to which a locality’s land use plan protects the functionality of the CoSS will be a factor considered in the funding process. Potential strategies for the CoSS include common strategies related to transit and rail improvements and improving the efficiency of the existing system with ITS, access management, improved land use patterns, and travel demand management (TDM) measures. As such, the corridor strategies promote mobility, environmental quality, and sustainable transportation. They will improve accessibility, reduce greenhouse gases and other emissions, improve quality of life with more transportation choices, and support the major population and commercial centers throughout Virginia.

Congress recognized the importance of Route 29 beyond the limits of Charlottesville and Albemarle County by designating the route as part of the National Highway System and also as a Highway of National Significance. However, mobility is reduced by the disruption of flow by traffic signals, by traffic entering and leaving the roadway at numerous intersecting streets and access points serving adjacent properties, and by low operating speeds arising from those conditions. Accordingly, the existing section of Route 29 between the Route 250 Bypass and the South Fork Rivanna River no longer adequately serves the mobility function intended for the State Arterial System and the National Highway System.

1.4 NEEDS – FUTURE CONDITIONS

Using the January 2012 version of the Charlottesville-Albemarle Metropolitan Planning Organization’s (MPO) regional travel demand model, forecasts were developed that show daily traffic volume on Route 29 exceeding 84,000 vehicles per day in 2040. During the peak hours,

³ Meyer, Mohaddes Associates. 2008. *US 29 North Corridor Transportation Study*. Prepared for Thomas Jefferson Planning District Commission.

intersection delays and level of service (LOS)⁴ are expected to deteriorate with the increase in traffic volume. To illustrate the congested conditions, four representative intersections were analyzed. As shown in **Table 2**, under existing conditions, PM peak hour conditions are generally worse than the AM peak hour and two of the four study intersections operate at LOS F in the PM peak. Calculated intersection delays are considerable; these delays create the potential for queues that often extend and spill back to upstream intersections. By 2040, level of service deteriorates to F at the Hydraulic Road intersection in the AM peak as well, with considerable increases in delay in both the AM and PM peaks. The LOS deteriorates to F in the PM peak at the Greenbrier Drive intersection in the PM peak hour, with delay nearly tripling. The LOS at the Rio Road intersection improves in the PM peak as a result of the implementation of a grade-separated interchange, which is funded for construction in the region's current financially constrained long range transportation plan (CLRP). The Hilton Heights Road intersection deteriorates to LOS E in the PM peak.

Table 2. Existing and 2040 No-Build Intersection Delay and LOS

Intersection	Existing				2040 No-Build			
	AM		PM		AM		PM	
	Delay (sec/veh)	LOS						
Route 29 at Hydraulic Road	70	E	120	F	219	F	312	F
Route 29 at Greenbrier Drive	32	C	46	D	44	D	129	F
Route 29 at Rio Road	52	D	156	F	35*	D*	40*	D*
Route 29 at Hilton Heights Road	28	C	48	D	31	C	70	E

* The construction of a grade-separated interchange at Route 29 and Rio Road is programmed in *UnJAM2035*, the region's current financially constrained long range transportation plan. The 2040 No-Build delay and level of service shown here are based on analysis of this location as a single-point urban interchange where the through traffic on Route 29 passes underneath Rio Road and would not be required to stop at a signal. As an at-grade intersection, this location would experience LOS F with delays of 86 and 242 seconds per vehicle in the AM and PM peak hours, respectively.

The need for additional capacity in the Route 29 corridor based on projected travel demand by the year 2040 will increase by approximately 40 percent. The 2003 SEIS stated that with a bypass in place, year "2010 traffic estimates in the FEIS indicated diversions of approximately 16% to 27% of the traffic from existing Route 29." While the absolute volumes are much higher, the current forecasts for 2040 confirm that up to 28% of traffic will divert to the proposed bypass from existing Route 29 between Route 250 Bypass and the South Fork Rivanna River (see Section 2.6 for more details). In addition, the SEIS stated that "by the year 2022, the proposed bypass is projected to carry approximately 24,400 vehicles per day". Projections for the year 2040 completed for this EA show that the bypass would carry approximately 27,800 vehicles per day.

On July 27, 2011, the MPO Policy Board voted to amend *UnJAM2035* (the region's current CLRP) to include the Route 29 Bypass. This project is one of several to address travel needs in the greater Route 29 corridor. Others programmed for construction in the CLRP include widening of existing Route 29 northward from the South Fork Rivanna River to Timberwood

⁴ Level of service (LOS) characterizes the operating conditions on roadway facilities in terms of traffic performance measures related to speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. The Highway Capacity Manual defines LOS at signalized intersections as a function of the average vehicle delay for all vehicles traveling through the intersection: A = ≤10 second delay; B = 10-20 second delay; C = 20-35 second delay; D = 35-55 second delay; E = 55-80 second delay; F = ≥80 second delay.

Boulevard; improvements/extensions to parallel secondary roads (Berkmar Drive, Hillsdale Drive) to expand options for local circulation; a grade-separated interchange at Route 29 and Rio Road; and improvements to the Route 29/Route 250 Bypass interchange.

1.5 SUMMARY

Analyses performed using year 2040 forecasts indicate that the traffic data that forms the basis for the purpose and need of the Route 29 Bypass is consistent with the traffic data from the 2003 SEIS. Projected traffic volumes based on regional estimates of growth in population and employment and the patterns of this growth, as reflected in the regional travel demand model, indicate that traffic volumes on Route 29 north of the Route 250 Bypass are expected to be approximately 40 percent higher than current volumes.

2.1 INTRODUCTION

This section describes the proposed project and, for informational purposes only, summarizes alternatives previously considered. A detailed alternatives analysis is not being conducted anew as a part of this EA. This is because the project has a valid Record of Decision (ROD) from September 2003. Also, this EA is being prepared only to address any new information or circumstances relevant to environmental concerns and bearing on the proposed project and its impacts (e.g., changes to the affected environment and changes to applicable laws and regulations) since completion of previous documents submitted pursuant to the National Environmental Policy Act (NEPA). Notwithstanding, a full range of reasonable alternatives was evaluated and discussed in detail in the FEIS and reviewed in the SEIS. Those documents are hereby incorporated by reference and are available for review at the website address indicated on page 1 of this EA. The No-Build Alternative is also discussed as it serves as a baseline for comparison.

2.2 NO-BUILD ALTERNATIVE

Under the No-Build Alternative, it is assumed that all projects other than the proposed bypass that are funded for construction in the financially constrained long-range transportation plan (CLRP) would be in place by the design year 2040.⁵ The impact of the proposed project on traffic can be isolated using this approach. *UnJAM2035*, the region's current CLRP,⁶ was adopted by the Charlottesville-Albemarle Metropolitan Planning Organization (MPO) Policy Board in May 2009 and amended in July 2011. By programming funds for construction on projects in the CLRP, the state and localities have demonstrated a commitment to implement those improvements. There has been some speculation that some of the improvements currently programmed for construction would not proceed if the 29 Bypass is implemented and that including those projects in the traffic analysis allows the 29 Bypass to show greater benefits than it actually would have. However, there has been no evidence or no indication by the state or localities that any projects currently programmed for construction in the CLRP will be deprogrammed and not pursued. At present, the projects programmed for construction and assumed to be in place by 2040 for purposes of the traffic analysis remain in the CLRP.

Note that the No-Build Alternative presented in this EA differs from the No-Build Alternative evaluated in the 1993 FEIS and 2003 SEIS as it includes projects programmed for construction in the current CLRP that may not have been identified in previous versions. Relevant roadway projects are the Berkmar Drive Extension, the Hillsdale Drive Extension, widening of Route 29 north of the proposed northern terminus of the Route 29 Bypass, improvements to Georgetown Road, a grade-separated interchange at Rio Road and Route 29, and interchange improvements at the Route 29/250 interchange (the locations of these projects are illustrated on **Figure 2**). Also, the design year was 2010 for the 1993 FEIS and 2022 for the 2003 SEIS.

⁵ "Design year" is the future year used to estimate the probable traffic volume for which a highway is designed. FHWA and VDOT policy require that the design year be the projected advertisement date plus 22 years for projects on the National Highway System. Additionally, it is desirable that forecasts be based on the latest planning assumptions for land use, population, and employment. The MPO for the Charlottesville-Albemarle region has updated its planning assumptions and travel forecast model for a horizon year of 2040.

⁶ Link to CLRP: <http://www.tjpc.org/unjam2035/index.asp>.

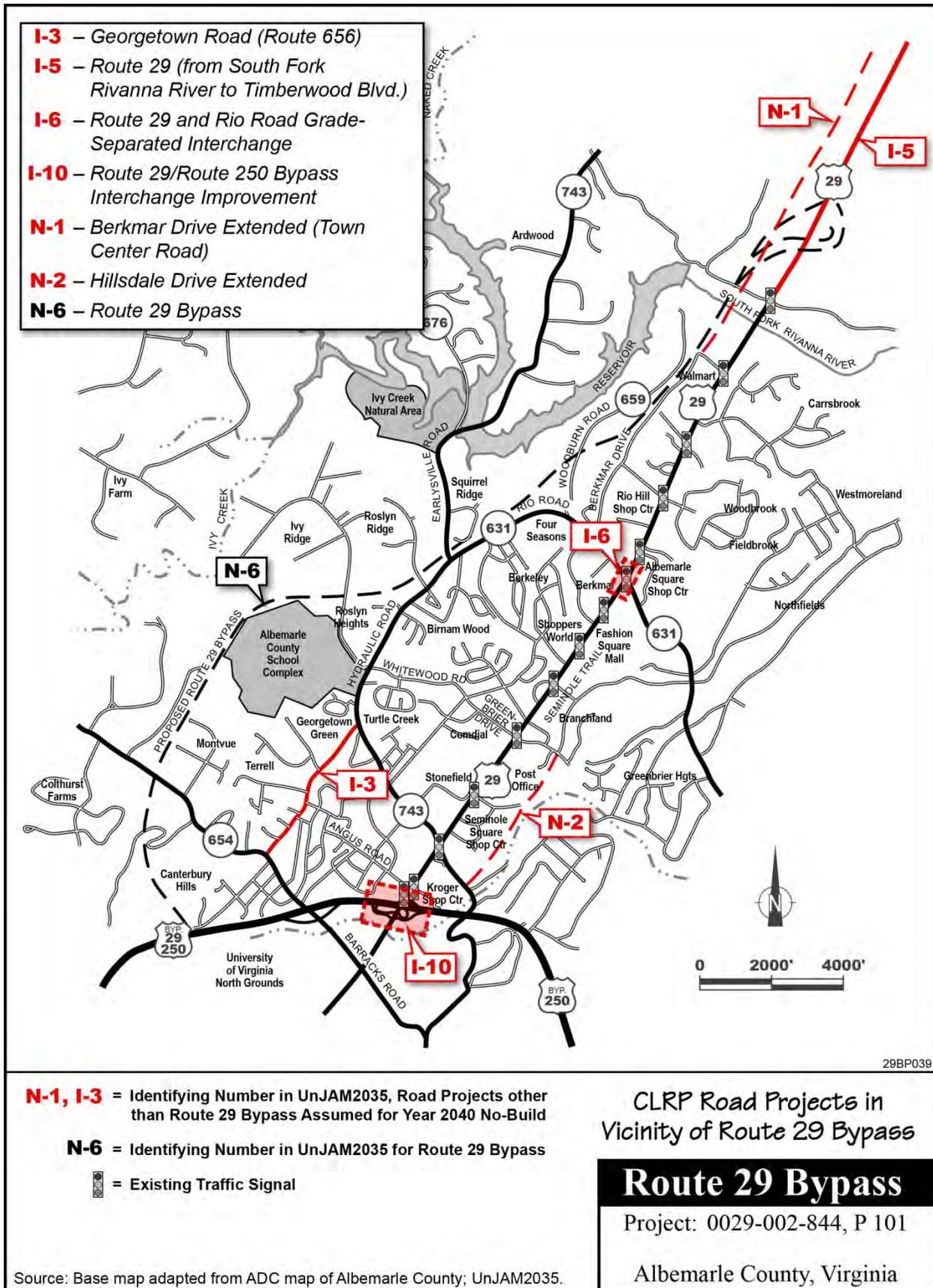


Figure 2. CLRP Road Projects in Vicinity of Route 29 Bypass

2.3 PROJECT DESCRIPTION

The proposed project entails construction of a new four-lane divided limited access highway between Route 250 Bypass on the south and existing Route 29 north of the South Fork Rivanna River. No other interchanges or intersections would be provided between the project termini. The total project length is approximately 6.24 miles. Grade separations would be provided at the crossings of Route 654 (Barracks Road), Route 657 (Lambs Road), Roslyn Ridge Road, Route 743 (Earlsville Road), and Route 659 (Woodburn Road). The short-term improvements to widen Route 29 and to build the North Grounds Connector (now Leonard Sandridge Road) that had been part of the project have since been constructed and therefore are no longer part of the project. The bypass project also includes a number of mitigation measures that were described in the 2003 ROD.

2.4 SUMMARY OF BUILD ALTERNATIVES PREVIOUSLY CONSIDERED

In order to provide context for the proposed project and to respond to comments received during the scoping for this EA that suggested a need for re-initiation of alternatives analyses, a summary of alternatives previously considered is presented. The complete discussion of the various alternatives is available for review in the FEIS and SEIS previously referenced. **Figure 3** shows alternatives previously considered:

- **Alternative 10**, which was selected for implementation and subsequently modified, was the nearest new-location alternative west of existing Route 29. Approximately 5.4 miles long, Alternative 10 did not cross the South Fork Rivanna River Reservoir, but it did cross the Reservoir watershed for approximately 4.2 miles. Alternative 10 was later modified to extend the north end across the South Fork Rivanna, to make adjustments to the southern terminus, and to make other minor alignment and design changes.
- **Alternative 11**, approximately 9.4 miles long, had the same southern terminus as Alternative 10. It crossed the South Fork Rivanna River Reservoir and connected with Route 29 south of the Charlottesville-Albemarle Airport. Among its adverse environmental consequences were the uses of land from two Section 4(f) historic properties (Schlesinger Farm and the Barracks Historic District).
- **Alternative 12**, at a length of approximately 12.9 miles, was the farthest west and the longest of the bypass alternatives described in the FEIS. It had the same southern terminus as Alternatives 10 and 11, crossed the South Fork Rivanna River Reservoir, and connected with Route 29 approximately 0.3 miles south of the North Fork Rivanna River. Among its environmental consequences was the use of nearly 42 acres of land from three Section 4(f) historic properties (Schlesinger Farm, Darby's Folly, and Crenshaw Farm). This alternative also would require the use of approximately 174 acres of agricultural/forestal district land, would cross Ivy Creek where populations of federally listed endangered James spinymussel have previously been recorded, and would destroy the community cohesion of the Ivy Farm subdivision. It also would cross 8.4 miles of the South Fork Rivanna River Reservoir watershed and the Reservoir itself.
- **Alternative 6**, approximately 8.1 miles long, was located east of existing Route 29. Its southern terminus was at Route 250 in the Pantops area east of the Rivanna River and its northern terminus was at Route 29, just north of Route 649 (Proffit Road). Among its environmental consequences would be the use of more than 30 acres of Section 4(f) lands from two publicly owned public parks, including displacement of two athletic fields, two softball fields, and several holes of a golf course.

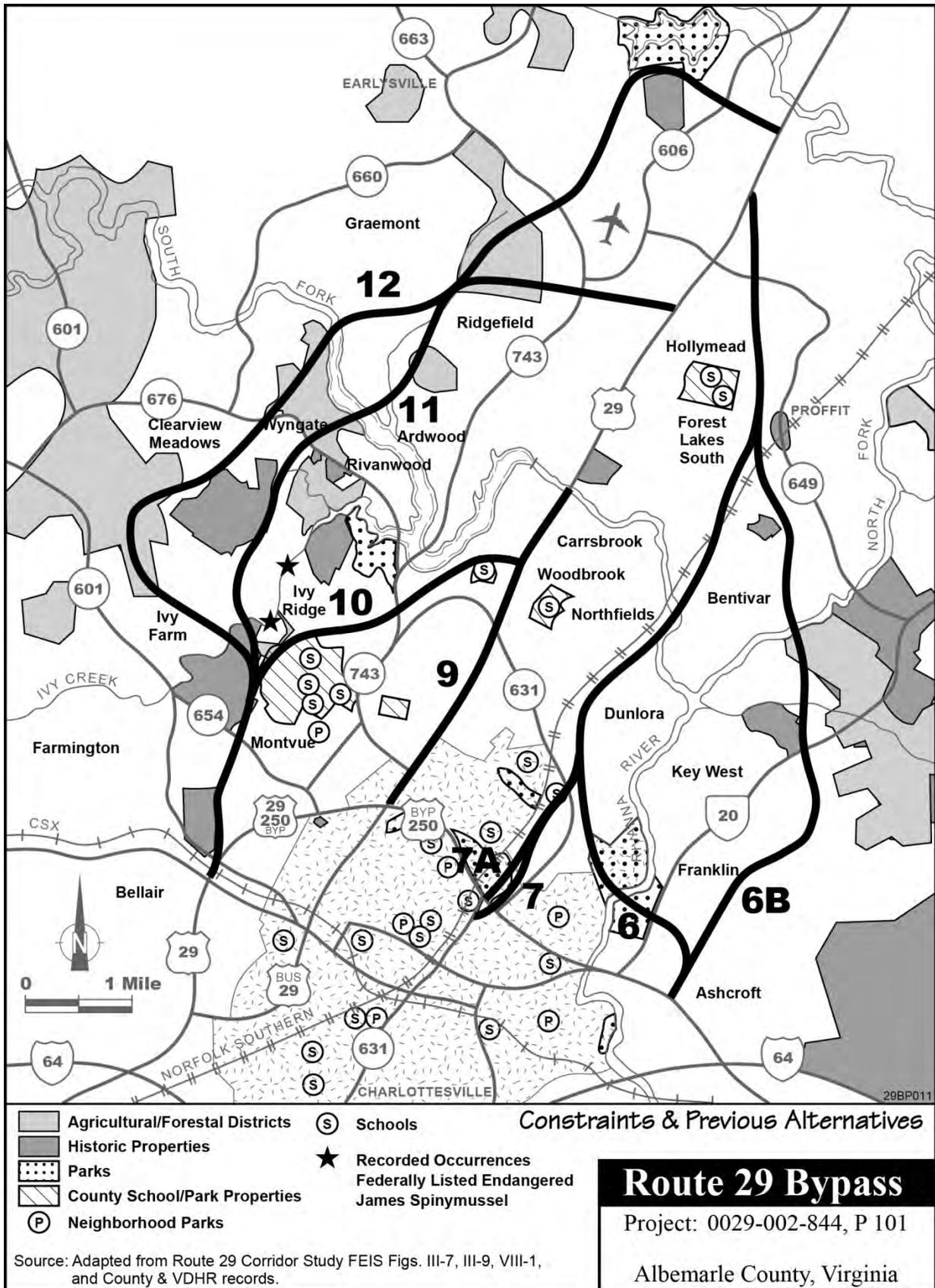


Figure 3. Alternatives Previously Considered

- **Alternative 6B**, approximately 7.8 miles long, had the same termini as Alternative 6, but for most of its length would be located farther east. Alternative 6B was developed to avoid the Section 4(f) impacts of Alternative 6 on Darden Towe Park and Pen Park. Among its environmental consequences would be the use of 16 acres of land from the Section 4(f) historic property, Ridgeway. This alternative also would encroach on the Southwest Mountains Rural Historic District, another Section 4(f) historic property.
- **Alternative 7**, approximately 7.3 miles long, was similar to Alternative 6 between Rio Road (Route 631) and the northern terminus. At its southern end, it would generally follow the planned corridor for the Meadow Creek Parkway,⁷ connecting with a short relocation of McIntire Road south of Route 250 Bypass. It had the same northern terminus as Alternatives 6 and 6B. This alternative avoided passing through McIntire Park.
- **Alternative 7A**, approximately 7.0 miles long, was identical to Alternative 7, except for the southern terminus. Instead of remaining east of McIntire Park, this alternative passed through the eastern third of the park and connected with Route 250 Bypass just opposite McIntire Road. Alternative 7A followed the general corridor planned for the Meadow Creek Parkway. Among its environmental consequences would be the use of approximately 11 acres of Section 4(f) land in McIntire Park and displacement of three holes of the nine-hole golf course.
- **Alternative 9 (Expressway)**, approximately 3.3 miles long, followed the existing corridor of Route 29 from the intersection of Route 250 Bypass to the South Fork Rivanna River. It would consist of two separate roadways totaling 10 lanes: a 50 mph, four-lane, limited access freeway running in the middle of the facility and generally depressed below existing ground level, and northbound and southbound service roads, three lanes each, on each side of the freeway. The construction of this alternative would severely disrupt traffic movements for several years and would interrupt access to businesses. Maintenance of traffic during construction also would be complicated and costly. This alternative was strongly opposed by the local business community and, as reflected in the City's resolution against an interchange at Hydraulic Road, also would be unacceptable to the City of Charlottesville.
- **Base Case with Grade-Separated Interchanges** would involve adding three grade-separated interchanges to the now-completed Base Case improvements on existing Route 29. The interchanges would be at Hydraulic Road, Greenbrier Drive, and Rio Road. Each interchange would be constructed in a tight urban diamond configuration to achieve the least impact to adjacent businesses. The three interchanges originally were included as part of the overall selected improvements (in addition to the Alternative 10 Bypass), but they were subsequently eliminated. Now, the current CLRP includes an interchange at Rio Road.

2.5 DEVELOPMENT OF UPDATED TRAFFIC FORECASTS

Traffic forecasts in the 1993 FEIS were reported for a design year of 2010. In the 2003 SEIS, the forecasts were updated to a design year of 2022. As a part of this EA, the traffic forecasts were updated to incorporate the latest regional planning assumptions and a design year of 2040.

The forecasting efforts were based on the January 12, 2012 version of the regional travel demand model as provided by the MPO. The MPO's model reflects substantial updates to the traffic

⁷ The Meadow Creek Parkway has been completed between Rio Road and Melbourne Road; the section between Melbourne Road and Route 250 Bypass is under construction; the interchange of the Meadow Creek Parkway with Route 250 Bypass is in design.

analysis zone (TAZ) structure and transportation network coding. Updated population and employment data included in the model were approved by the MPO Policy Board in September 2011.⁸ The model reflects a revised horizon year of 2040 and is coded with all transportation improvements included in *UnJAM 2035*, the region's current CLRP. A detailed discussion of the modeling methodology is provided in the *Traffic and Transportation Technical Report*.

2.6 ABILITY OF PROJECT TO MEET NEEDS

The proposed project would relieve congestion on the three-mile section of U.S. Route 29 between U.S. Route 250 Bypass and the South Fork Rivanna River by providing additional north-south highway capacity and diverting traffic from the existing road to the new parallel road. The new parallel road is forecast to carry just under 28,000 vehicles per day in design year 2040. Much of this volume would shift from existing Route 29, resulting in reductions of daily traffic volumes on existing Route 29 of up to 28 percent. **Table 3** shows the estimated volumes of traffic diverted from existing Route 29 to the proposed Route 29 Bypass as forecast by the MPO's regional travel demand model.

Table 3. Comparison of 2040 No-Build and Build Daily Volumes on Existing Route 29

Roadway	Segment	2040 Daily Forecasts (two-way)		Difference	
		No-Build	Build	Volume	Percentage
Route 29 (Seminole Tr)	North of Rt 29 Bypass Interchange	66,600	74,900	8,300	13%
Route 29 (Seminole Tr)	Rt 29 Bypass to Polo Grounds Rd	73,100	65,500	-7,600	-11%
Route 29 (Seminole Tr)	Polo Grounds Rd to Hilton Heights Rd	75,700	63,600	-12,100	-16%
Route 29 (Seminole Tr)	Woodbrook Dr to Carrsbrook Dr	76,700	64,500	-12,200	-16%
Route 29 (Seminole Tr)	Woodbrook Dr to Rio Rd	81,100	68,600	-12,500	-16%
Route 29 (Seminole Tr)	Rio Rd to Berkmar Dr	66,000	51,200	-14,800	-23%
Route 29 (Seminole Tr)	Berkmar Dr to Dominion Dr	80,400	58,500	-21,900	-28%
Route 29 (Seminole Tr)	Dominion Dr to Greenbrier Dr	84,400	63,000	-21,400	-26%
Route 29 (Seminole Tr)	Greenbrier Dr to Hydraulic Rd	83,300	67,800	-15,500	-19%
Route 29 (Emmet St)	Hydraulic Rd to Angus Rd	83,300	63,100	-20,200	-25%
Route 29 (Emmet St)	Angus Rd to Route 250 Byp	85,900	65,600	-20,300	-24%
Emmet Street	Route 250 Byp to Barracks Rd	53,800	53,100	-700	-2%
Route 250 Bypass	Emmet St to Barracks Rd	58,700	40,700	-18,000	-31%
Route 250 Bypass	Barracks Rd to Rt 29 Byp	70,700	53,200	-17,500	-25%
Route 29	Fontaine Ave to Ivy Rd	67,500	69,500	2,000	3%
Route 29 Bypass	North interchange (Rt 29) to South interchange (Rt 250 Byp)	N/A	27,800	N/A	N/A

Note: Volumes have been rounded to the next 1, and percentages have been rounded to the nearest integer.

It is expected that motorists in the region will shift their trip paths to make use of the proposed Bypass as they seek the shortest time for their overall trips. Travel demand models seek to replicate these real-world shifts. Shifts from the existing Route 29 to the Route 29 Bypass between the northern terminus of the Bypass with Route 29 and the southern terminus of the

⁸ Minutes of September 28, 2011 MPO Policy Board Meeting can be accessed at: http://www.tjpc.org/agendas_and_minutes/mpoPoli/Min_MPOPolI_11_09_28.pdf

Bypass with Route 250 are to be anticipated; changes in motorist travel paths also mean that traffic shifts may occur beyond the project's immediate area. As shown in Table 3, the section of Route 250 Bypass west of the southern terminus of the Bypass is expected to experience an increase in traffic volume based on changes in motorist paths that affect areas that extend beyond the immediate project area. The projected increase in traffic volume on Route 29 north of the northern terminus of the proposed Bypass is partially attributable to this effect, but is also affected by the fact that the Berkmar Drive Extension is included in both the No-Build and Build Conditions; the Bypass is expected to shift some traffic back from Berkmar Drive Extended to Route 29 in order to make use of the Bypass. Shifts in traffic from one route to another also can affect levels of congestion on particular roadways, resulting in additional traffic shifts as motorists throughout the system seek to minimize their travel times. The travel demand model reflects these complex dynamics of travel behavior as well as the ways in which various roadways such as the proposed Bypass and the programmed Berkmar Drive Extension interact with each other in the 2040 horizon year.

Traffic using the proposed Route 29 Bypass would be able to travel at high speed (posted speed limit will be 55 mph) with no delays because there would be no intermediate intersections or interchanges with cross streets to interrupt the free flow of traffic. Additionally, by diverting traffic from existing Route 29, the average delay per vehicle at intersections on existing Route 29 would be reduced when compared to the No-Build Alternative. Illustrative examples are provided in **Table 4**. For example, at the Route 29/Hydraulic Road intersection, average delay per vehicle would be reduced by approximately 42% in the AM peak and by approximately 35% in the PM peak. In some cases, the intersection level of service letter grade also would improve.

Table 4. 2040 No-Build and Build Intersection Delay and LOS

Intersection	2040 No-Build				2040 Build			
	AM		PM		AM		PM	
	Delay (sec/veh)	LOS						
Route 29 at Hydraulic Road	219	F	312	F	126	F	202	F
Route 29 at Greenbrier Drive	44	D	129	F	47	D	126	F
Route 29 at Rio Road	35*	D*	40*	D*	36*	D*	38*	D*
Route 29 at Hilton Heights Road	31	C	70	E	24	C	44	D

* The construction of a grade-separate interchange at Route 29 and Rio Road is programmed in *UnJAM2035*, the region's current financially constrained long range transportation plan. The delay and level of service shown here are based on analysis of this location as a single-point urban interchange where the through traffic on Route 29 passes underneath and would not need to stop at a signal.

Substantial new development has occurred along Route 29 to the north of the northern terminus of the proposed project, which is consistent with Albemarle County's Comprehensive Plan and development policies aimed at steering development to designated growth areas. Likewise, new development is occurring along Route 29 between Route 250 Bypass and the South Fork Rivanna River (such as the 65-acre commercial/residential Stonefield development at the intersection of Route 29 and Hydraulic Road). The additional traffic oriented to Route 29 that is generated by this new development contributes to the ongoing growth of traffic volumes between the Route 250 Bypass and the South Fork Rivanna River. The absence of alternative routes, other than discontinuous local streets, renders Route 29 increasingly overloaded with traffic. Given the County's development policies that will continue to steer growth to the Route 29 corridor, the traffic volumes on Route 29 are expected to continue to increase, as reflected in the traffic forecasts described above.

Regional and local planning efforts have studied the need to accommodate growing traffic volumes on Route 29 north of the South Fork Rivanna River. For example, in 2008, the Thomas Jefferson Planning District Commission (TJPDC) completed the *US 29 North Corridor Transportation Study* to develop a context-sensitive, multimodal transportation plan for the Route 29 corridor from the Route 250 Bypass north to the Greene County Line. This effort was followed by the development of *Places29: A Master Plan for the Northern Development Areas (Places29)* by Albemarle County. Both planning efforts led to the identification of potential transportation improvements to expand capacity in the corridor. Some of these improvements have been included in the CLRP. Such projects include the Berkmar Drive Extension, the study of which was initiated in November 2009 after the MPO Policy Board requested that TJPDC staff analyze the traffic impacts of extending Berkmar Drive, as recommended in *Places29*. The Berkmar Drive Extension Study was completed in May 2010, and the extension of the existing roadway from its northern terminus at Hilton Heights Road to Lewis and Clark Drive (approximately five miles to the north), including a new bridge over the South Fork Rivanna River, is included in the current CLRP. [It should be noted that the proposed Berkmar Drive Extension parallels a portion of the proposed Route 29 Bypass and that the design of the Route 29 Bypass and the Berkmar Drive Extension may need to be coordinated to avoid conflicts. However, unlike the proposed Route 29 Bypass, Berkmar Drive intersects existing Route 29 south of Rio Road and does not provide an alternate route for traffic travelling to the University's North Grounds or to Route 250 Bypass west and Route 29 south of Charlottesville.] The CLRP also includes the widening of Route 29 from four to six lanes between the South Fork Rivanna River and Airport Road.

Regional and local planning efforts also have resulted in identification of potential transportation improvements other than the proposed Route 29 Bypass to help address travel needs in the Route 29 corridor between Route 250 Bypass and the South Fork Rivanna River. The CLRP now includes a grade-separated interchange on existing Route 29 at Rio Road, interchange improvements at Route 29 and Route 250 Bypass, an extension of Hillsdale Drive (a local street paralleling Route 29 on the east within commercial and residential areas), and spot improvements on Georgetown Road. While these additional projects are helpful in addressing overall travel needs in the corridor, they do not provide the same level of congestion relief that would be provided by the proposed Route 29 Bypass, nor do they provide a limited-access highway that offers higher speeds and uninterrupted free flowing travel consistent with the arterial functions of Route 29. The MPO's resolution including the Route 29 Bypass project in the CLRP "recognizes that U.S. 29 north is both a state and local road and must accommodate the needs of both state and local traffic." Route 29 is an arterial roadway, and as stated in the Transportation Section of the Albemarle County Comprehensive Plan, "the primary purpose of these roads is to move traffic; access to properties is considered a lower function/priority." In addition, as per the following transportation guiding principal from *Places29*, "An efficient, effective, and accessible transportation system will serve users across the entire spectrum, from local trips to regional ones, ... improvements to the US 29 corridor should recognize and address the road's multiple purposes." One purpose of Route 29 is to provide mobility and linkage for economic and personal activities throughout central Virginia, as well as connections to other arterial and interstate routes that enable travel throughout the state. Currently, Route 29 between Route 250 Bypass and the South Fork Rivanna River does not adequately serve the mobility function intended for the State Arterial System and the National Highway System.

Based on the above, the proposed Route 29 Bypass continues to meet the identified purpose and need as described in previous NEPA documents and as updated in this EA. Specifically, the

project would address existing and future congestion on the three-mile section of U.S. Route 29 between U.S. Route 250 Bypass and the South Fork Rivanna River in the City of Charlottesville and Albemarle County north of Charlottesville. The traffic forecasts from the MPO's regional travel model show almost 28,000 vehicles per day using the route in the year 2040. Volumes of this magnitude indicate that the proposed Bypass would provide an attractive parallel alternative highway route to existing Route 29. Further, the limited access features of the project and the absence of any at-grade intersections, traffic signals, or driveways would better serve the mobility function intended for the State Arterial System and the National Highway System, of which Route 29 is a part.

3.1 INTRODUCTION AND OVERVIEW OF ENVIRONMENTAL ISSUES

As discussed in Section 1, the record of environmental documentation of this project is extensive. Notwithstanding the previous studies, FHWA regulations require re-evaluation of a Final Environmental Impact Statement (EIS) "before further approvals may be granted if major steps to advance the action (e.g., authority to undertake final design, authority to acquire a significant portion of the right of way, or approval of the plans, specification and estimates) have not occurred within three years after the approval of the final EIS, final EIS supplement, or the last major Administration approval or grant." Major steps to advance the action were stalled after the final supplemental EIS was completed in 2003 because the Charlottesville-Albemarle Metropolitan Planning Organization (MPO) would not allow any additional funding to be added to the project to complete preliminary engineering or right of way or allow funding for construction to be placed on the project in the financially constrained long-range transportation plan (CLRP). However, the MPO on July 27, 2011 passed a resolution amending the CLRP to include funding of the U.S. Route 29 Bypass.

FHWA conducted a re-evaluation and concluded that additional environmental studies would need to be completed before a determination could be made whether the previous NEPA documentation and decisions for the Route 29 Bypass remain valid and to determine if new information or circumstances may result in significant environmental impacts not already considered, triggering the need for a supplemental EIS. Pursuant to 23 CFR 771.130, FHWA has the authority to use an EA as an appropriate tool to determine the need for a supplemental EIS.

Accordingly, this section of the EA describes new information or circumstances relevant to environmental concerns that may have a bearing on the proposed action or its impacts. The scope of issues addressed in this section was identified primarily by review of comments received through early coordination with federal, state, regional, and local agencies likely to have an interest in the project (see Section 4). In addition, a review of issues raised by citizens commenting at the public meeting hosted by the MPO in July 2011 before that body took action to amend the CLRP to include the project (a FHWA representative attended the meeting); a review of unsolicited letters on the project from the public, environmental groups, and other organizations; and a review of the project area and associated mapping and other data sources were used to inform the scope of the discussion and analysis.

Figure 4 shows the project corridor (proposed right of way and limited access line which encompasses the potential construction limits) as depicted on the current design plans. The aerial photobase mapping is from March 2012.

Table 5 below summarizes environmental issues as they pertain to the project, noting whether new information or circumstances have been identified, indicating methods of review or analysis for each resource category, indicating whether impacts have changed, and providing commentary where appropriate. **Table 6** includes mitigation measures for specific resources and provides information on commitments that have been made through the completion of the 2003 SEIS and ROD to minimize impacts of the project. Issues requiring further discussion or expanded analysis are addressed following the tables. No other project or design changes since completion of the 2003 Supplemental EIS have been committed to at this time. Therefore, all new information or circumstances are related to changes in the affected environment or regulatory

changes. It should be noted that the portion of the project represented by the short-term improvements to widen Route 29 have been completed and the portion of the project located at the southern terminus formerly known as the North Grounds Connector (now called Leonard Sandridge Road) was broken out from the Route 29 Bypass project and constructed separately.

It is also noted that concepts for the southern and northern interchanges dated September 2011 are posted on the VDOT website for the project⁹ that are different from what was previously presented to the public or included in the 2003 SEIS. These concepts were developed by VDOT solely for discussions with the Northern Interchange Task Force, a group convened by a member of the Albemarle County Board of Supervisors to provide advice during VDOT's development of a Request for Proposals (RFP) for a design-build contract for the project. Discussions also were held by VDOT with the Jack Jouett Bypass Advisory Committee, a group formed by another Albemarle County Supervisor. The concepts were to illustrate to the groups other potential configurations for an interchange that could still be contained within the proposed right-of-way envelope previously presented to the public in the SEIS. They were not meant to convey any intent to modify the design or otherwise go forward with these as a proposed design or designs for this portion of the project. Again, they were for illustrative purposes only.

The RFP explicitly stated that "The Offeror's proposed design shall not exceed the right-of-way limits indicated in the RFP plans." The RFP plans were the same as those presented in the SEIS. Offerors were invited to submit proposals to include, among other items, conceptual plans meeting design criteria specified in the RFP. These conceptual plans do not represent final design plans. In fact, final design activities are precluded by law until the NEPA process (i.e., this EA) is completed (23 CFR 771.113).

Finally, it is noted that VDOT has entered into a design-build contract with a contractor as a result of the Request for Proposals mentioned above. VDOT will be utilizing a two-phased Notice to Proceed (NTP) for the project as defined in the design-build contract. The two-phased approach meets the requirements of Title 23 CFR § 636.109(a)(5), which permits the contracting agency to issue notice to proceed with preliminary design pursuant to a design-build contract that has been awarded prior to the completion of the NEPA process. Pursuant to Title 23 CFR § 636.109(b)(3), the design-build contract for this project includes provisions preventing the design-builder from proceeding with final design activities and physical construction prior to the completion of the NEPA process. FHWA concurred in the contract award and authorized VDOT to proceed with preliminary design activities.

While certain details of the roadway design may change during the final design process, as they do in any project, and although the nature of such potential changes are not known at this time, the major design features of the project (typical cross-section and corridor location) are not expected to materially change. Nor is the right-of way footprint upon which previous environmental analyses were based expected to change. Therefore, the design upon which the SEIS was based best represents the current project design, and its associated right-of-way footprint best represents the direct impacts footprint of the proposed project, and environmental impacts have been computed accordingly.

⁹ http://www.virginiadot.org/projects/culpeper/rt_29_bypass.asp

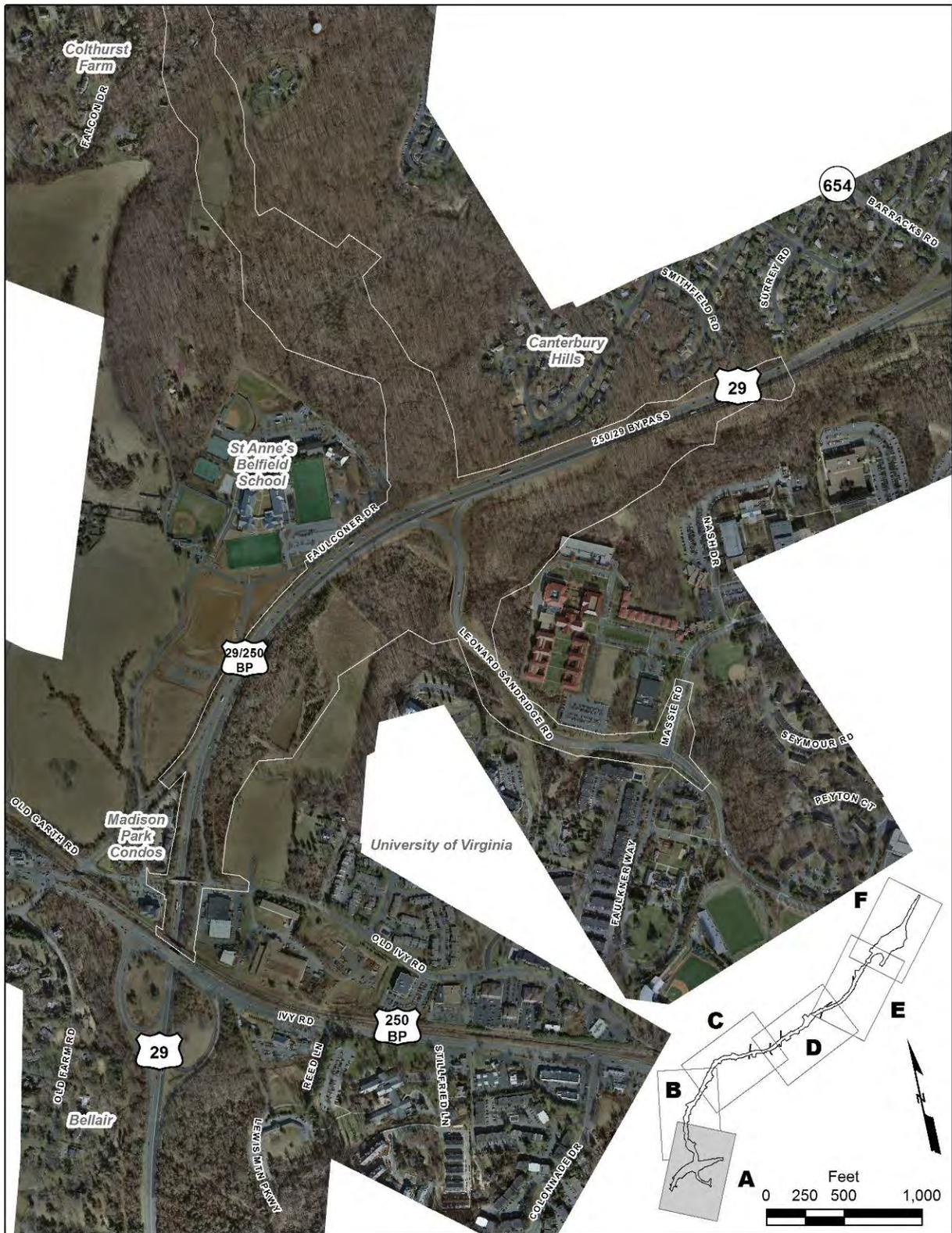


Figure 4A. Project Corridor (Sheet A)

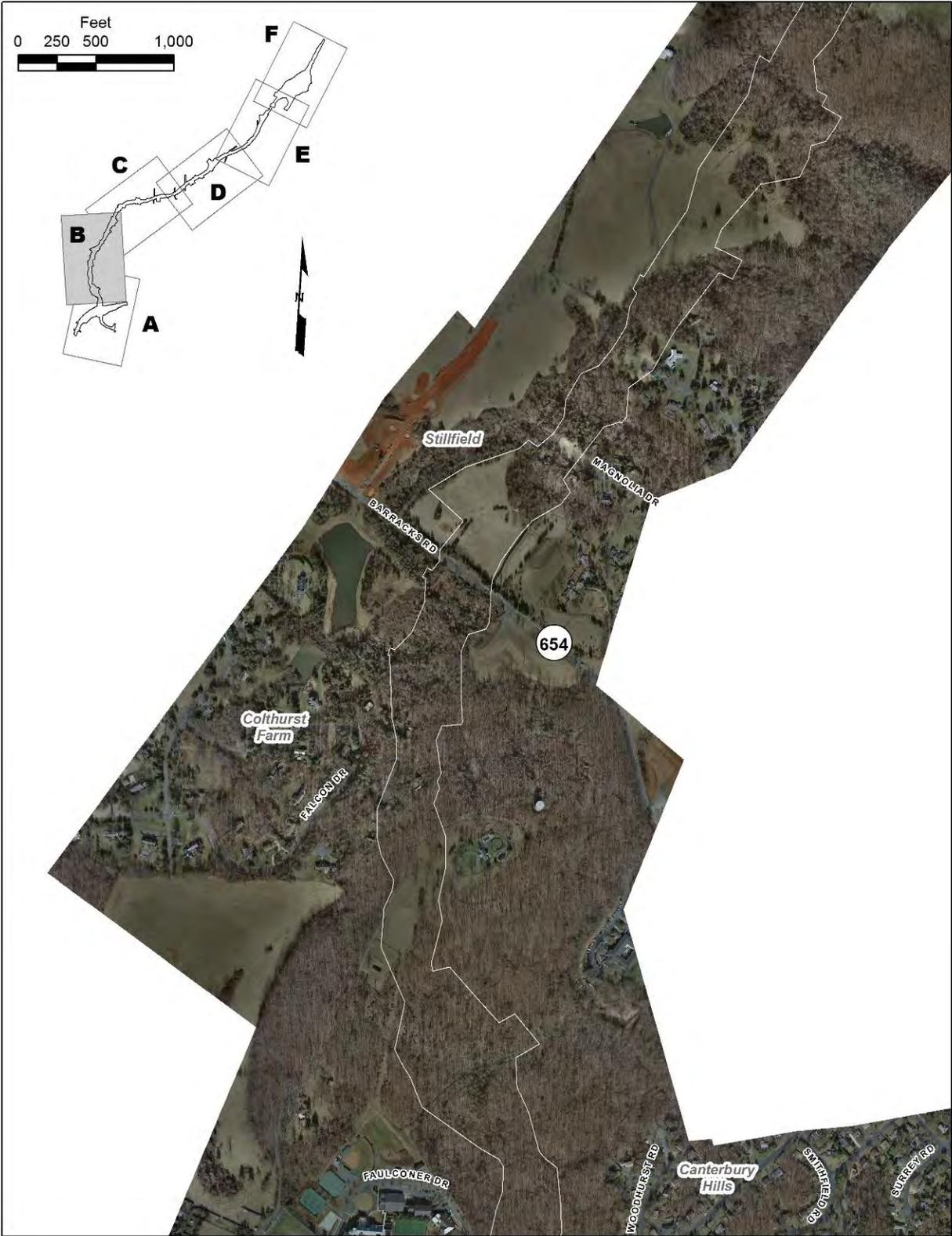


Figure 4B. Project Corridor (Sheet B)



Figure 4C. Project Corridor (Sheet C)



Figure 4D. Project Corridor (Sheet D)



Figure 4E. Project Corridor (Sheet E)

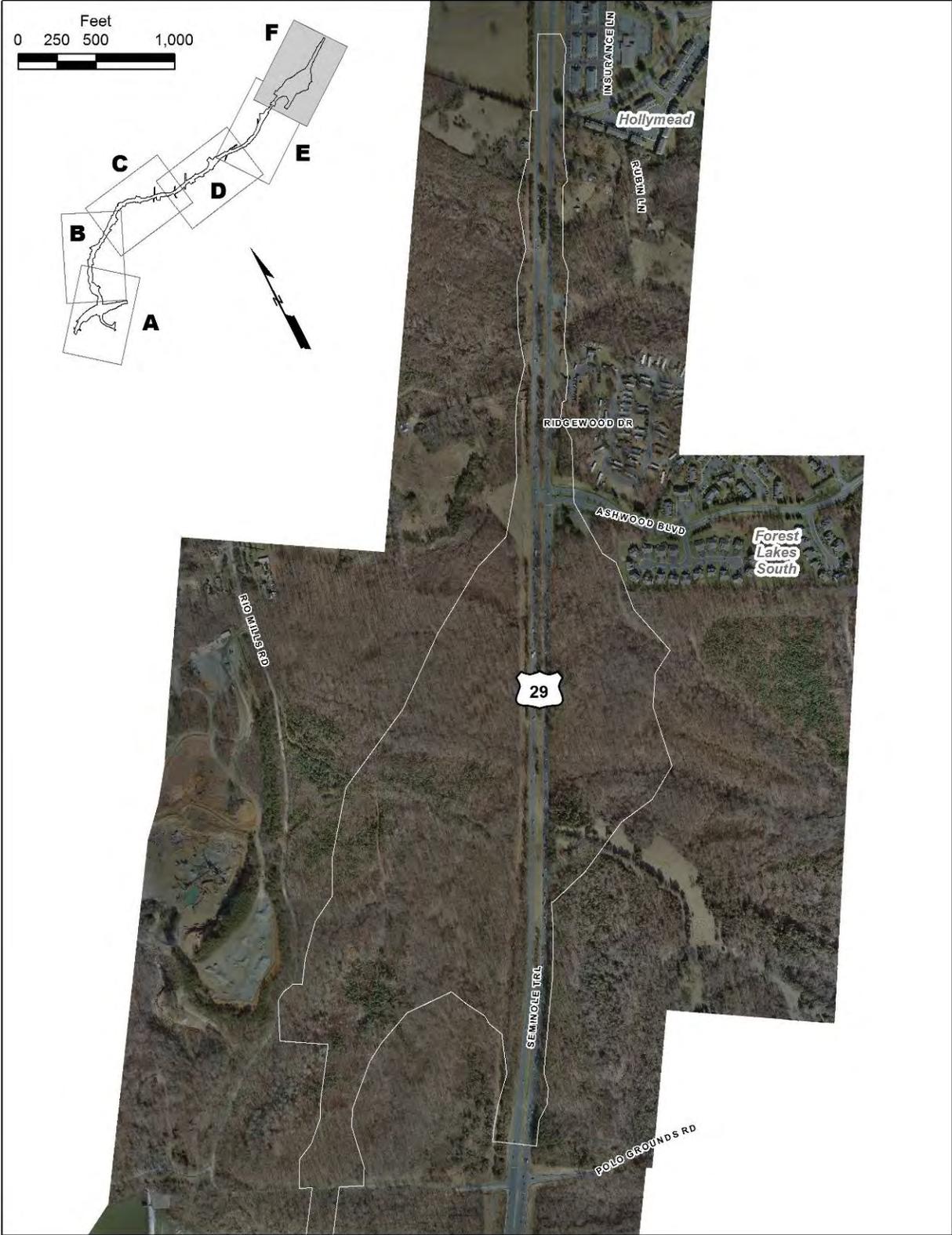


Figure 4F. Project Corridor (Sheet F)

Table 5. Summary of Environmental Issues

Issue / Resource	New Information?	Method of Review	Have the Impacts Changed?	Comment
Transportation				
Traffic	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	--Review of previous traffic studies and NEPA documentation. Update forecast.	Yes.	The traffic forecast was updated to incorporate the latest regional planning assumptions and extend the design year to 2040 (see <i>Traffic and Transportation Technical Report</i>). The MPO's January 12, 2012 version of the regional travel demand model was used, which reflects updates to the traffic analysis zone (TAZ) structure, transportation network coding, and population and employment data. The model reflects a revised horizon year of 2040 and is coded with all transportation improvements included in <i>UnJAM 2035</i> , the region's current CLRP. Updated traffic data are included in Sections 1 and 2 of this EA. New projects funded for construction in the CLRP, which are noted in Section 2 of this EA, are accounted for in the forecast. The Forecasted daily traffic volume on the bypass for 2040 is approximately 14% greater than the previous forecast for 2022.
Transportation Plan	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	--Review MPO's current Long Range Transportation Plan. Review Albemarle County Comprehensive Plan, <i>Places29 Master Plan</i> , <i>29 North Corridor Transportation Study</i> , <i>Berkmar Drive Extension Study</i> .	Yes.	
Land Use				
Land Use Conversion	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Review of previous NEPA documentation; recent aerial photos; current Albemarle County Comprehensive Plan; zoning and land use ordinances; BOS meeting minutes, and actions; field review.	No.	Land uses within the proposed project right of way footprint have not changed.
Development	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		Yes.	Additional development has occurred at the southern terminus (within UVA's North Grounds and at the private St. Anne's Belfield School); along the existing Route 29 corridor between the project termini, beyond the northern terminus (in areas designated by the County for growth), and within the South Fork Rivanna Reservoir watershed. See Section 3.2 .
Local Comprehensive Plan	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		No.	Since completion of the SEIS, Albemarle County has amended its Comprehensive Plan, adopted <i>Places29: A Master Plan for the Northern Development Areas</i> , and adopted a <i>Rural Areas Plan</i> . The Route 29 Bypass continues to not be explicitly included in these locally adopted plans, although its alignment continues to appear on some land use maps in the Comprehensive Plan. The

Table 5. Summary of Environmental Issues

Issue / Resource	New Information?	Method of Review	Have the Impacts Changed?	Comment
				<p>County Board of Supervisors adopted a resolution on 09/14/2011 concurring with the MPO amendment to their TIP and CLRP on 07/27/2011 to remove language opposing the allocation of funding to the proposed Route 29 Western Bypass, and requested updated data and impact analyses.</p> <p>The 2007 Charlottesville Comprehensive Plan notes that Route 29 plays a prominent role as a regional and state-wide thoroughfare; however, this project is not specifically identified in the plan. Even though the Route 29 Bypass is not consistent with <i>Places29</i>, the County Board of Supervisors, which approved <i>Places29</i>, also granted the necessary approvals to the Route 29 Bypass that allowed it to be reopened. Likewise, the Albemarle County representatives on the MPO provided the necessary support to add funding to the project in the TIP and CLRP that has allowed the project to move forward.</p>
Populations & Services				
Populations	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Review of 2000 and 2010 Decennial US Census and 2010 American Community Survey data and MPO model inputs. Review of previous NEPA and Section 4(f) documentation. Review of aerial mapping, County planning documents, and correspondence from local officials and others.	No.	Total population in Albemarle County increased by 30,930 people between 1990 and 2010, or 45%. For the Charlottesville-Albemarle region in 2040, the population is anticipated to be 188,610 persons (an increase of 59 percent from the 2010 population of 118,546), and the employment is anticipated to be 117,191 jobs (an increase of 55 percent from the 2010 employment of 75,563).
Emergency Services	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		No.	
Public Facilities	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		No.	The Albemarle County School Complex (Albemarle High School, Jack Jouett Middle School, Mary C. Greer Elementary School, and the Ivy Creek School (Piedmont Regional Education Program School) are adjacent to the bypass alignment south of Lambs Road. The Complex is designated in the Albemarle County Community

Table 5. Summary of Environmental Issues

Issue / Resource	New Information?	Method of Review	Have the Impacts Changed?	Comment
				Facilities Plan as a district park. After school hours, the facilities at the Complex provide a variety of recreational activities such as tennis, field sports, and walking. Agnor-Hurt Elementary School is situated between Woodburn Road and Berkmar Drive just south of the bypass alignment. This school property also functions as a community park under the County's Community Facilities Plan. The relationship between the location of the proposed bypass and the schools has not changed from the previous environmental documentation.
Private Facilities	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		No.	Residents of The Colonnades, a senior living community located at 2600 Barracks Road, have expressed concern about the impact of the bypass on their quality of life. The road, as proposed, would be located more than 1,000 feet from facilities at the Colonnades and would be located on the other side of Stillhouse Mountain from where the proposed bypass would cross Barracks Road (effectively screening the community from the roadway). In addition, the road would be located below the elevation of the facility (approximately 10 feet at its closest point and up to 40 feet at its furthest point) and be separated by a wooded area.
Relocation Impacts				
Potential Relocations	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Review of previous NEPA documentation and current design.	No.	68% of the right-of-way parcels needed for the project have already been acquired and the relocations carried out in the late 1990s. Currently, VDOT is managing the properties that have been acquired. Additional relocations beyond those already identified are not anticipated because of the project.
Business Relocations	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		No.	
Environmental Justice Populations	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Review of 2000 and 2010 Decennial US Census and 2010 US Census American Community Survey data. Review of	No.	No minority or low-income populations have been identified in the vicinity of the project let alone populations that would suffer disproportionately high and adverse environmental effects due to the project.

Table 5. Summary of Environmental Issues

Issue / Resource	New Information?	Method of Review	Have the Impacts Changed?	Comment
		previous NEPA documentation. Review of FHWA Order 6640.23A dated 6/14/12 regarding compliance with EO 12898.		
Visual and Aesthetics				
Visual and Aesthetics	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Review of previous NEPA documentation and Virginia Department of Conservation and Recreation (VDCR) list of State Scenic Rivers.	No.	--The South Fork Rivanna River is designated a State Scenic River south of the reservoir. However, the visual impacts at the river crossing have not changed. --In the vicinity of the Colonnades, the Albemarle County School Complex, and Agnor-Hurt Elementary School, the road would be constructed in a cut or below the grade of these facilities, which is consistent with previous environmental documentation.
Farmlands				
Farmlands	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Review of DEIS, FEIS, SEIS, aerial mapping, soils mapping, and engineering plans and design refinements.	Yes.	A disjunct parcel of the Ivy Creek Agricultural and Forestal District, a state and local designation program, has been withdrawn from the District. Accordingly, the Agricultural and Forestal District impact previously identified will not occur.
Noise and Vibration				
Noise Criteria	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Review of FHWA regulations.	Yes.	FHWA issued new noise regulations effective July 13, 2011 (<i>Procedures for Abatement of Highway Traffic Noise and Construction Noise</i> , 23 CFR 772). See Section 3.3.
Existing Noise Conditions	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Conducted noise monitoring at noise-sensitive receptors.	Not Applicable.	
Noise impacts	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Review previous noise studies. Conduct new noise modeling and analysis	Yes.	Design year build noise levels are predicted to exceed the NAC at 56 residential land uses and athletic fields associated with the Jack Jouett Middle School and Agnor-Hurt Elementary School. Under the previous

Table 5. Summary of Environmental Issues

Issue / Resource	New Information?	Method of Review	Have the Impacts Changed?	Comment
				noise analysis, 55 residential land uses and a school sports field were predicted to be impacted. Preliminary noise abatement measures (e.g., noise barriers) were found to achieve feasible reductions at the majority of the impacted receptors; however, none of the evaluated barriers were found to satisfy VDOT's reasonableness criteria. Additional studies will be necessary during the final design phase when more detailed design information is available. See Section 3.3 and the <i>Preliminary Noise Analysis Technical Report</i> for more information.
Air Quality				
Air Quality Criteria	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Review of US Environmental Protection Agency (EPA) rulemaking and regulations, EPA website	No.	--Since the completion of the 2000 Re-evaluation and 2003 SEIS, the EPA has revised several of the National Ambient Air Quality Standards (NAAQS): ozone (2008), fine particulate matter (2006), nitrogen dioxide (2010), and lead (2008). The project is located in a region that has not been designated nonattainment for any of these new standards.
Existing Conditions	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Review of previous NEPA documentation; Virginia Ambient Air Monitoring Data Reports, Virginia Department of Environmental Quality (VDEQ website). Updated air quality impact analyses.	No.	--While forecasted traffic volumes have increased due to extension of the design year farther into the future, the increases are not substantial enough to meaningfully change the air analysis results from the FEIS. The updated air quality analysis indicates that the project would result in no violations of the NAAQS. See Section 3.4 and the <i>Air Quality Technical Report</i> .
Regional Compliance with the particulate matter (PM) Standards	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Review of VDEQ website for current attainment status.	No.	The project is located in an attainment area for PM _{2.5} NAAQS. The VDEQ maintains a PM _{2.5} and ozone monitoring station in the project area on the campus of Albemarle County High School.
Regional Compliance with the Ozone Standards	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Review of VDEQ website for current attainment status.	No.	The project is located in an attainment area for ozone. The VDEQ maintains a PM _{2.5} and ozone monitoring station in the project area on the campus of Albemarle County High School.

Table 5. Summary of Environmental Issues

Issue / Resource	New Information?	Method of Review	Have the Impacts Changed?	Comment
Air Toxic Analysis	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Review of VDEQ, EPA, and FHWA websites for current guidance. Literature review of potential health effects of vehicular emissions.	No.	<p>In accordance with FHWA guidance, the project has a low potential for mobile source air toxics (MSAT) effects. On a regional basis, EPA’s vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region-wide mobile source air toxics to be significantly lower than they are today.</p> <p>Several comments were received during the development of the EA regarding the health effects of mobile source emissions. As stated above, the region has not been designated nonattainment for any of the NAAQS developed by EPA, including the pollutants most associated with mobile sources: carbon monoxide, ozone, and particulate matter. The NAAQS for these pollutants were developed by EPA taking into account the most recent accepted science and are periodically revisited and revised by them. The NAAQSs consist of a primary standard and a secondary standard. The primary standard is developed to provide public health protection, including protecting the health of “sensitive” populations such as asthmatics, children, and the elderly. The secondary standard is developed to provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings. Health effects are expanded upon in Section 3.4.</p>
Ecosystems				
Native Wildlife	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Review of previous NEPA documentation, US Fish and Wildlife Service (USFWS) online data, Virginia Department of Game and Inland Fisheries (VDGIF)	No.	

Table 5. Summary of Environmental Issues

Issue / Resource	New Information?	Method of Review	Have the Impacts Changed?	Comment
		online data, VDCR online data, and current design. Field review.		
Existing Vegetation	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Review of previous NEPA documentation and current design. Field review.	No.	In accordance with Executive Order 13112, Invasive Species, the potential for the establishment of invasive terrestrial or aquatic animal or plant species during construction of the project would be minimized by following provisions in VDOT's Road and Bridge Specifications, which addresses the purpose and intent of the EO.
Threatened & Endangered Species Critical Habitat Wildlife and Waterfowl Refuges	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Review of previous NEPA documentation, USFWS online data, VDGIF online data, VDCR online data, new mussel survey data, and current design.	No.	--One federally listed (James spiny mussel) and one state listed (green floater) threatened or endangered species are reported to occur or potentially occur within the study area vicinity. No new information was identified that would change the "no jeopardy" conclusion from previous Section 7 consultation and project coordination. The new surveys did not find any green floaters. See Section 3.5 for additional information. --There is no critical habitat associated with the James spiny mussel. --There are no wildlife or waterfowl refuges in the project area.
Water Resources				
Surface Waters	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Review of previous NEPA documentation, VDEQ data, County documents, and current design.	No.	The alignment crosses one water body and is drained by two additional water bodies that have been assessed in compliance with Sections 303(d), 305(b), and 314 of the federal Clean Water Act and the Safe Drinking Water Act. Two of the water bodies have been found to be impaired. See Section 3.6 for additional information.
Public Water Supply	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Review of previous NEPA documentation, current design, and County and RWSA documents.	No.	--The Rivanna Water and Sewer Authority developed a <i>Regional Water Supply Plan</i> for Albemarle County, the City of Charlottesville, and the Town of Scottsville. The <i>Plan</i> was prepared to comply with the State Water Control Board's Local and Regional Water Supply Planning Regulation and provides information about

Table 5. Summary of Environmental Issues

Issue / Resource	New Information?	Method of Review	Have the Impacts Changed?	Comment
				water sources and supply systems for the localities involved. --The Authority also has begun construction on the Ragged Mountain Reservoir expansion and pipeline to address growing water needs in Albemarle County and the City of Charlottesville. A nine-mile-long 36” pipeline will be constructed between the Ragged Mountain Reservoir and the South Fork Rivanna Reservoir to allow transfers of water between the two reservoirs. Portions of the pipeline route may overlap portions of the Route 29 Bypass Route and coordination between the two project designs may be necessary. --The Authority also issued a request for proposals to dredge the South Fork Rivanna Reservoir to remove accumulated sediments and is in negotiations with the successful bidder. --See Section 3.6 for additional information.
Aquatic Resources				
Fish	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Review of previous NEPA documentation, current design, and online data sources.	No.	
Submerged Aquatic Vegetation	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Review of previous NEPA documentation, current design, and online data sources.	Not applicable.	
Benthos	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Review of previous NEPA documentation, current design, and VDEQ Draft Water Quality Assessment.	No.	
Other Flora and Fauna	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Review of previous NEPA documentation and current design; field review.	No.	

Table 5. Summary of Environmental Issues

Issue / Resource	New Information?	Method of Review	Have the Impacts Changed?	Comment
Floodplains				
Floodplains	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Review of previous NEPA documentation, current design, and Flood Insurance Rate Maps effective 2/4/05 published by Federal Emergency Management Agency.	No.	Based on current Flood Insurance Rate Maps (effective 2/4/05), the estimate of encroachment of the Bypass into floodplains remains the same at approximately 0.11 linear miles of 100-year floodplain crossing at the South Fork Rivanna River. The crossing would be perpendicular to the River and would be on bridge structure. See Section 3.6 for more information.
Wetlands				
Wetlands	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Review of previous NEPA documentation, National Wetland Inventory, current design, and GIS data.	No.	The estimate of wetland impacts has remained the same at approximately 2.8 acres. See Section 3.6 for more information.
Chesapeake Bay Watershed				
Chesapeake Bay Water Quality	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Review information and sources provided in agency input; review online data sources.	Yes.	EPA issued the Final Chesapeake Bay TMDL (Total Maximum Daily Load) on December 29, 2010. In addition, to focus attention and resources on the Bay, on May 12, 2009, President Obama signed Executive Order (EO) 13508 on Chesapeake Bay Protection and Restoration to bring a new level of interagency coordination and cooperation and requiring that the Chesapeake EO Action Plan be updated annually. See Section 3.6.2 for more information.
Hazardous Waste Sites				
Hazardous Waste Sites and Transport of Hazardous Materials	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Review of previous NEPA documentation, current design, and online data sources.	No.	No new hazardous material sites have been identified within the project corridor. Discussion of potential spills of nuclear materials has been updated in Section 3.7 .
Public Parklands				
Public Parklands	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Review of DEIS, FEIS, 2000 Re-evaluation, Section 4(f) Evaluation, SEIS, engineering plans	No.	No new public park impacts are anticipated when compared to those identified in the 2000 Section 4(f) Evaluation.

Table 5. Summary of Environmental Issues

Issue / Resource	New Information?	Method of Review	Have the Impacts Changed?	Comment
		and design refinements, Places29 Master Plan, Albemarle County and City of Charlottesville parks and future parks information.		
Historic Properties				
Architectural Resources	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Review of previous NEPA and Section 106 documentation; supplemental architectural survey.	No.	A survey was conducted to ensure that any buildings within the area of potential effects (APE) recently achieving 50 years of age (and not surveyed previously) were considered for National Register of Historic Places eligibility. None of the 12 buildings surveyed are considered eligible for the National Register, and VDOT has made this eligibility recommendation to VDHR. See Management Summary for Architectural Survey.
Terrestrial Archaeological Resources	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Review of previous NEPA and Section 106 documentation.	No.	As detailed in the SEIS, all areas within the archaeological APE have been subjected to archaeological surveys, which resulted in identification of two prehistoric archaeological sites (44AB428 and 44AB430) within the northern interchange area, determined eligible for the National Register of Historic Places (NRHP). Because these sites are important chiefly for the information they may contain, and because data recovery operations will be conducted in accordance with a plan approved by the Virginia Department of Historic Resources (VDHR) prior to any land-disturbing activity related to bypass construction, the project will have no adverse effects on these sites. Both VDHR and the federal Advisory Council on Historic Preservation have concurred with this determination.
Underwater Cultural Resources	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A			No underwater cultural resources have been identified throughout the course of the NEPA process.
Indirect and Cumulative				
Socioeconomic Impacts	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Review of previous	Yes.	See Section 3.8 for discussion.

Table 5. Summary of Environmental Issues

Issue / Resource	New Information?	Method of Review	Have the Impacts Changed?	Comment
Natural Resource Impacts	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	NEPA documentation, current design, other projects in the vicinity, and local/ regional planning documents.	Yes.	See Section 3.8 for discussion.
Construction Impacts				
Air Quality	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Review of DEIS, FEIS, SEIS, and engineering plans and design refinements.	No.	Construction related impacts are addressed through VDOT's Road and Bridge Specifications which all contractors are required to comply with. These specifications also reference other requirements that are binding on the contractor such as erosion and sediment controls.
Noise	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		No.	
Water Quality	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		No.	
Maintenance & Control of Traffic	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		No.	
Health & Safety	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		No.	
Pollution Control	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		No.	
Section 4(f) Resources				
Section 4(f) Criteria	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Review of FHWA's Section 4(f) regulations and Policy Paper	No.	FHWA revised its Section 4(f) regulations, which are now found at 23 CFR 774. FHWA also updated and reissued its Section 4(f) Policy Paper in July 2012.
Section 4(f) Resources	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Review of previous NEPA and Section 4(f) documentation and current design.	No.	No resources protected under Section 4(f) (e.g., public parks, historic sites, recreational areas, wildlife refuges, etc.) will be impacted by the project that have not already been accounted for and addressed.
Permits				
Section 404 Permits	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Review of previous NEPA documents, applicable regulations, and current design.	No.	All applicable permits would be acquired prior to construction.
Section 10 Permits	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		No.	
Virginia Water Protection Permit	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		No.	
Subaqueous Bed Permit	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		No.	
Coast Guard Permit	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		Not applicable.	

Table 6. Summary of Minimization/Mitigation Measures Related to the Bypass Project

Issue / Resource	Commitment	Location of Commitment Statement	Any Changes?	Comment
Relocations	All remaining relocations and real property acquisition would be in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended.	All previous NEPA documentation	No.	
Albemarle County School Complex	The cross section of the bypass at this location has been reduced by eliminating the median, crossing the portion of the property near Tributary K on a bridge instead of a fill, and by suppressing the roadway to minimize visual and noise impacts. In addition, the alignment has been shifted to the degree possible to avoid any direct use of the trail behind Jack Jouett Middle School, and the trail behind Mary Greer Elementary School will be reconnected outside of the highway right-of-way. Finally, a fence will be installed along the right-of-way to prevent pedestrian access and disturbed slopes will be revegetated.	ROD	No.	
Historic Properties	A Section 106 Memorandum of Agreement was executed in 1992, which documents how the adverse effect to Schlessinger Farm will be taken into account. A data recovery plan for archaeological sites 44AB428 and 44AB430) within the northern interchange will be implemented.	1993 FEIS 2000 Reevaluation	No.	
Threatened & Endangered Species	To minimize impacts to the federally listed endangered James spiny mussel located in Ivy Creek, there will be time-of-year restrictions (May 15 – July 31) on construction in tributaries K, L, and M draining to Ivy Creek; erosion and sediment control measures will be implemented; tributary K will be crossed on by bridge instead of a fill.	Biological Assessment, 2000 Reevaluation, SEIS, ROD	No.	
South Fork Rivanna Reservoir	An extensive stormwater management plan has been developed to protect the South Fork Rivanna River Reservoir. The plan includes 17 stormwater retention ponds. Of these, the six retention ponds located in the reservoir watershed have been designed as wet ponds to achieve a higher pollutant removal efficiency. Concrete curb will be incorporated along fill sections within the reservoir watershed in order to capture 100 percent of the roadway runoff. The runoff will be collected through a series of curb, median, and ditch inlets and conveyed to the stormwater retention ponds through concrete pipe systems. A monitoring program will be established to measure pollutant concentrations at several outfall locations before, during, and after construction. Rock check dams will be used in all of the fill ditches of the proposed roadway within the reservoir's watershed. Turbidity curtains will be used at three locations along the reservoir during construction.	SEIS	Yes.	

Table 6. Summary of Minimization/Mitigation Measures Related to the Bypass Project

Issue / Resource	Commitment	Location of Commitment Statement	Any Changes?	Comment
Wetlands	Where wetlands cannot be avoided, impacts will be minimized by measures such as bridging and best management practices that have been or will be incorporated into the design. In addition to these measures, compensation for unavoidable impacts will follow the US Army Corps of Engineer's Final Compensatory Mitigation Rule which standardizes mitigation nationally. This compensation follows a hierarchy of preferred mitigation approaches that include: 1) mitigation banks; 2) in-lieu fees; and 3) permittee-responsible mitigation. Compensation for impacts would be provided as part of the permit conditions for any authorizations issued by the USACOE and VDEQ. Because these agencies determine the compensation requirements for stream impacts on a case-by-case basis, the quantitative requirements for the project would be negotiated with them as part of the permit application process. Compensation may involve enhancement or restoration to stream and riparian areas, use of credits from an approved stream mitigation bank, or payments to the Virginia Wetlands Restoration Trust Fund.	FEIS	No.	
Water Quality	In addition to the measures identified for the South Fork Rivanna River Reservoir, the vegetated side slopes and ditches to be established along the project will minimize any potential water quality degradation attributable to normal highway runoff.	FEIS	No.	
Hazardous Waste Sites	Any hazardous materials discovered during construction of the project or during demolition of existing structures will be removed and disposed of in compliance with all applicable federal, state, and local regulations. All necessary remediation would be conducted in compliance with applicable federal, state, and local environmental laws and would be coordinated with the EPA, the VDEQ, and other federal or state agencies as necessary.	All previous NEPA documentation	No.	

3.2 LAND USE

Since completion of the SEIS, new development has occurred in the City of Charlottesville and Albemarle County. Some of this is along the three-mile section of Route 29 between Route 250 Bypass and the South Fork Rivanna River identified in the purpose and need for the project. For example, Stonefield, a 1.2-million-square-foot mixed-use commercial/residential project is under construction on 65 acres at the northwestern corner of the intersection of Route 29 and Hydraulic Road. The development can have a maximum of 650 dwelling units. At the southern terminus of the proposed bypass, Leonard Sandridge Road was opened to traffic in 2006. This road provided access into the North Grounds of UVA and had been part of the Route 29 Bypass project. Construction is underway on the North Grounds for a new 230-unit apartment complex with a clubhouse, fitness center, and other amenities. In Albemarle County's designated growth areas along Route 29 to the north of the Route 29 Bypass project, additional residential and commercial development has occurred. In the same area, development continues at the University of Virginia Research Park, a 562-acre planned development/industrial park. Finally, additional development has occurred within the South Fork Rivanna Reservoir watershed.

The new development along Route 29 and at the North Grounds is relevant to travel demand along the existing Route 29 corridor and on the proposed bypass. Accordingly, it has been taken into account in the updated traffic forecast to the extent that associated population and employment assumptions are incorporated into the MPO's regional travel demand model. Resulting increases in traffic that additional development will bring, likewise, have been taken into account in the assessment of air and noise impacts. Additionally, the continuing development and traffic generated by such development have been factors in changes to projects and additions to the MPO's CLRP. New development within the Reservoir watershed is relevant to cumulative impacts considerations and is addressed further in the cumulative impacts section of this EA.

3.3 NOISE

For the purposes of the noise analysis, the project study area was divided into 17 areas of common noise environment (CNE). CNEs are groupings of receptor sites that, by location, form distinct communities within the project area and contain receptors with similar exposures to noise. These areas are used to evaluate traffic noise impacts and potential noise abatement options for communities as a whole and to assess the feasibility and reasonableness of possible noise abatement measures for those areas. The CNEs contain 77 receptor locations, which are comprised of 18 monitoring sites and 59 "modeling-only" sites. The monitoring sites are used to establish existing conditions and to verify that the noise model can be used to predict future noise levels. The modeling sites are the sites where future noise levels have been forecasted.

If noise levels are predicted to "approach" or "exceed" the absolute FHWA/VDOT Noise Abatement Criteria (NAC) for the design year build scenario at any receptor, then an impact is said to occur and a noise abatement evaluation is warranted. The absolute NAC for most land uses (Category B) along the corridor is 67 dBA. The NAC were developed by considering several criteria including: 1) hearing impairment; 2) annoyance, sleep, and task interference or disturbance; and 3) interference with speech communication. VDOT defines "approach" as being within 1 dBA of 67 dBA; therefore, a noise impact occurs when noise levels exceed 66 dBA. Furthermore, VDOT noise policy also considers noise abatement for land uses that are predicted to experience at least a 10 dBA increase when comparing existing noise levels to design year build noise levels. The noise analysis prepared for this project indicates that design

year build noise levels are predicted to exceed the NAC at 30 receptor sites, which represent approximately 56 residential land uses and athletic fields associated with the Jack Jouett Middle School and Agnor-Hurt Elementary School. The updated noise analysis¹⁰ indicates slightly lower noise levels at the Jack Jouett Middle School, Mary Carr Greer Elementary School, and associated playgrounds and athletic fields for Build Year 2040 than previous analysis¹¹ indicated for Build Year 2022.

The Colonnades senior living facility is located over 1,000 feet from the project at its closest point. Per FHWA noise policy and guidance, highway traffic noise is not usually a serious problem for people who live more than 500 feet from heavily traveled freeways or more than 100 to 200 feet from lightly traveled roads. In addition to the distance between the bypass and the Colonnades property, the road would be approximately 10 feet below the elevation of the Colonnades at its closest point and up to 40 feet below the elevation of the Colonnades at its furthest point. Finally, the area between the bypass and the Colonnades would remain wooded which would have a dampening effect on any noise from the road, not to mention the fact that the bypass would be located on the other side of Stillhouse Mountain in this area, which would serve as a physical barrier between the bypass and The Colonnades facility. Stillhouse Mountain rises to over 750 feet in elevation while the elevation of the Colonnades property is around 600 feet in elevation.

All of the schools in the project area, which includes the University of Virginia, St. Anne's Belfield, Jack Jouett Middle School, Ivy Creek School (formerly Piedmont Regional Education Program, or PREP, School), Mary Greer Elementary School, Albemarle High School, and Agnor-Hurt Elementary School will not experience noise impacts at the school buildings, either internally or externally, because of their distance from the bypass, the topography, and the wooded areas separating the bypass from many of the school facilities.

Preliminary noise abatement measures (e.g., noise barriers) were found to achieve feasible reductions at the majority of the impacted CNEs; however, none of the evaluated barriers were found to satisfy VDOT's reasonableness criteria. Therefore, no barriers were recommended for further consideration as part of this analysis. The conclusions derived from the noise analysis are preliminary because all modeling was based on conceptual design and topographic information. Additional, detailed analyses are to be conducted during the final design phase of the project, and firm determinations on noise abatement will be made at that time.

3.4 AIR

The Charlottesville region is in attainment of all national ambient air quality standards (NAAQS) established by EPA. Accordingly, the Clean Air Act conformity requirements do not apply.

To demonstrate the potential effect of the project on air quality, a quantitative assessment of carbon monoxide (CO) concentrations was performed using computerized emissions and dispersion models. The assessment covered not only the bypass but existing Route 29 as well. CO emission rates were calculated for both Albemarle County and the City of Charlottesville for each analysis year. Through the emission modeling effort, it was determined that the air study would apply the emission rates generated for the City of Charlottesville throughout the project

¹⁰ Preliminary Noise Analysis Draft Report, Route 29 Bypass Project, McCormick Taylor, July 2012. Table 9, 2040 Noise Levels for CNE H: range from 51 to 63 (maximum).

¹¹ Final Design Noise Report, Route US 29 Bypass, Parsons Brinckerhoff Quade & Douglas, Inc, February 1997. Table 4A, Traffic Noise Exposures, Year 2022 Project Build Noise Level at Site #65: 64.

since those rates were higher than the rates generated for Albemarle County, thereby ensuring worst-case CO concentrations were projected for the project. Based on the results of the air quality analysis, CO concentrations with the Build Alternative are predicted to be well below the NAAQS in both the Opening Year (2015) and Design Year (2040). Additionally, the air study also concludes that locations along the existing Route 29 corridor will also experience reductions in CO concentrations from No-Build to Build conditions for both the opening and design years. Therefore, since projected CO levels are below the NAAQS under Build conditions, no exceedences are anticipated as a result of the proposed project and no mitigation measures have been considered.

Albemarle County and the City of Charlottesville have been designated as attainment for ozone and PM_{2.5}. Therefore, in accordance with EPA requirements, an analysis is not required as part of the air quality assessment at either the project or regional level.

In accordance with FHWA's September 30, 2009, *Interim Guidance Update on Mobile Source Air Toxic (MSAT) Analysis in NEPA Documents*, which was developed in consultation with EPA, FHWA has determined that the project has a low potential for MSAT effects because the forecasted AADT for the project is well below the thresholds (i.e., 140,000 to 150,000 ADT) where the potential for MSAT effects increase or MSAT effects from a project become a concern. That interim guidance focuses on the toxics acrolein, benzene, 1,3-butadiene, diesel particulate matter, formaldehyde, naphthalene, and polycyclic organic matter because these toxics pose the greatest risk for health effects. Because of the low potential for MSAT effects, a qualitative assessment of emissions has been conducted per the guidance and is included as part of the air quality analysis. Under the Build Alternative, there may be localized areas where VMT could increase and other areas where VMT could decrease. Therefore, it is possible that localized increases in MSAT emissions may occur in some locations. The localized increases in MSAT emissions may be most pronounced along the proposed bypass. However, even if localized increases do occur in some areas, total MSAT emissions are virtually certain to be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce annual MSAT emissions by 72 percent from 1999 to 2050.

The temporary air quality impacts from construction are not expected to be significant. Construction activities are to be performed in accordance with VDOT's current *Road and Bridge Specifications*.

Greenhouse gas emissions (as they relate to global climate change) were not addressed as part of the air quality analysis. Climate change is inherently a global issue that is more appropriately addressed at the state or national level by assessing the impact of transportation systems as opposed to individual projects. Further, climate change does not readily lend itself to an analysis at the local level, and national standards have not been established. Relative to the scope of global climate change, any change in greenhouse gas levels as a result of the project are likely to be insignificant. For example, the difference in regional VMT in comparing the 2040 build and no-build scenarios is expected to be 0.3%. However, similar to MSATs, despite increases in VMT, greenhouse gas emissions from vehicles are expected to decrease over time as new vehicle standards, cleaner vehicles, and federal programs are implemented. Accordingly, the magnitude of the changes in climate caused by the project and any corresponding impacts on environmental resources would be too small to measure since current analytical tools are not sophisticated enough to accurately reflect minute differences. Attributing any environmental consequences to the differences in emissions or assessing how they contribute to impacts occurring around the world is not possible in any meaningful way either. As a result, we cannot have confidence that

an assessment of greenhouse gas emissions from the project would yield information that would be helpful to the public or relevant to project decision making.

Finally, over the course of the past year, VDOT and FHWA have received several unsolicited comments referencing recent studies on health effects from automobile and truck emissions. Most of the comments have been general in nature and have not provided any information on specific studies. A few comments have expressed general concern about health effects on school children and the elderly. A few of the comments have cited a 2007 study by Gauderman on impaired lung development and a more recent 2010 study by McConnell on increased cases of asthma.

As already documented elsewhere in the EA and summarized here, the EPA is the lead agency responsible for carrying out the provisions and programs of the Clean Air Act to reduce air pollution nationwide, and they have the authority to implement and enforce regulations for reducing air pollutant emissions. In this capacity, EPA sets limits or standards on certain pollutants, known as criteria pollutants, considered harmful to public health and the environment. These standards, known as the National Ambient Air Quality Standards (NAAQS), have been developed for carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter, and sulphur dioxide; the NAAQS for these criteria pollutants were developed by EPA taking into account the most recent accepted or peer reviewed science and are periodically revisited and revised by them as the science advances. The NAAQSs consist of a primary standard and a secondary standard. The primary standard is developed to provide public health protection, including protecting the health of “sensitive” populations such as asthmatics, children, and the elderly. The secondary standard is developed to provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings. Of the pollutants regulated by EPA, carbon monoxide, ozone, and particulate matter are most associated with mobile sources. The region where the project is located has not been designated nonattainment for any of the NAAQS developed by EPA, including carbon monoxide, ozone, or particulate matter. The attainment designation for ozone and particulate matter are based on monitoring data. The Virginia VDEQ maintains a monitoring station for ozone and particulate matter (i.e. PM_{2.5}) at Albemarle High School which is part of the Albemarle County School Complex. The monitoring station is in the vicinity of the County’s school bus parking lot and its fueling facility which themselves are sources of particulate matter and ozone precursors, respectively.

A quantitative carbon monoxide hot-spot analysis was conducted that showed that carbon monoxide levels in the project corridor would be comparable under the design year build and no build scenarios. In addition, those levels would be well below the carbon monoxide NAAQS in the design year. The analysis also looked at the two worst-case intersections on existing Route 29. With the project in place, carbon monoxide levels at all modeled receptor sites associated with those intersections will be lower in the design year compared to the no build scenario. Again, all levels will be well below the carbon monoxide NAAQS. Even though the region is attainment for PM_{2.5}, the project was still evaluated to determine whether it was a project of air quality concern. In accordance with FHWA and EPA’s guidance for conducting qualitative hot-spot analyses in PM_{2.5} and PM₁₀ nonattainment areas and 40 CFR 93.123, it has been determined that the project is not a project of air quality concern when it comes to PM_{2.5}. With respect to ozone, ozone is a regional pollutant that is associated with the summer months when temperatures are higher. The pollutant ozone is not emitted directly into the air but is created by chemical reactions between oxides of nitrogen and volatile organic compounds in the presence of sunlight over time. Ozone does not necessarily form where the nitrogen oxides and volatile organic compounds are emitted but, subject to meteorological conditions, may form elsewhere in

the region away from its sources and later in the day after a region has heated up. Accordingly, it is not possible to draw informed conclusions about ozone impacts from individual projects. This is why regions that are classified nonattainment for ozone conduct analyses of their entire regional roadway network to determine whether they will have any ozone violations. In this regard, it has been determined that there will only be a 0.3% increase in VMT on the roadway network with the project in place when compared to the no build network. The project is forecasted to carry approximately 28,000 vehicles per day with 3% of those vehicles being trucks. The majority of traffic that would use the bypass will be shifted from the existing road network as opposed to new or induced traffic. Given this, the contribution of the project to overall ozone levels in the region is minor. Existing facilities like Route 29, which has numerous signalized intersections and is forecasted to carry upwards of 86,000 vehicles per day in the design year under the no build scenario, contributes more substantially to regional ozone levels. With the bypass in place, existing Route 29 would carry over 68,000 vehicles between the bypass termini. Based on the forgoing, the project itself is not expected to cause any violations of the NAAQS's primary standards established to protect human health.

There are hundreds and hundreds of peer-reviewed studies (exposure, epidemiology and toxicology studies) that have been conducted on the subject of traffic-related air pollution (which include both criteria pollutants and MSATs) in terms of emissions, exposure, and health effects. Not all of these studies are conclusive nor do they arrive at the same conclusions. Therefore, given the universe of studies, considering just one or two studies does not allow one to draw informed conclusions. The Health Effects Institute (HEI), a nonprofit corporation chartered in 1980 as an independent research organization to provide high-quality, impartial and relevant science on the effects of air pollution on health, has done a lot of work in this area. In 2010, HEI released Special Report #17 titled, *Traffic-Related Air Pollution: A Critical Review of the Literature on Emissions, Exposure, and Health Effects*¹². The panel that developed the report consisted of scientists from a variety of disciplines including medicine, environmental science, environmental health, and vehicle emissions. In compiling its report, HEI considered hundreds of peer-reviewed studies related to emissions and exposure, epidemiology, and toxicology published between January 1980 and October 2008 (including the Gauderman study as well as an earlier McConnell study). Based on their efforts, HEI affirmed that motor vehicles are a significant source of air pollution in urban areas and concluded that there was sufficient evidence to support a causal association between traffic related air pollution and exacerbation of asthma in children that already have it. Based on their review of the available research, HEI also concluded that the results were either inadequate, only suggestive, or there was insufficient evidence/data to infer a causal association between traffic related pollution and adverse human health effects. Specifically, HEI concluded:

Asthma Incidence and Prevalence in Children (epidemiology studies)

- “Living close to busy roads appears to be an independent risk factor for the onset of childhood asthma.” They considered the evidence for a causal relationship to be in the gray zone between “sufficient” and “suggestive but not sufficient.”

Exacerbation of Symptoms in Children with and without Asthma (epidemiology studies)

- The “evidence is “sufficient” to infer a causal association between traffic exposure and exacerbations of asthma but that it is “inadequate and insufficient” to infer a causal association between exposure and respiratory symptoms in children without asthma.”

¹² <http://pubs.healtheffects.org/getfile.php?u=553>

Asthma Onset and Respiratory Symptoms in Adults

- HEI noted that the evidence between exposure to traffic-related pollution and new adult asthma was “inadequate and insufficient” as it was only investigated in one study. Seventeen studies were reviewed by HEI on respiratory systems, “of which all but one relied on proximity to roads or traffic-density measures, and concluded that the evidence for a causal association is “suggestive but not sufficient”.
- The “few human [toxicology] studies in which subjects were exposed to realistic traffic conditions are supportive of the possibility that persons with asthma may be more susceptible to adverse health effects related to such exposure.” When the epidemiologic and toxicologic data were viewed together, HEI “noted that a case could be made that there are likely to be causal associations related to exposure to traffic-related air pollution and asthma exacerbation and some other respiratory symptoms. However, given the lack of a large body of toxicological data based on human and animal exposures to real world traffic scenarios, [HEI] noted that it was hazardous to conclude that causality has been established at this time for all respiratory symptoms at all ages.”

Lung Function in Children and Adults (epidemiology)

- HEI “concluded that the evidence is “suggestive but not sufficient” to infer a causal association between short- and long-term exposure to traffic-related pollution and decrements in lung function.”
- “While the epidemiology studies do provide suggestive evidence of chronic exposure effects on lung function in adolescents and young adults, there are too few toxicologic data to indicate what mechanisms underlie these observations. The aggregate epidemiologic and toxicologic evidence to chronic exposure to traffic-related air pollution and altered lung function in older adults...is too sparse to permit any inference with respect to causal association.”

These findings by HEI are consistent with EPA’s approach to MSATs. Because the relationship between MSATs and health effects is an area of continuing research and many questions remain unanswered, EPA has not established a NAAQS for any of the MSATs to protect human health other than particulate matter. Further, the tools and techniques for assessing project-specific health outcomes are limited. These limitations impede the ability to evaluate how the potential health risks posed by MSAT exposure should factor into project level decision making. Regardless, as acknowledged by EPA in their 2007 Final Rule on the Control of Hazardous Air Pollutants from Mobile Sources, EPA has instituted controls that will dramatically reduce MSAT emissions through cleaner fuels and cleaner engines over time. Based on EPA’s MOBILE6.2 model, even if VMT increases 145% between 1999 and 2050 consistent with historical trends, there will be a combined reduction of 72% in the total annual emission rates for the MSATs most closely tied to mobile sources. Accordingly, it is reasonable to conclude that even if the association between adverse health effects and MSATs is more clearly established over time, the potential health impacts from the project associated with mobile source emissions is expected to decrease as those emission rates decrease. Likewise, the qualitative MSAT analysis prepared for this project and included in the *Air Quality Technical Report* determined that the project has a low potential for MSAT effects. Not only is this based on the trend in emission rates described above, it is also based on the fact that the project is not forecasted to carry anywhere near the traffic at which the potential for MSAT effects is considered to be higher (e.g. 140,000 to 150,000 ADT).

3.5 THREATENED AND ENDANGERED SPECIES

The 2000 Re-evaluation concluded that no impacts to aquatic endangered or threatened species would occur within the project area because no federally listed endangered or threatened species are present in any streams that would be crossed by the proposed Bypass. Three separate surveys of Ivy Creek were conducted at that time, one of which included all tributaries that would be crossed by the Bypass, and evidence of the federally listed endangered James spiny mussel (*Pleurobema collina*) was found downstream from a portion of the project. During formal Section 7 consultation with USFWS, however, FHWA recommended that the project would not have a significant adverse impact on the mussel resources and would not pose a threat of extinction to the James spiny mussel. Various reasons were cited, including the fact that the 14 surveyed tributaries in the Ivy Creek drainage area that would be crossed by the project had no mussels and were unsuitable for mussels because of small size and insufficient flow; the proposed project involves no work in Ivy Creek and the nearest site of roadwork on the project would be more than 1,000 feet from Ivy Creek; and extensive stormwater management provisions and erosion and sediment control measures would be incorporated into the project design to reduce impacts from highway runoff and construction.

In response, USFWS issued its Biological Opinion that the proposed Bypass was “not likely to jeopardize the continued existence of the James spiny mussel and is not likely to destroy or adversely modify its critical habitat because no critical habitat exists for this species.” In the 2000 Re-evaluation, 2003 SEIS, and 2003 ROD it was also noted that VDOT will impose several protective conditions during Bypass construction, including time-of-year restrictions on construction and specific erosion and sedimentation control measures.

Subsequent to the 2003 SEIS, the *South Fork Rivanna Reservoir Dredging Feasibility Study Pre-Dredge Survey Report* prepared for the Rivanna Water and Sewer Authority in February 2010 reported findings of research and surveys for known threatened and endangered species in the vicinity of the South Fork Rivanna Reservoir. The report stated that the James spiny mussel species is believed to be declining due to habitat degradation caused by siltation, impoundment, pollution, and reproduction isolation of subpopulations in the upper James River drainages. In addition, the report cited that observations and collections of the James spiny mussel have been documented in upstream reaches of both the South Fork Rivanna River and the Ivy Creek tributary, with the last recorded collection on October 4, 1997 in an upstream reach of the Ivy Creek tributary. Based on that 1997 observation, the USFWS listed Ivy Creek and a select reach of the South Fork Rivanna River (that portion of the River upstream of the bend where Beau Mont Farm Road approaches from the southwest, located northwest of the project location and reservoir) as potential habitat for the endangered James spiny mussel. This information was taken into account during the Section 7 consultation conducted for the 2000 re-evaluation.

The report also cited a 2004 survey¹³ for freshwater mussels that extended up Ivy Creek and other Reservoir tributaries, well above the normal pool area that was being evaluated for dredging. The survey found one James spiny mussel in Buck Mountain Creek, approximately 296 meters above its confluence with the South Fork Rivanna River. No James spiny mussel were found in the areas being considered for dredging. The survey concluded that habitat in the lower reaches of Ivy Creek and the Reservoir was not suitable for the James spiny mussel

¹³ Rash, Jacob & Dr. Richard J. Neves. 2004. “A Survey for Freshwater Mussel Fauna within Tributaries of the South Fork Rivanna Reservoir”, Virginia Cooperative Fish and Wildlife Research Unit, Virginia Polytechnic Institute and State University, Blacksburg, VA. Prepared for Gannett Fleming, Inc., Fairfax, VA.

because this mussel species typically prefers rock and sand bottoms and the Reservoir in these areas has extensive deposition of sediments, including large percentages of silts and clays (as documented in the *South Fork Rivanna Reservoir Dredging Feasibility Study Sediment Characterization Report*). While dredging would adversely affect the James spiny mussel if it is present in the area being dredged, the report concluded that there is little probability of its occurrence in areas likely to be dredged in the main body of the Reservoir, including the mouth of Ivy Creek.

Most recently, two surveys for James spiny mussel were conducted as part of this EA:

- In December 2011, the *Survey for Freshwater Mussels in Ivy Creek in Proximity to the Proposed Route 29 Bypass Corridor* documented the findings of the survey of a 3,000 meter reach of Ivy Creek and a 1,500 meter reach of one of its larger perennial tributaries (referred to as Tributary K by Neves and Beaty, 1997). The 2011 survey confirmed the presence of James spiny mussel (2 live specimens) in Ivy Creek. The unnamed tributary to Ivy Creek (Tributary K), while large enough to support *P. collina*, was found to not support freshwater mussels.
- Completed in June 2012, the *Survey for Freshwater Mussels in the South Fork Rivanna River at the Proposed Route 29 Bypass Crossing* detailed the results of a survey extending from the South Fork Rivanna Reservoir dam to approximately 800 meters downstream of the proposed Route 29 bypass crossing, approximately a 1,000-meter reach of river. The report noted that the surveyed reach of the South Fork Rivanna River was unlike any other stream in the Rivanna River watershed that had been observed by the surveyors. It was unusually deep for its size and drainage basin and unusually turbid even when other streams in the watershed, including those feeding the South Fork Rivanna Reservoir were clear, likely caused by productivity and sedimentation from the Reservoir. While observations were made of 16 live specimens of Eastern elliptio (*Elliptio complanata*), 29 live specimens of Eastern floaters (*Pyganodon cataracta*), and 29 live specimens of 11 paper pondshells (*Utterbackia imbecillis*), no evidence was found of live or dead *P. collina*, green floater (*Lasmigona subviridis*), or snails. The Asian clam, *Corbicula fluminea*, was abundant and live specimens were relatively large. Given the detection probabilities documented in the report, it was concluded that it was highly improbable that the survey failed to detect protected species present at a limited density.

The findings of the recent surveys validate the previous finding that the proposed Bypass is not likely to jeopardize the continued existence of the James spiny mussel or destroy or adversely modify its critical habitat (since no critical habitat has been designated by USFWS). While some specimens have been observed in Ivy Creek, the proposed project involves no work in Ivy Creek and the nearest site of roadwork on the project would be more than 1,000 feet from Ivy Creek. In addition, runoff from the project will be handled by stormwater retention ponds before being discharged into the surrounding area, consisting mainly of open fields, forest, and some development, which would likely capture any runoff before reaching Ivy Creek. Nevertheless, VDOT continues to remain committed to imposing several protective conditions during bypass construction, including time-of-year restrictions on construction and implementation of erosion and sedimentation control measures.

3.6 WATER RESOURCES

The Virginia Department of Environmental Quality (VDEQ), the US Army Corps of Engineers (USCOE), and the EPA regulate water resources and water pollution in Virginia. Together, they administer programs created by the federal Water Pollution Control Act of 1972, commonly known as the Clean Water Act, the federal Water Quality Act of 1987, and a 1984 amendment to the federal Resource Conservation and Recovery Act. Section 404 of the Clean Water Act regulates discharges of dredged or fill material into waters of the United States (WOUS), including wetlands. The project area is located in the Rivanna River Watershed. The effects of the proposed project on the watershed are described in detail in the 2003 SEIS.

3.6.1 Water Quality

In compliance with reporting requirements of the Clean Water Act Section 303(d), VDEQ monitors streams for a variety of water quality parameters, including temperature, dissolved oxygen, pH, fecal coliform, *e. coli*, *enterococci*, total phosphorus, chlorophyll *a*, and benthic invertebrates, as well as metals and toxics in the water column, sediments, and fish tissues. The 303(d) list includes those water bodies and watersheds that exhibit levels of impairment requiring investigation and restoration. Not all parameters are monitored at each of the ambient water quality monitoring stations. Citizen groups and federal agencies also monitor some streams and provide their data to the VDEQ for compilation.

The South Fork Rivanna Reservoir is used by the Rivanna Water and Sewer Authority to supply drinking water to Charlottesville and Albemarle County. The reservoir has been assessed and supports wildlife, aquatic life, recreation, and use as a public water supply. Ivy Creek, which is not directly crossed but drains the watershed where a large portion of the alignment is located and contributes to the reservoir and the public water supply, supports wildlife, recreation, and use as a public water supply, but it is impaired¹⁴ for aquatic life (VDEQ, 2012).

Of the streams crossed by the alignment, only the Rivanna River has been assessed for water quality by VDEQ. The stretch crossed by the alignment supports wildlife and recreation, has not been assessed for fish consumption, and does not support aquatic life due to non-point source pollution from the urbanized watershed and the dam (VDEQ, 2012).

Albemarle County amended the Water Protection Ordinance in 2008 to expand the stream buffer requirements to all intermittent streams in the designated Rural Areas, providing the entire Rural Areas the same protection previously afforded only to specific water supply protection areas. The 2008 amendments also clarified the ability for development projects to impact buffers with stream crossings and set specific design criteria for those crossings, which will be accounted for in the design of the project. The alignment crosses 28.3 acres of these buffers (**Figure 5**).

During construction, non-point source pollutants could possibly enter groundwater or surface water from stormwater runoff. To minimize these impacts, appropriate erosion and sediment control practices will be implemented in accordance with local, state, and federal regulations. These specifications also prohibit contractors from discharging any contaminant that may affect water quality. In the event of accidental spills, the contractor is required to immediately notify all appropriate local, state, and federal agencies and to take immediate action to contain and remove the contaminant.

¹⁴ Per VDEQ, this segment is impaired due to violations of the Virginia Stream Condition Index for Benthic-Macroinvertebrate Bioassessments; however, the source of the impairment is unknown.

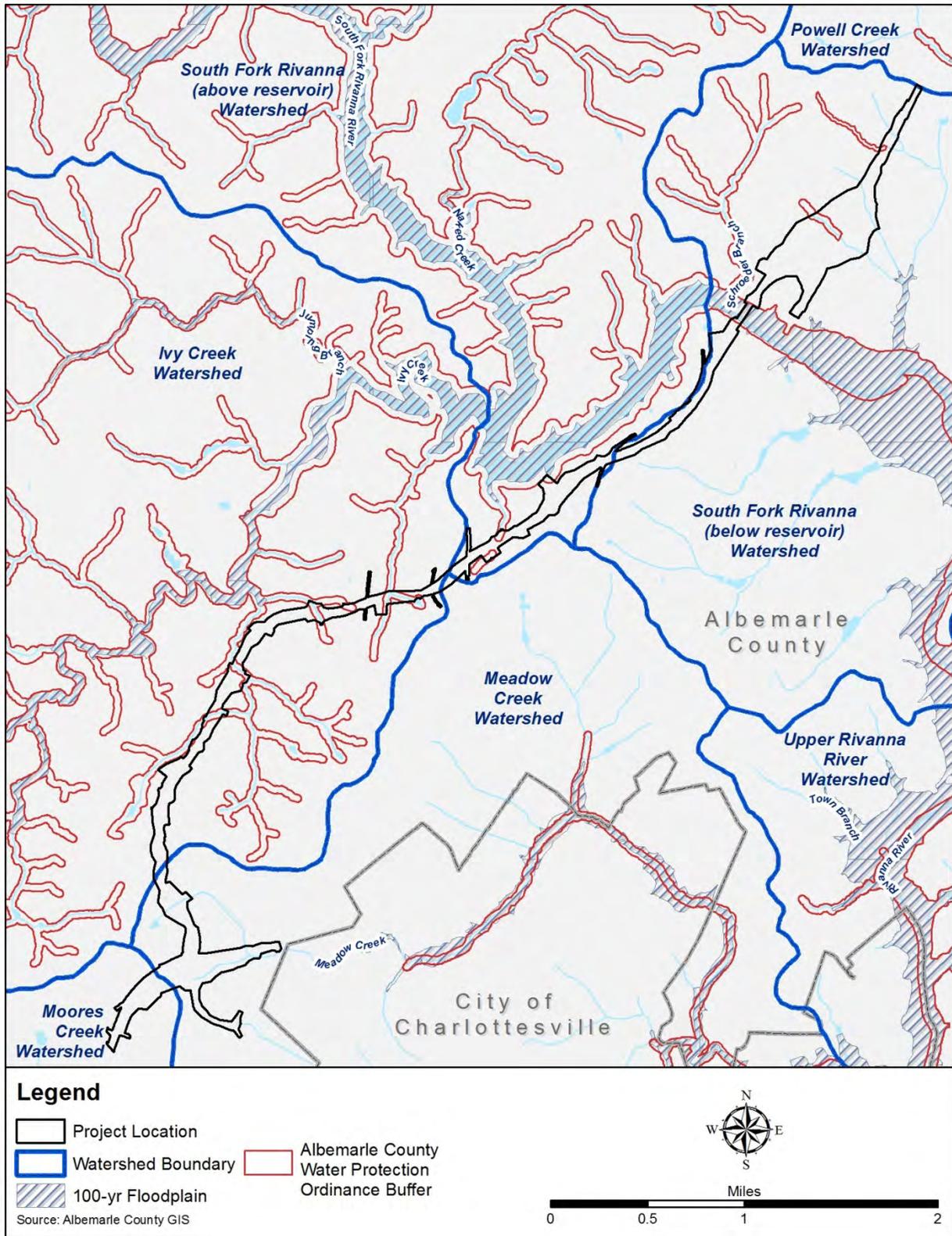


Figure 5. Water Protection Buffers and Floodplains

Minor long-term water quality effects could occur as a result of increases in impervious pavement surfaces. The proposed mitigation for stormwater management, as detailed in the 2003 ROD, will not only capture all runoff from the project within the watershed but also capture runoff from an additional ten acres of developed areas in the vicinity of Woodburn Road. Effective July 1, 2012, all proposed VDOT activities/projects (except routine maintenance activities) that disturb a total of one acre or more (2,500 square feet or greater in a designated Chesapeake Bay Preservation Area) will require coverage under the Virginia Stormwater Management Program (VSMP) Construction Permit and will require compliance with the applicable water quality requirements contained in the VSMP Regulations. The requirements and special conditions of any required permits for work in and around surface waters would be incorporated into construction contract documents. The contractor would be required to comply with those conditions.

3.6.2 Chesapeake Bay TMDL

The Rivanna River is a 42.1-mile-long tributary of the James River in central Virginia, and via the James River, it is part of the watershed of Chesapeake Bay. Excessive nutrients in the Chesapeake Bay and its tidal tributaries promote a number of undesirable water quality conditions, such as excessive algal growth, low dissolved oxygen, and reduced water clarity, which impacts the necessary conditions for healthy aquatic life. The excessive amounts of nutrients (nitrogen and phosphorous) and sediment washing into the Bay from its major tributaries result from agricultural operations, urban and suburban stormwater runoff, wastewater facilities, air pollution and other sources, including onsite septic systems.

Since a 1987 Chesapeake Bay Agreement, EPA, the District of Columbia, and the six states in the Chesapeake Bay watershed have implemented various programs to improve the health of the Chesapeake Bay so that it will meet the requirements of the Clean Water Act. However, despite continuing efforts since then, the Bay remains significantly impaired, and cleanup plans failed to meet a 2010 deadline for pollutant reductions stipulated in the 2000 Chesapeake Bay Agreement. In addition, the EPA reached settlement in a 2009 lawsuit filed by Bay advocacy groups claiming that the EPA failed to take adequate measures to protect and restore the Bay.

As part of the settlement and due to the failure of earlier, voluntary restoration programs, EPA was required to establish a Total Maximum Daily Load (TMDL) for the Bay. EPA issued the Final Chesapeake Bay TMDL on December 29, 2010. In addition, to focus attention and resources on the Bay, on May 12, 2009, President Obama signed Executive Order (EO) 13508 on Chesapeake Bay Protection and Restoration to bring a new level of interagency coordination and cooperation and requires that the Chesapeake EO Action Plan be updated annually.

The Bay TMDL establishes limits for the amount of nutrients and sediment allowed to flow into the Bay from Delaware, Maryland, New York, Pennsylvania, Virginia, West Virginia and the District of Columbia. It is the largest ever established by EPA, covering a 64,000-square-mile watershed, and it is a combination of 92 smaller TMDLs for individual Chesapeake Bay tidal segments. The TMDL is designed to ensure that all pollution control measures needed to fully restore the Bay and its tidal rivers are in place by 2025, with at least 60 percent of the actions completed by 2017. The Rivanna River Basin Commission (RRBC) participated on the Stakeholder Advisory Group to the Virginia Secretary of Natural Resources, VDCR, and VDEQ to help develop the Virginia portion of the Chesapeake Bay TMDL during 2010.

The TMDL will be made possible through the development and execution of Watershed Implementation Plans (WIPs) that include pollution limits for point sources (permitted sources

such as wastewater treatment plants and urban stormwater systems) and non-point sources (diffuse, non-permitted sources such as agricultural lands and suburban stormwater). In addition to total pollution limits, the TMDL is further divided by jurisdiction and major river basin based on state-of-the-art modeling tools (Chesapeake Bay Watershed Model), extensive monitoring data, peer-reviewed science, and close interaction with jurisdiction partners.

Virginia is preparing the Phase II plan and has requested information from local governments about current land use; current level of best management practices (BMPs) for agriculture, urban, and other sectors; planned implementation of BMPs by 2025; and strategies and resources needed to meet 2025 implementation goals. The RRBC has recommended that watershed science be the basis for developing Phase II WIPs. The Chesapeake Bay Program's Watershed Model, in conjunction with models of the Chesapeake airshed and estuary, can be used in the development of management plans to protect water quality and restore living resources in the Chesapeake Bay and to ensure water quality standards for dissolved oxygen, clarity/submerged aquatic vegetation (SAV), and chlorophyll are achieved and fully maintained as required by the Chesapeake TMDL under future conditions of land use and population growth.

Based on a review of the model documentation and input from staff at the Chesapeake Bay Program Office, the Watershed Model is not calibrated to a scale that could be used to assess water quality impacts at the project level. As such, the direct impacts of the Route 29 Bypass project on the TMDL cannot be quantified. However, as stated in Section 2, the bypass is expected to carry approximately 28,000 vpd, and much of this volume would *shift from* existing Route 29, which parallels the proposed bypass on the crossing of the Rivanna River and along its entire alignment. As such, any impacts associated with the usage of the bypass would most likely occur regardless of its existence. In addition, as interchanges other than at the Bypass termini are not a part of the current project, development in areas adjacent to the bypass that may further impact water quality will be dependent upon other factors and not access to the bypass. Notwithstanding, as described in the section above, the project includes mitigation for stormwater management, during and after construction, as described in the 2003 ROD, and it will be required to comply with the applicable water quality requirements contained in the VSMP Regulations.

3.6.3 Streams

As reported in the 2000 Re-evaluation and the SEIS, the project would involve crossings of 24 streams. Most of the streams are small, unnamed intermittent or perennial tributaries. The largest stream, the South Fork Rivanna River, would be crossed by bridge. Most of the others would be crossed by pipe or box culvert. The potential impacts of the Bypass on these streams have not changed from those discussed in the SEIS.

All practicable measures will be taken to avoid and minimize impacts to streams and other water bodies; however, due to the linear nature and size of this project, unavoidable impacts are anticipated. Minimization measures could include modifications to the final design such as: minor alignment shifts to avoid or minimize impacts, the use of bridges instead of culverts, the use of retaining walls, temporary and permanent stormwater management measures, and open bottom culverts to retain natural stream bottoms and avoid excess erosion. Unavoidable stream relocations will be performed using natural stream design, which means that the channel should mimic the dimension, pattern, and profile of a representative reference stream reach.

Compensation requirements for stream impacts will be determined as a part of the permitting process with the US Army Corps of Engineers (USCOE) and the VDEQ. Stream mitigation requirements vary by length, level of disturbance, and compensation type: restoration, creation,

enhancement, and preservation. A detailed assessment of each crossing will be made and impairment type and amount will be analyzed to calculate mitigation. Such compensation would account for the quality of the impacted stream and could include activities onsite or offsite, use of credits from an approved mitigation bank, or payments to the Virginia Wetlands Restoration Trust Fund.

3.6.4 Floodplains

The Federal Emergency Management Agency (FEMA) mapping of floodplains (effective February 4, 2005) indicates the presence of a designated 100-year floodplain along the South Fork Rivanna River. The estimate of encroachment into floodplains remains the same as reported in the 2000 Re-evaluation and the 2003 SEIS at approximately 0.11 linear miles of 100-year floodplain crossing at the South Fork Rivanna River. FEMA mapping also indicates a regulatory floodway at this location. The crossing would be perpendicular to the river and its floodplain and floodway and would be on bridge structure. Accordingly, the crossing of the South Fork Rivanna River would not increase flood levels and would not increase the probability of flooding or the potential for property loss and hazard to life during the service life of the bridge. Therefore, it would have no effect on flooding risks. Nor would the Bypass be expected to have substantial effects on natural and beneficial floodplain values. The Bypass would not encourage, induce, allow, serve, support, or otherwise facilitate incompatible base floodplain development. The floodplain encroachment would not be a “significant encroachment” (as defined in 23 CFR 650.105(q)) because:

- It would pose no significant potential for interruption or termination of a transportation facility that is needed for emergency vehicles or that provides a community's only evacuation route.
- It would not pose significant flooding risks.
- It would not have significant adverse impacts on natural and beneficial floodplain values.

Therefore, the project is consistent with Executive Order 11988, *Floodplain Management*, which requires federal agencies to avoid to the extent possible the long and short term adverse impacts associated with the occupancy and modification of floodplain development.

3.6.5 Wetlands

A delineation was performed as part of the 2000 Re-evaluation to map wetland areas within the proposed right-of-way, the limits of which have not changed for this EA. The Re-evaluation found 2.8 acres of potential wetlands impacts at 43 sites. Most of these sites are small individual seeps or springs: only 12 sites are larger than 0.1 acre, 2 larger than 0.33 acre, and none larger than 0.4 acre. These impact estimates have not changed.

All available measures have been taken to avoid wetland impacts and to minimize effects where practicable. Additional measures could involve modifications during final design such as: minor alignment shifts to avoid or minimize impacts to wetlands, temporary and permanent stormwater management measures, and crossing linear systems at perpendicular angles where possible.

Compensation for unavoidable and necessary wetland impacts from the project will be provided where required, in cooperation with the federal and state water quality permitting agencies. Such compensation would account for lost wetland types and functions and could include enhancement/restoration of existing wetlands or wetland creation onsite or offsite, use of credits

from an approved wetlands mitigation bank, or payments to the Virginia Wetlands Restoration Trust Fund.

3.6.6 Public Water Supplies

The Rivanna Water and Sewer Authority (RWSA) received permits from VDEQ and USCOE under Sections 401 and 404 of the federal Clean Water Act to expand the Ragged Mountain Reservoir (RMR) and construct a new South Fork Rivanna River (SFRR) to RMR pipeline for the purpose of supplying the Charlottesville urban area with its long-term water supply needs.¹⁵ The exact location of the proposed pipeline for the Community Water Supply Plan is not known at this time; however, a potential pipeline corridor¹⁶ has been identified that overlaps with portions of the Route 29 Bypass project location as shown in Figure 1. The Route 29 Bypass project location begins in the middle of the proposed pipeline corridor and, between approximately Barracks Road and Lambs Road, travels along the northern limit of the pipeline corridor. From approximately Lambs Road eastward, the project location and the pipeline corridor are almost identical: both travel north of Rio Road and along the general alignment of Woodburn Road (to remain south of the reservoir but north of Route 29). Until design of both projects is on-going, impacts cannot be assessed; as such, coordination between the design of the pipeline and design of the bypass will be needed to minimize potential conflicts. Construction of the new earthen dam (RMR) is underway with current expected completion by 2014.

The pipeline would provide water supply from the SFRR to the Observatory WTP under normal operating conditions and would be used to refill RMR from the SFRR when RMR is drawn down. This pipeline would also be used during severe drought conditions to provide water from RMR to both SFRR WTP and Observatory WTP in any proportions as system conditions dictate. Preliminary pipeline corridors have been selected, reviewed in the field, and presented to the public for comment. Much of the RMR-to-SFRR pipeline crosses large parcels and has been discussed with property owners. The RMR-to-Observatory WTP route is assumed to parallel an existing pipeline. Acquisitions of 20-foot easements over approximately 25,200 and 11,000 linear feet would be required along the RMR-to-SFRR and RMR-to-Observatory WTP pipelines, respectively.

The SFRR-to-RMR pipeline would be able to transfer a maximum of 20 MGD peak flow for refilling RMR. It must, in addition, have capacity to provide flows to Observatory WTP for continuous operation. When RMR is initially being refilled after a drought, it is likely that water conservation measures will still be in place and that the calculated PDD will not occur. Therefore, an additional allowance of one-half of the Observatory capacity of 10 MGD (which is 5 MGD) is projected to be adequate. This results in a maximum design flow of 25 MGD for the RMR to SFRR pipeline. The pipeline must also be able to convey up to 16 MGD in the opposite direction (from RMR to the SFRR WTP) when storage in SFRR and SHR is depleted at the end of a drought.

3.7 HAZARDOUS MATERIALS SITES

The federal government and the Commonwealth of Virginia, primarily through EPA and VDEQ, respectively, regulate hazardous materials under multiple statutes. Two statutes that regulate materials of primary concern include the Resource Conservation and Recovery Act of 1976

¹⁵ Detailed project information available at www.rivanna.org.

¹⁶ Review of Proposed Pipeline from South Fork Rivanna Reservoir to Ragged Mountain Reservoir Final Report, Rivanna Water and Sewer Authority, February 11, 2010. Map located on page 25.

(RCRA) and the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and their respective amendments.

Previous NEPA analysis and documentation discovered no hazardous waste sites within the impact assessment corridors of any of the alternatives. A search of all EPA and VDEQ databases was completed for this EA within one-half mile on either side of the centerline of the proposed roadway. Four registered facilities are located near the project alignment. The Albemarle County School Complex on Hydraulic Road and Lambs Lane has three of the facilities that are registered with the EPA for handling or producing hazardous wastes. The Albemarle County Schools-Building Services at 2751 Hydraulic Road is registered with the EPA as a conditionally-exempt small quantity generator of hazardous waste, which means that it produces less than 100 pounds of hazardous waste per year. This facility is over 2,000 feet away from the alignment and is currently in compliance with applicable regulations. No spills have been reported at the location; therefore, it does not pose a serious threat to contamination of soils that would be disturbed within the alignment. The Albemarle County Schools-Vehicle Maintenance Facility on Lambs Lane is also registered with the EPA as a conditionally-exempt small quantity generator of hazardous waste. This facility is also currently in compliance with applicable regulations and no spills have been reported at the location. However, this facility is approximately 200 feet away from the edge of pavement and even though no spills have been reported, there could still be the potential for contamination of soils that would be disturbed within the right-of-way. The fourth registered facility with the EPA is the Charlottesville-Albemarle SPCA, located approximately 130 feet from the proposed project; it has an air permit to release hydrogen chloride and particulate matter, including particulate matter less than 10 microns. The facility is currently in compliance with applicable regulations and would not be affected by the project alignment.

No incidents requiring emergency response have been reported in the immediate vicinity of the alignment through the Emergency Response Notification System (ERNS) system. Three spills have been reported in the vicinity through the Hazardous Materials Incident Report System (HMIRS); all were classified as non serious incidents involving non-bulk (containerized) items on existing highways. No storage tanks or petroleum release sites were identified in the vicinity of the project alignment.

Any additional hazardous materials discovered during construction of the project or during demolition of existing structures will be removed and disposed of in compliance with all applicable federal, state, and local regulations. All necessary remediation would be conducted in compliance with applicable federal, state, and local environmental laws and would be coordinated with the EPA, VDEQ, and other federal or state agencies as necessary.

High-level radioactive waste is created by four nuclear power reactors at two sites in Virginia: Lake Anna (Louisa County) and Surry (Surry County near Williamsburg). Neither location is proximal to the project area, nor is transport from either facility projected to travel upon the proposed Bypass. The findings documented in detail in the SEIS have not changed: the potential for a hazardous nuclear material spill or incident that might result in an adverse health impacts or water quality degradation is remote. Preferred routes for vehicles transporting hazardous materials are federally designated and Route 29, from I-66 to I-64, is still currently listed as a preferred route for the transportation of radioactive materials, though the decommissioning of the UVA reactor has minimized its need. The use of US 29 for hazardous material transport, including nuclear material, is not expected to increase from either local or national sources. The decision to not construct a consolidated repository at Yucca Mountain, as previously assumed,

will result in less long-distance transport of highly-radioactive material nationwide. Though Lynchburg has become a major site for nuclear industries, including transport from facilities in Tennessee, Interstate 81 (also federally designated for hazardous material transport) is considered a better route and is the most heavily used for such shipments in Virginia.

Regulation of the safe transportation of hazardous radioactive materials involves several agencies at the federal, state, and local levels. At the federal level, the primary agencies are the Nuclear Regulatory Commission and the U.S. Department of Transportation. NRC regulates container design and manufacturing to ensure that the containers maintain their integrity under routine transportation conditions and during severe accidents. The USDOT regulates a variety of activities, including: highway routing, packaging, labeling, shipping papers, personnel training, loading and unloading, handling and storage, as well as transportation vehicle requirements. Because of the possibility of an accident, hazardous radioactive materials, including used nuclear fuel, are transported in specially designed containers that use multiple layers of steel, lead and other materials to confine radiation from the used fuel. NRC must approve containers used to transport used nuclear fuel. Before NRC certifies containers, they must meet rigorous engineering and safety criteria. In addition, the containers must be able to pass a sequence of accident tests involving forces greater than the containers would experience in actual accidents. Since September 11, 2001, NRC has taken additional steps to protect the public during the fuel transportation. In the event of an accident involving a highly radioactive material, the chances of human exposure or environmental impacts including water quality degradation would be slim, due to these extremely high safety standards in place. This is supported by the past record of transport of nuclear materials: More than 1,300 spent fuel shipments regulated by the NRC have been completed safely in the US during the past 25 years; although there have been four incidents involving those shipments, none have resulted in a release of radioactive material.¹⁷

3.8 INDIRECT AND CUMULATIVE EFFECTS

3.8.1 Indirect Effects

Indirect effects are defined as those effects “which are caused by an action and are later in time or farther removed in distance [than direct effects], but are still reasonably foreseeable” (40 CFR 1508.8(b)). These effects may include growth induced effects or other effects on the natural, social, or physical environments due to changes in land use or population growth. In the case of this project, growth induced effects within the study area are under the direct control of individual landowners. Albemarle County and the City of Charlottesville guide development and growth through zoning and land use policies. The FEIS stated on page IV-10 that:

“Some residents have expressed the concern that the bypass alternatives would cause development in rural areas. It is true that alternatives in these areas could encourage additional residential development, but this development could be restricted to densities permitted under existing zoning and land use regulations. Highway facilities are only one of the factors influencing development patterns. If the County restricts utilities and enforces land use regulations in these areas, it should be able to prevent unwanted commercial development and to limit the amount and density of residential development.”

The selected alternative includes the Alternative 10 bypass, but because of community concerns over induced development, interchanges at Barracks Road (Route 654) and Route 743 have been eliminated so that no access will be provided between the two terminus points.

¹⁷ Safety of Spent Fuel Transportation, US Nuclear Regulatory Commission, March 2003.

This assessment of potential changes in future land use along the project alignment remains valid. Additional interchanges are not a part of the current project; therefore, development in areas adjacent to the bypass will be dependent upon other factors, not access to the bypass. Development at the proposed termini has already occurred, without the bypass construction. UVA and St. Anne's-Belfield School have developed multiple facilities at the southern terminus and extensive commercial development has also occurred both north and south of the northern terminus, also without construction of the bypass.

Places29 notes that the neighborhoods surrounding Route 29 near the northern terminus "are characterized by intense development ... and are among the most urban areas in Albemarle County". Because of the lack of new access provided by the project, it is not expected to either encourage or accelerate any changes in land use that are not already expected by Albemarle County. The implementation of this project would not further affect land use beyond what is already planned for by the County.

Other indirect effects include stormwater runoff which, over time, can degrade water quality downstream of the project and in turn, adversely affect aquatic life. This can be seen in the fact that some of the creeks and rivers in the project area have become impaired over time due, in part, to urban development. Based on the 2003 SEIS, several commitments were identified in the SEIS and included in the ROD to address water quality and the potential for impacts away from the project. Those commitments included the development of an extensive stormwater management plan to protect the South Fork Rivanna River Reservoir. This plan included 17 stormwater retention ponds along the entire project. The six retention ponds located in the reservoir watershed would be designed as wet ponds to achieve a higher pollutant removal efficiency. The project would be designed to capture all of the runoff from the project within the watershed, which would be directed to the retention ponds. The retention ponds would be lined with a membrane to prevent any runoff from migrating. A monitoring program to measure pollutant concentrations at several outfall locations before, during, and after construction would be developed. There would be a dry sump area created at the outfall of each drainage system where runoff is conveyed to a wet pond. The sump area would be sized to hold a volume equal to the capacity of a tanker truck. As a result of these measures, runoff from approximately 10 acres of other development in the Woodburn Road area beyond the project right-of-way would be collected and conveyed to the proposed wet ponds; that runoff currently enters the reservoir untreated. While these commitments will address the potential adverse effects to water quality associated with the project that have identified, they would not address the circumstances responsible for the current states of impairment found in some of the creeks and rivers in the project area.

3.8.2 Cumulative Effects

The SEIS included a lengthy cumulative effects assessment. This section summarizes that assessment and updates it as necessary. Cumulative impacts are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions... [and] can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR 1508.7). The understanding of what are past, present, and reasonably foreseeable future actions is key to the assessment of these impacts. The affected environment or existing conditions in the study area is the collected impacts of all past human actions that have altered the environment, e.g., the University of Virginia and its associated development, the construction of existing Route 29 and Route 250, the Albemarle County School Complex and other schools in the area, residential and

commercial development, the Charlottesville-Albemarle Airport, and the damming of the South Fork of the Rivanna River for a water source. The SEIS included a much more comprehensive list of past actions. Impacts from present actions include ongoing construction of any projects in the area, whether they be public or private such as residential and commercial development and the RWSA pipeline. Reasonably foreseeable future actions are other planned and programmed transportation projects and other planned development that is likely to occur in the immediate area. For purposes of this analysis, this project is treated as a reasonably foreseeable project. Impacts from past, present and reasonably foreseeable actions are important to this assessment if they impact the same resources as those affected by this project.

The 2000 Re-evaluation asserted that “In the context of other ongoing development in the area, the expected cumulative impacts of the project are substantially the same as those reported in the [1993] FEIS and the [1995] FEA, and no new significant cumulative impacts are anticipated.” Further, it noted that “The proposed project lies within Albemarle County's designated growth areas and does not disturb or otherwise encourage development of rural land outside the growth areas.” While the effects discussion in the Re-evaluation was discussed in general terms, the subsequent 2003 SEIS went on to thoroughly itemize all transportation projects and residential, commercial, and institutional development projects recently constructed or planned within Albemarle County, the Rivanna Reservoir watershed, and more specifically, the Ivy Creek subwatershed. Following this itemization, it was observed that existing development and continuing agricultural activities in the watershed have the potential to degrade water quality in the Reservoir, which was the primary focus of the document, and that “while the Route 29 Bypass will undoubtedly contribute to these impacts, the incremental contribution of the project would be relatively small.”

In this EA, the time frame for the analysis has been extended to the design year of 2040. The geographic scope for the analysis not only includes the project footprint but also includes the geographic limits of the resources that will be impacted by this project, such as the limits of the reservoir and watersheds boundaries. Albemarle County, which has continued to experience growth since the project's initiation in the early 1990s, is expected to increase in population and employment by over 50 percent more between 2010 and 2040, as highlighted in the Populations section of Table 5. In addition, other future actions that affect the same resources as those affected by the bypass include continued university operations in the vicinity of the southern terminus and further development at the northern terminus for which funding commitments have been made. Finally, transportation projects that are contained in the MPO's fiscally-constrained long range plan within the project area that have the potential to impact some of the same resources include the following (projects that do not include a funding commitment or are speculative are not considered reasonably foreseeable and are not included in the analysis):

- Route 29 Corridor and Access Management Study from Greenbrier Road to the Greene County Line to identify potential improvements to improve safety and access.
- Retrofit Georgetown Road (Route 656) to create an urban cross-section providing for continuous pedestrian and bicycle access.
- Complete widening of Route 29 from four to six lanes between South Fork of Rivanna River and Timberwood Boulevard.
- Route 29 and Rio Road Grade-Separated Interchange.
- Extension of Berkmar Drive from Hilton Heights Road to Lewis and Clark Drive, including a bridge over the South Fork Rivanna River.

Albemarle County is divided into four Rural Areas and a Development Area. The designated Rural Areas, about 690 square miles, make up approximately 95 percent of the county and surround the designated Development Areas and the City of Charlottesville. The proposed project lies within the Development Area bordering Rural Area 1. The Route 29 Bypass will add interchanges only in designated Development Areas at the termini of the roadway.

Protecting rural land uses provides an opportunity to conserve natural, scenic, and historic resources (through the maintenance of farmland, forested areas, and other natural areas) and fiscal resources (by limiting development and lessening the need to provide public services, i.e., public water or sewer service, to wide areas of the County). Several tools for protecting the County's Rural Areas are in place, including reduced tax rates for lands in agricultural, forestal, horticultural, and open space uses; an agricultural and forestal districts program that helps to prevent intensification of use; and the Acquisition of Conservation Easements (ACE) program.

In 2000, Albemarle County established the ACE Program, one of the first three purchase of development rights (PDR) programs in Virginia. The program gives landowners the opportunity to protect family farms in Albemarle County and their unique open space resources by placing a conservation easement on a portion of their land. A conservation easement represents a voluntary agreement negotiated between a landowner and a public agency or charitable conservation organization in which the landowner agrees to place specific restrictions on the use and development of their property. It provides a lasting benefit to the public through the protection of open space, and it supports the goals of the Comprehensive Plan by adding an additional tool to protect the County's natural, scenic, cultural and historical resources; promoting a stable, sustainable, and vital agricultural and forestry base; and protecting the County's surface and groundwater supplies.

With regard to the latter, additional recent steps taken by Albemarle County to protect water quality include amending the Water Protection Ordinance in 2007 to include the watershed of the North Fork Rivanna River public water supply intake in the definition of "water supply protection areas" and extending the requirement of stream buffers to all intermittent streams in that watershed. Albemarle County amended the Water Protection Ordinance in 2008 to expand the stream buffer requirements to all intermittent streams in the Rural Areas, providing the entire Rural Areas the same protection previously afforded only to specific water supply protection areas. The 2008 amendments also clarified the ability for development projects to impact buffers with stream crossings and set specific design criteria for those crossings.

The buffers and additional measures have been established to minimize impacts to water quality, contamination of water resources, and the deposition of sediment, particularly in the Rivanna Reservoir. All together, soil erosion from natural events, from land use in the agricultural area, from land disturbances in the developed areas, and from re-suspension of flood plain deposits created during the 19th century (stream bank erosion), are likely the causes of significant amounts of sediment becoming trapped within the reservoir. Thus, although the proposed bypass may pose a certain incremental additional impact and risk for contamination of the Reservoir, this risk represents only a small part of the total.

The South Fork Rivanna Reservoir was studied in 2010 to determine the feasibility of dredging accumulated sediments, which determined that over one million cubic yards of sediment will need to be dredged from the South Fork Rivanna Reservoir. At this point in time, RWSA has received "Conceptual Proposals" to conduct the work. Other recent or ongoing activities or actions that have taken place since the completion of the 2003 SEIS that are expected to help improve water quality in the reservoir and minimize cumulative impacts include the following:

- Albemarle County’s Comprehensive Plan, specifically the Natural Resources chapter, applies to both the Development Areas and the Rural Area and includes goals and measures relating to the concept of sustainability; the physical setting of Albemarle County; open space resources, including natural, scenic, and historic resources; and open space planning. Protection of water resources (including surface water, surface drinking water, and groundwater) is essential to Albemarle County, and the County shares the statewide concern for the water quality of the Chesapeake Bay. The County’s water resources program includes watershed protection for drinking water supplies, groundwater protection, Chesapeake Bay protection, stormwater management, and implementation of the best management practices.
- The Rivanna River Basin Commission (RRBC) was enabled by Virginia statute in 2004 and has been meeting since 2007. The RRBC is charged with providing guidance for the stewardship and enhancement of the water and natural resources of the Rivanna River Basin, including suggesting appropriate solutions to identified problems that foster resource stewardship for the environmental and economic health of the Basin.
- As described in Section 3.6.2, the USEPA developed the Chesapeake Bay TMDL (December 2010) and is working with Bay jurisdictions to develop the Phase II Watershed Implementation Plan (WIP II) to achieve pollution load reductions of nutrients and sediments. As part of this effort, the City of Charlottesville and Albemarle County submitted information about current land use; current level of best management practices (BMPs) for agriculture, urban, and other sectors; planned implementation of BMPs by 2025; and strategies and resources needed to meet 2025 implementation goals.
- In July 2012, the Moores Creek Advanced Wastewater Treatment Facility celebrated the completion of its \$48 million upgrade, the first of its kind since the mid 1980s. The upgrades included installation of new technologies to maximize water treatment as well as the addition of new structures that increase the plant's peak flow capability to 38 million gallons per day. The upgrades drastically reduce the amount of nitrogen and phosphorous that is deposited in the Chesapeake Bay, creating algal blooms. The state-of-the-art facility can capture methane gas, burn it in a generator, and keep it out of the environment. The facility upgrades are part of a massive effort to clean local water sources and ultimately the Chesapeake Bay.
- The most severe effects of increased sedimentation and erosion typically occur during construction, but this will be prevented and mitigated with the enhanced erosion and sedimentation controls described in Section 4.8 of the 2003 SEIS and included in the subsequent ROD. In addition, Virginia's new stormwater management regulations encourage BMPs that effectively manage water quality by increasing infiltration. As described in Section 3.6.1 of this EA, the bypass project will require compliance with the applicable water quality requirements contained in the new July 2012 VSMP Regulations, and the special conditions of any required permits for work in and around surface waters would be incorporated into construction contract documents.

Table 7 summarizes the cumulative effects of the Route 29 Bypass project.

Table 7. Summary of Cumulative Effects

Resource in Study Area	Impacts from Past and Present Actions	Impact from Proposed Project	Foreseeable Future Action	Cumulative Effects
Recreational Resources associated with Albemarle County School Complex	Residential and business development surrounding Hydraulic Road/Rio Road west increased traffic and noise near Albemarle County Schools Complex.	Right-of-way impacts of 13.05 acres or 6% of the entire property.	No other future actions have been identified in this area.	Cumulative effects on this resource are low.
Water Quality	Construction of roads, residential and commercial development, development of public facilities, etc. have impaired water quality, affected groundwater, resulted in sediment and pollutant loading in the reservoir, led to the destruction of wetlands, encroached on floodplains, impacted streams, and impacted aquatic life..	Potential impacts to 24 streams and 2.8 acres of wetlands.	According to the Grounds Plan of 2008, UVA is planning future development as infill concentrated within the Route 250/29 Bypass area and therefore, the Meadow Creek watershed. Potential temporary impacts to the Ivy Creek sub-watershed could occur during construction of the Georgetown Road retro-fit project. The other transportation projects have the potential to impact the South Fork Rivanna River outside of the reservoir watershed. Future land use around the corridor within the county is planned to remain in rural residential use south of the South Fork Rivanna River. North of the river, development is intensifying around the communities of Hollymead and Piney Mountain, including high density residential, office, and light industrial uses.	The impacts from the project are expected to be low because of the mitigation that has been committed to but overall, cumulative effects as they relate to water quality and water resources are expected to be medium.
Threatened, and Endangered Species	Development of UVA, city, and residential areas in county resulted in stream encroachment, stream culverts, and bridges over streams that potentially disturbed mussel habitat. The degraded condition of Ivy Creek is the likely consequence of ongoing and historically intense land use upstream, intense land use in the local riparian zone, or both.	No impacts to potential habitat of James spinymussel and not likely to jeopardize the continued existence of the species	Continued development within area of watershed could further degrade stream quality and potential habitat.	Future residential development is limited within the reservoir watershed. Future transportation projects are also limited. This project would include time of year restrictions to minimize impacts to the species. Therefore, the cumulative effects on this resource are expected to be low.

Table 7. Summary of Cumulative Effects

Resource in Study Area	Impacts from Past and Present Actions	Impact from Proposed Project	Foreseeable Future Action	Cumulative Effects
Air Quality	Decreases in air quality as development and traffic increased.	No violations of NAAQS; project is in an area that is in attainment of all NAAQS, and conformity does not apply.	Continued development north of study area in Hollymead and Piney Mountain will lead to increased traffic volumes on Route 29; an increase in vehicles will lead to an increase the amount of mobile emissions emitted in the area.	Continuing improvements in vehicle and fuel technology and resulting cleaner emissions will more than offset adverse effects from increases in volumes of vehicles. Since 1980, emissions associated with the six common pollutants (CO, lead, NO _x , VOC, PM, and SO ₂) have decreased 63% while VMT has increased 94%. Cumulative effects on this resource are expected to be low.
Noise	Increase in overall noise levels as development expanded along Route 29, Route 250, Barracks Road, and Hydraulic Road/Rio Road west and vehicle trips increase.	Noise impacts to 56 residential properties and athletic fields at two Albemarle County schools.	Continued development north of study area in Hollymead and Piney Mountain will lead to increased traffic volumes on Route 29, which will increase overall noise levels in the corridor.	Cumulative effects as they relate to noise impacts are expected to be low because the receptors that will experience noise impacts from the project are too far removed from the other reasonably foreseeable actions that have been identified to be influenced by them.

4.1 INTRODUCTION

Throughout the development of the project, FHWA and VDOT have affirmatively sought public input through multiple citizen information meetings, formal public hearings, and meetings with interest groups. This extensive coordination and the input received are described in the FEIS and the SEIS. Given the high level of public interest in the project, another citizen information meeting will be held to afford the public an opportunity to review the latest information, including this EA. Extensive consultation with local, regional, state, and federal agencies also has been undertaken throughout project development. This consultation has continued for purposes of this EA. Local, state, and federal agencies were contacted early in the current study and asked to identify issues of concern to help frame the scope of the EA.

4.2 AGENCY COORDINATION

The following agencies were contacted as part of the scoping process. Those marked with an asterisk responded to the request for input.

- * U.S. Army Corps of Engineers
- * U.S. Environmental Protection Agency
 - U.S. Department of the Interior, Fish and Wildlife Service
 - Virginia Department of Agriculture and Consumer Services
- * Virginia Department of Conservation and Recreation
- * Virginia Department of Environmental Quality
- * Virginia Department of Forestry
- * Virginia Department of Game and Inland Fisheries
 - Virginia Department of Health
- * Virginia Department of Historic Resources
 - Virginia Outdoors Foundation
- * Rivanna River Basin Commission
 - Thomas Jefferson Planning District Commission
- * Charlottesville-Albemarle Metropolitan Planning Organization
- * Rivanna Water and Sewer Authority
- * Albemarle County Executive (Director of Community Development responded)
 - Albemarle County Board of Supervisors
 - Charlottesville City Manager

4.3 OTHER CORRESPONDENCE

In addition to the agency coordination efforts, unsolicited correspondence was received from several organizations and individuals, including:

Charlottesville-Albemarle Transportation Coalition
Jack Jouett Bypass Advisory Committee
Piedmont Environmental Council
Sierra Club, Piedmont Group
Sierra Club Virginia Chapter
Southern Environmental Law Center

4.4 SUMMARY OF ISSUES IDENTIFIED

Based on comments received from responding agencies and from other organizations and individuals, the following issues were identified:

- **Transportation**
 - Update traffic
 - Consider other alternatives, including bicycle and pedestrian facilities
 - Berkmar Drive extension
 - Other projects in CLRP (Rio Road interchange, US 250 Bypass interchange)
 - Local and regional planning (CLRP, Places29, US 29 North Corridor Transportation Study)
 - Context-sensitive design
- **Land Use**
 - Local and regional planning (*Places29*, County’s comprehensive plan)
 - Updated county policies re land use, zoning, transportation, rural areas, natural resources, cultural assets
 - New development along US 29 north of project
 - New development in Reservoir watershed
 - Update community facilities information
- **Air Quality**
 - Air conformity
 - Air toxics
 - Greenhouse gasses
 - Health effects of vehicular emissions
 - Construction impacts
- **Water Quality and Wetlands**
 - Identify waters of the US
 - Pollutant loading and potential hazardous materials issues for South Fork Rivanna River
 - Reservoir
 - New regional water supply plan
 - Stormwater impacts
 - Chesapeake Bay Preservation Act
 - Wetlands

- Impaired waters
- Chesapeake Bay Model for water impacts assessment
- Mitigation, erosion and sediment control, stormwater management
- **Historic Properties**
 - Archaeological sites at northern terminus
- **Threatened and Endangered Species**
 - James spiny mussel (federal and state endangered)
 - Green floater (state threatened) historically documented in South Fork Rivanna River
 - Ivy-Creek-Montvue Stream conservation Unit is located downstream of project and is associated with the James spiny mussel. Ivy Creek is designated by VDGIF as a “Threatened and Endangered Species Water” (a water harboring or potentially harboring a threatened or endangered species, in this case, the James spiny mussel)
- **Hazardous Materials**
 - Keeping hazardous materials out of South Fork Rivanna Reservoir
 - Pesticide use during construction
 - Transport of hazardous materials, including nuclear materials, on proposed bypass
- **Noise**
 - Update noise analysis
- **Indirect and Cumulative Effects, including Induced Development**

4.5 CITIZEN INFORMATION MEETING

VDOT will hold a citizen information meeting for this project. The purpose of the meeting will be to provide an opportunity for the public to review current information about the project, including this EA. The public will be invited to provide input and comments on the EA. Substantive comments on the EA will be addressed in a revised EA prior to a final decision by FHWA.

