SECTION III: EXISTING ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

In accordance with FHWA guidance, this Supplemental Final Environmental Impact Statement (SFEIS) incorporates by reference the Final Environmental Impact Statement (FEIS) and the subsequent Record of Decision (ROD) for the Appalachian Corridor H Project, both issued in 1996. The Parsons-to-Davis Project Supplemental Draft Environmental Impact Statement (SDEIS) was signed and circulated for public and agency comment in December 2002.

In 2003 and 2004, Preferred Alternative Reports were prepared and circulated for agency concurrence. The Revised Original Preferred Alternative (ROPA) has been identified as the preferred alternative for the Parsons-to-Davis Project. This SFEIS incorporates updated information and analysis since the December 2002 SDEIS, as appropriate. Substantive comments received on the SDEIS, are addressed throughout the document and corresponding responses are provided in Appendix A. Substantive comments received on this SFEIS will be addressed in the Amended Record of Decision.

3.1 INTRODUCTION

In this section, the existing environment is described and the environmental consequences of the alternatives carried forward for detailed analysis will be identified and compared. For some categories of potential impact, information has not changed since the 1996 Corridor H FEIS. Where appropriate, the information has either been incorporated by reference from the 1996 Corridor H FEIS and/or 1996 Corridor H ROD or summarized from technical reports (e.g., Biological Assessments prepared as part of Section 7 Endangered Species Act coordination with the US Fish and Wildlife Service USFWS). Federal Highway Administration (FHWA) regulations implementing the National Environmental Policy Act (NEPA) state that "The supplemental EIS needs to address only those changes or new information that are the basis for preparing the supplement and were not addressed in the previous EIS" (23 CFR 771.130(a)). Those regulations were followed in the development of this SFEIS.

3.1.1 OVERVIEW OF THE STUDY AREA

The Study Area (Figure I-3) is an approximately 8,600-acre (13.4-square mile) area located in Tucker County, West Virginia. The Study Area is dominated by mixed deciduous and evergreen forests that are intermixed with wetlands, areas that have been disturbed by extensive surface coal mining activities, and small areas of mountaintop pasture land. The North Fork of the Blackwater River flows south through the Study Area. The Study Area includes the community of Thomas and the neighborhoods of Benbush, William, Railroad Hill, and Coketon. The town center of Davis is located immediately southeast of the Study Area. The majority of development in the Study Area is associated with either Thomas or Davis, with the western half of the Study Area largely undeveloped. As will be discussed in the land use section below, most of the property in the Study Area is privately held by the Western Pocahontas Land Corporation. While the Blackwater Area is not within the Study Area, potential impacts associated with this area are included in the following analyses.

3.2 SOCIO-ECONOMIC ENVIRONMENT

The following are discussions describing the existing social and economic conditions in the Study Area and addressing the potential impacts of the proposed Parsons-to-Davis Project on those conditions. The social and economic environment potentially affected by the proposed project includes the Study Area, the communities of Thomas and Davis and their neighborhoods, and, to a

certain degree, Tucker County as a whole. Because population and economic data, in particular, are available predominately at the county level, this analysis describes this larger environmental area. Where possible, however, the conditions and potential impacts within the Study Area and its communities and neighborhoods have been disaggregated and emphasized.

A variety of public reports and publications were utilized in this analysis. Additionally, interviews with individuals supplemented the research effort. Finally, field observations were used to verify the public reports, publications and interviews. Updated information, after the circulation of the Parsons-to-Davis SDEIS in December 2002, is included within this SFEIS.

3.2.1 ECONOMIC ENVIRONMENT

3.2.1.1 Existing Conditions

The 1996 Corridor H FEIS provided a description of the existing economic environment in Tucker County. Updated census data confirms that some population and economic trends have not changed since the approval of the Corridor H FEIS in 1996. The percent change in population between 1980 and 1990 reported in the 1996 Corridor H FEIS was -3% for Tucker County, while the change between 1990 and 2000 was -5%. The 1980 to 1990 changes in population in Thomas and Davis were -21% and -18%, respectively. Those trends were similar in the following decade as shown in Table III-1 (-21% and -22%, respectively). The trend in Parsons, however, has shifted from a shrinking population between 1980 and 1990 (-23%) to a population holding steady with 1% growth between 1990 and 2000. Table III-1 shows the recent trends for these and other Tucker County communities. Statistically, population and economic trends have not changed significantly since the December 2002 SDEIS, therefore, the information presented in the SDEIS remains valid in this SFEIS.

Table III-1
Tucker County Population and Employment

Jurisdiction	1990 Population	2000 Population	1990-2000 Percent Change	2003 Population estimate*
Tucker County	7,728	7,321	-5%	7,160
Davis	799	624	-22%	600
Hambleton	265	246	-7%	246
Hendricks	303	319	5%	312
Parsons	1,453	1,463	1%	1,440
Thomas	573	452	-21%	431

Source: US Census Bureau.
*July 1, 2003 population estimate.

Table III-2 and Table III-3 present the labor force, employment statistics, and income and poverty levels for Tucker County and its communities. Since 1990, the unemployment rate has fallen in Tucker County from 12.1% to 6.3% (Table III-2); however, the percent of people below the poverty level has remained essentially the same (17% in 1990 as reported in the 1996 Corridor H FEIS versus 18% in 2000, Table III-3). Within the Study Area in 2000, the poverty rate was 16%. The average income level for Tucker County was $8,978 in 1990, and had risen to $16,349 by 2000. The average income level within the Study Area was $17,027 in 2000.

Table III-2
Tucker County Labor Force and Employment

Census Statistic	1990	2000
Civilian Labor Force	3,502	3,330
Total full-time and part-time employment by place of work	3,522	3,121
Total Unemployment	422	209
Unemployment Rate	12.1%	6.3%

Source: US Bureau of Economic Analysis and US Bureau of Labor Statistics.

Table III-3
Tucker County Income and Poverty Levels

Jurisdiction	2000 Below Poverty Level	2000 % Below Poverty Level	2000 Per Capita Income
Tucker County	1,302	18%	$16,349
Davis	92	15%	$22,399
Hambleton	40	17%	$12,835
Hendricks	76	23%	$21,315
Parsons	276	19%	$16,565
Thomas	63	14%	$14,918
Study Area*	218	16%	$17,027

Source: US Census Bureau.
*Aggregated CT 9652 BG 3 and CT 9653 BG 1.

One major purpose of the Parsons-to-Davis Supplemental Environmental Impact Statement (SEIS) has been to assess alternative options that pass north of the Blackwater Area. As part of the 2000 Settlement Agreement (Appendix B), a Community Advisory Group (CAG) was formed to participate in the study. The CAG's scoping letter of July 13, 2000 (provided in Appendix A) states, "In studying alternative routes to the north of Thomas, it is desirable to maximize the potential for development and to control how development occurs." The letter requests that any alternative of Corridor H provide connections both north and southwest of Thomas with US 219. The CAG letter also indicates the advantages of these connections:

1. Northern connection would minimize truck traffic in the downtown shopping, historic, recreational, and residential areas of Thomas, would provide access to the Thomas business district, and would "open up" the area north of Thomas for residential development.
2. Southwestern connection would provide access to the old airport area for industrial and residential development and provide access for the ambulance authority.

The City of Thomas' Development Strategy (1998) also makes recommendations for the Corridor H alternative with respect to economic environmental impacts. The strategy document proposes a northerly shift away from the Original Preferred Alternative (OPA) for two reasons (specific connections were not identified):

1. To prevent Corridor H tourist traffic from bypassing Thomas; and,
2. To reduce truck traffic through Thomas.

The existing truck and tourist traffic conditions and the potential impacts of the alternatives carried forward for detailed analysis on those conditions are examined in the discussions below. Additional information regarding the CAG is provided in Section VII: Comments and Coordination; CAG comment letters are provided in Appendix A.

Truck Traffic

This analysis addresses the question of how the truck travel patterns in and around Thomas would change if Corridor H were in place today. The analysis includes an assessment of how local traffic would be affected by the connections associated with any one of the Blackwater Avoidance Alternatives (1D East and West, 1E, and 1G East and West). Preliminary design of the Blackwater Avoidance Alternatives includes connections at US 219 west of Thomas, US 219 north of Thomas, and WV 32/93 north of Davis. For this analysis, it was assumed that there would be no difference between the five Blackwater Avoidance Alternatives because these alternatives are so similar in location and length. The Truck Route was included in the Revised Original Preferred Alternative (ROPA)/Preferred Alternative to address truck traffic concerns in Thomas based on the analysis presented in the SDEIS. The truck traffic patterns that would be associated with the ROPA/Preferred Alternative and Alternative 2 were assumed to be the same as those for the OPA, taking into account that each of these three alternatives includes the Truck Route for bypassing downtown Thomas. No induced traffic impacts, due to development or regional traffic patterns outside the immediate Study Area, were considered for this study.

Traffic Counts

The traffic data for this analysis were derived from traffic counts conducted during October 1999. The total of all trucks counted in downtown Thomas was 440, including 220 tractor trailers per day. The actual numbers of trucks on any given day may vary from these counts. Discussions with officials of companies generating truck traffic indicate that weekly or monthly variances in truck traffic in the area are not unusual. There are no permanent count stations in the Study Area that could convey the annual spread of high and low truck Average Daily Traffic (ADT) and the frequency of peaks generated by local economic conditions. Therefore, in interpreting the results discussed below, one should not concentrate on the actual number differences but on the magnitude of the differences reported. Population and economic trends have not changed substantially since the December 2002 SDEIS, nor have land use or economic changes occurred that would be expected to alter travel patterns in the Study Area. Therefore, the 1999 traffic data and the information presented in the SDEIS remains valid in this SFEIS.

Composition of Truck Traffic

For the purposes of this study, truck traffic is defined as any vehicle with six or more tires. This includes small trucks (two axle, six tires), buses, single unit multiple axle trucks (three or more axles), and trailer trucks (single or multiple trailers). Because the concerns of Thomas are likely to reflect a focus on heavy truck traffic (i.e., tractor-trailers), the volume of that traffic has been "broken out" from the total truck traffic.

Tourist Travel Patterns

This analysis addresses the question of how tourist travel patterns in and around Thomas would change if Corridor H were in place today. The analysis also addresses how the three connections of the Blackwater Avoidance Alternatives would redistribute tourist traffic. For this analysis, it was assumed that there would be no difference between the five Blackwater Avoidance Alternatives (1D East and West, 1E, and 1G East and West) in total tourist trips because the alternatives are so similar in location and length. Also, it was assumed that for

Alternative 2 tourist travel patterns would be similar to those for the OPA. The ROPA/Preferred Alternative has a connection; however, unlike the OPA the connection is substantially farther to the west than the connections associated with the Blackwater Avoidance Alternatives. Therefore, the ROPA/Preferred Alternative was also assumed to have tourist travel patterns similar to those for the OPA.

Because there are no major roads (i.e., interstates or Appalachian highways) that currently provide access to the various recreational opportunities near the Study Area (e.g., Blackwater Falls State Park, Canaan Valley), a variety of travel routes are available depending on personal preference, desired side trips, and road conditions. Therefore, for this study, the most likely travel routes had to be inferred from the relationship between the origin of visitors and the various recreational opportunities. For the SFEIS, the most recent visitor-origin information available was reviewed, and the assumptions of this analysis were confirmed as reasonable.

The first step in the route determination process was to determine the total number of visitors to tourist attractions in eastern Tucker County. Total visitor days for 1999 and previous years, when available, were collected from Blackwater Falls State Park, Canaan Valley State Park, Fairfax Stone State Park, Timberline Four Seasons Resort, White Grass Cross-Country Center, and wilderness areas within the Monogahela National Forest (MNF) (Dolly Sods and Otter Creek). Visitation data, discussions with park and recreation facility managers, and a visitor profile for the Potomac Highlands (Witt and Fletcher, 2004) provided insight into the geographic origin of visitors and percentage of overnight visitors. Comparatively less data were available on the origin of day-visitors; therefore, a population density analysis was completed in geographic information systems (GIS) to determine the total population within an 80-mile radius of eastern Tucker County. This analysis identified the location and density of potential day-tourists to the area.

Following collection of these data, the most direct routes were identified from state highway maps and directions provided by the tourist attractions themselves. Travel routes, also known as travelsheds, were determined for each of the major cities within the mid-Atlantic region (Pittsburgh, Baltimore, Washington, D.C., Richmond, Roanoke, Charleston, Wheeling, etc.) Four routes into eastern Tucker County were established (US 219 from the north, WV 93 from the east, WV 32 from the south, and US 219 from the west [Parsons]) and associated geographically with a tourist travelshed and its share of day and overnight visitors to the region.

Total tourist visitor days were converted to ADT volumes. Based on tourist travelsheds, each of the four routes into the Study Area was allocated a portion of the tourist traffic volumes.

Figure III-1 represents the existing directional distribution of tourist traffic based on the previously described methodology. Currently, the largest share of tourists (70 percent) accesses the tourist attractions from the south along WV 32. Using this route, tourists reach their destination without having to pass through Davis or Thomas. These tourists are generally from the Washington, D.C. area, Virginia, and portions of West Virginia. Approximately 30 percent of tourists, those from Pennsylvania, Ohio, western Maryland, and portions of West Virginia, currently access the recreational attractions from the west or north along US 219 and pass through both Thomas and Davis on their way to the attractions. The amount of tourists using WV 93 to enter the Study Area is considered insignificant, as other routes prove to be more efficient.

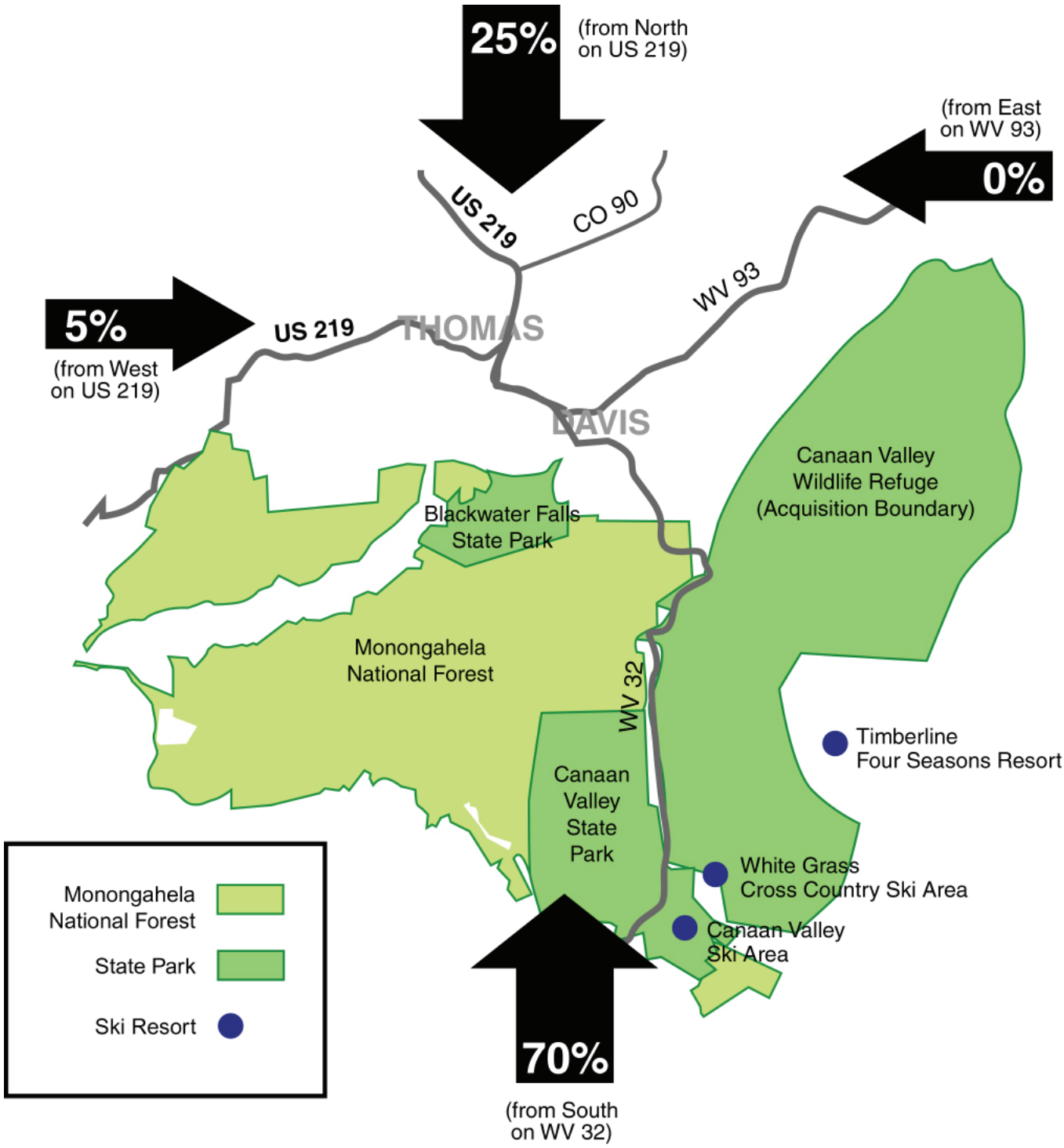

Figure III-1
Existing Tourist Traffic Directional Distribution

3.2.1.2 Potential Impacts

Truck Traffic

Table III-4 presents the effect of the various alternatives being considered on truck traffic passing through downtown Thomas. Conclusions are derived from diversion assumptions based on the observed truck data and discussions with companies generating truck traffic in the area. The ROPA/Preferred Alternative, the OPA, and Alternative 2, each of which includes the Truck Route, would affect at least a 45 percent reduction in total trucks in downtown Thomas (this is the amount estimated to use Corridor H without the truck bypass), but more likely would reduce trucks in downtown Thomas by 80 percent as a result of the truck bypass. The 80 percent reduction would include a 90 percent reduction in heavy trucks.

It is projected that connecting US 219 to Corridor H both west and north of Thomas with any of the Blackwater Avoidance Alternatives would also result in an 80 percent reduction of total truck traffic in downtown Thomas. Heavy truck traffic would be reduced by 90 percent with any of the Blackwater Avoidance Alternatives.

Table III-4
Effects of Alternatives and Connection Scenarios on Truck Traffic in Downtown Thomas

Calculation	Existing Truck Traffic (1999)		Alternatives Carried forward for Detailed Analysis			
			Blackwater Avoidance Alternatives		ROPA/Preferred Alternative, OPA and Alternative 2[1]	
	Total Trucks	Tractor-Trailers	Total Trucks	Tractor-Trailers	Total Trucks	Tractor-Trailers
ADT of Trucks	440	220	85	20	85	20
Percent Change	--	--	-80%	-90%	-80%	-90%

[1] All three of these alternatives include the Truck Route which provides a means for trucks to bypass downtown Thomas.

Tourist Travel Patterns

The alternatives will change the directional distribution of tourist traffic. For the comparative analysis of impacts to local business districts, it was assumed that the origin and number of tourists will remain the same as the existing conditions. Given the assumption that the ROPA/Preferred Alternative would have similar tourist travel patterns to that of the OPA, it would be expected that 10 percent of the tourists coming from the south would continue to utilize WV 32 and that 15 percent would continue to utilize US 219 from the north (Figure III-2). The remainder, 75 percent of tourist traffic, would utilize Corridor H and pass through Davis on their way to recreational facilities. The OPA and Alternative 2 would be expected to experience this change in travel pattern as well. With respect to the ROPA/ Preferred Alternative, this analysis represents a slightly conservative estimate because, unlike the OPA and Alternative 2, the ROPA/Preferred Alternative provides an interchange location approximately six miles west of Thomas at Tucker County High School (TCHS). Tourist traffic seeking an alternative route to the recreation attractions could choose this interchange and travel along US 219 through Thomas.

This analysis assumes that all of the exits for the Blackwater Avoidance Alternatives (i.e., US 219 west and north of Thomas and WV 32 at Davis) would be signed as providing access to the recreation attractions. Travelers along Corridor H could choose any of the three exits to reach the recreation attractions. The difference between the northern and western US 219 connections is not relevant to this issue, as both connections "feed" traffic through the Thomas business district on its way to the recreational facilities.

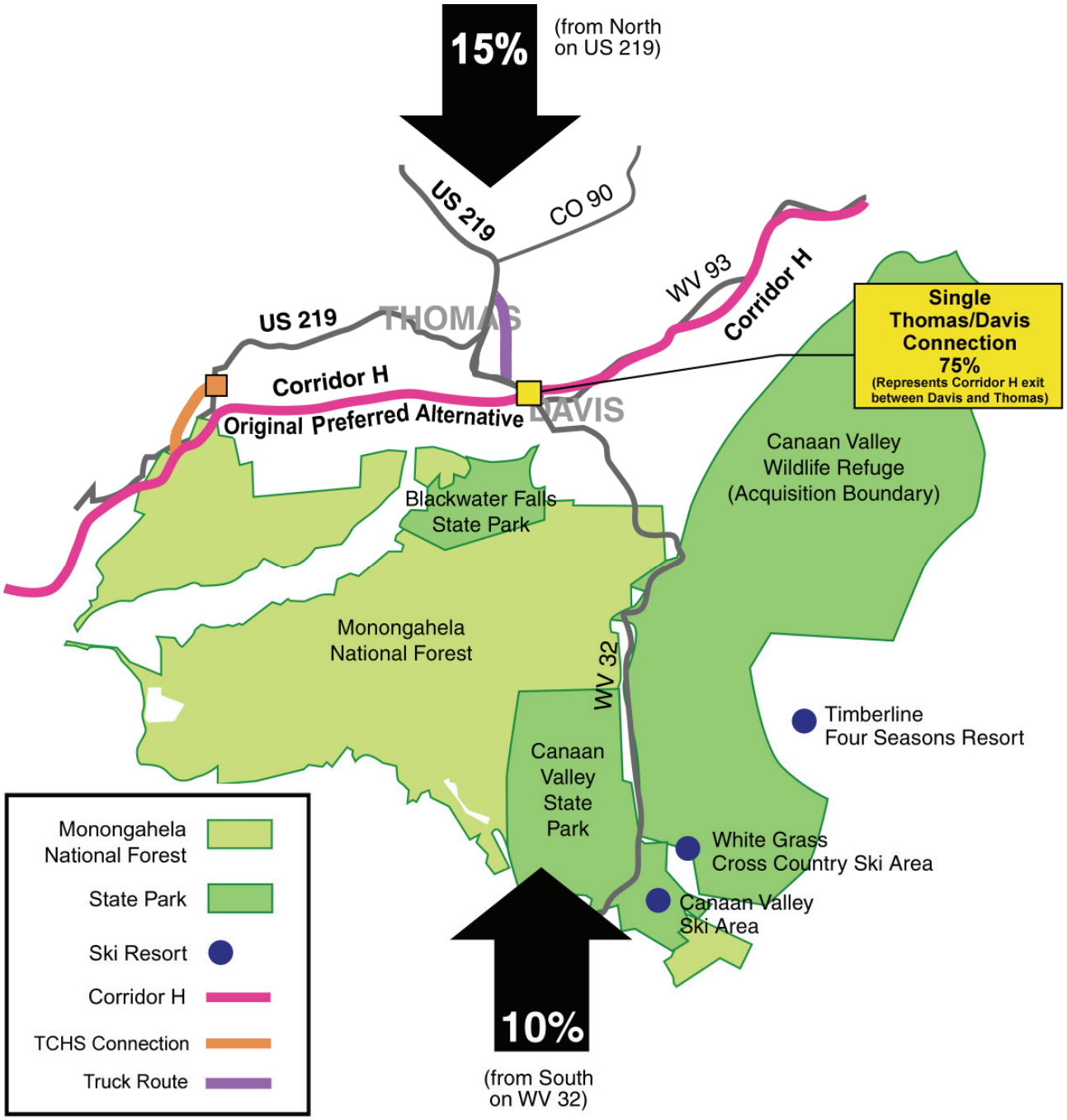

Figure III-2
Tourist Traffic Directional Distribution with Corridor H – ROPA/Preferred Alternative[1], OPA and Alternative 2

[1]This represents a slightly conservative estimate of travel patterns through Thomas with the ROPA/Preferred Alternative because this analysis has assumed travelers will not opt to use the TCHS exit along the ROPA/Preferred Alternative (six miles west of Thomas).

A westbound traveler on Corridor H would use the first and most logical exit to access the area - the connection at Davis. Eastbound travelers on Corridor H would have three signed exits to access the recreational attractions in the area under the Blackwater Avoidance Alternatives. As with the westbound travelers, the Davis connection is the closest to the attractions; however, a portion of the tourists traveling on Corridor H from the west could select any of the exits signed for those attractions. Depending on the need for services and the draw of historic downtown Thomas, eastbound tourists may prefer to access the area at the western or northern connection. The presence of Corridor H connections in the Thomas area has a substantial effect on the potential tourist traffic traveling through the Thomas business district.

Figure III-3 illustrates the tourist travel patterns if any of the Blackwater Avoidance Alternatives (1D East and West, 1E, and 1G East and West) were constructed. Fifteen percent of tourists, represented by travelers from Pennsylvania or western Maryland, would continue to travel on US 219 to reach the recreational attractions, as the 2-mile long portion of Corridor H between the north connection and the Davis connection would not provide travel time savings over US 219 through Thomas. The tourists exiting at the Davis connection have traveled from the eastern points of origin (the Washington D.C. area or eastern Maryland).

Tourists traveling from the west account for 45 percent of the total tourist traffic. It is likely that those unfamiliar with the area and those interested in attractions of the Thomas business district would use the first signed exit (the west connection). These eastbound tourists may also use the north or Davis connection, but Figure III-3 represents the potential tourist traffic that would enter downtown Thomas based on highway signage.

Currently, without Corridor H, the estimated percentage of tourists that pass through Thomas is 30 percent. If the ROPA/Preferred Alternative, OPA or Alternative 2 were constructed, most of the potential tourist traffic would be routed through the Davis connection (bypassing Thomas); approximately 15 percent of total tourist traffic would enter downtown Thomas. As noted for the Blackwater Avoidance Alternatives, however, the 45 percent of motorists approaching from the west could choose to exit, based on signage or experience, on the west side of Thomas in order to visit Thomas on the way to other attractions. The ROPA/Preferred Alternative enables this choice with the inclusion of the TCHS connection. Nevertheless, it appears the ROPA/Preferred Alternative would result in some reduction in pass-through tourist traffic, which could have an adverse impact on businesses in Thomas and would not be supportive of the goals of the City of Thomas Development Strategy (1998).

Should any one of the Blackwater Avoidance Alternatives be constructed, 60 percent of all tourist traffic would potentially pass through Thomas via US 219 from the north or the western Thomas Corridor H connection. (Since it would place tourists further north from the tourist attractions than either of the adjacent exits, the northern Thomas connection is assumed not to be a logical exit for tourist traffic.) It is reasonable to assume that any increase in the tourist traffic in Thomas, as predicted with any of the Blackwater Avoidance Alternatives carried forward for detailed analysis (1D East and West, 1E, and 1G East and West) would have some positive economic consequences for Thomas.

In general, as the connections on Corridor H are planned to be designed and signed, tourist traffic not attracted by the amenities and shopping opportunities in the Thomas business district can easily bypass it, reducing through-tourist traffic; while tourists interested in the Thomas business district would have the opportunity to easily access it.

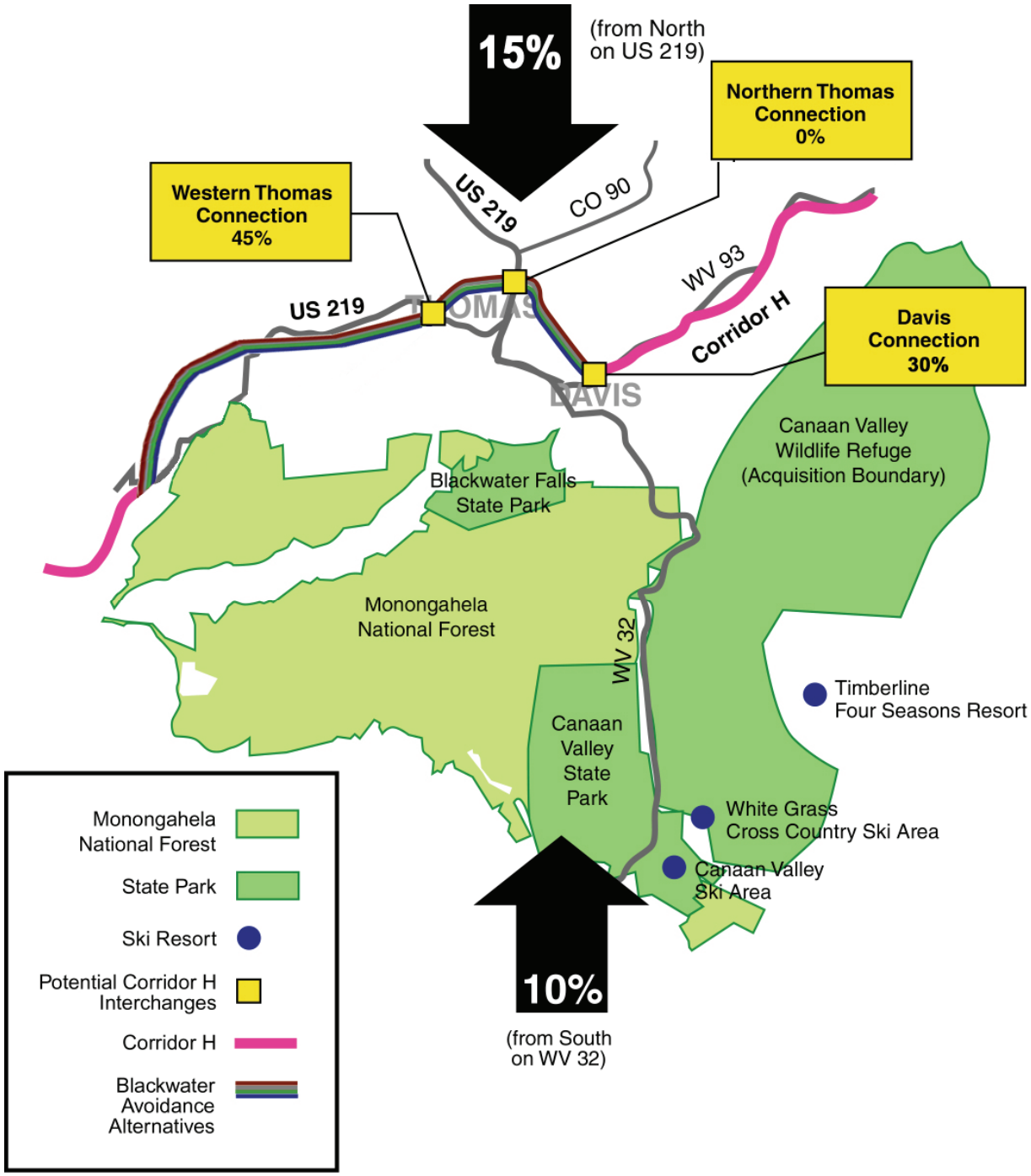

Figure III-3
Tourist Traffic Directional Distribution with Corridor H – Blackwater Avoidance Alternatives

3.2.1.3 Avoidance, Minimization, and Mitigation

All of the alternatives carried forward for detailed analysis would result in reductions in truck traffic in the Thomas business district; therefore, no direct adverse impacts on the local economy are expected and no avoidance, minimization, or mitigation measures are required.

The ROPA/Preferred Alternative, the OPA and Alternative 2 would reduce the potential for tourist traffic to enter the Thomas business district. While this would reduce the potential for tourism benefits through increased tourist traffic, it would also remove a portion of tourist related through-traffic, thereby decreasing congestion in the Thomas business district.

The Blackwater Avoidance Alternatives (1D East and West, 1E, and 1G East and West) would increase the potential for tourist traffic to enter the Thomas business district, while allowing for through traffic to bypass Thomas by continuing on Corridor H. These Blackwater Avoidance Alternatives provide opportunities for additional tourism benefits when compared with the ROPA/Preferred Alternative, the OPA and Alternative 2; however, neither group of alternatives warrants mitigation with regard to tourism-related impacts.

3.2.2 LAND USE

3.2.2.1 Land Use Plans

Western Pocahontas Land Corporation (Western Pocahontas), a coal and timber industry land holding company, is the predominate landowner within the Study Area. The interests of Western Pocahontas would seem to indicate that most of the land in the Study Area will remain undeveloped until the mineral and timber resources are exhausted to the point that their extraction is not profitable. However, Western Pocahontas can conduct property transfers within the area as it deems appropriate.

Tucker County has a Planning Commission but does not have locally-legislated land use controls. Controls exist only to the extent that they are required by state and federal agencies in their various permitting processes.

In 1992, Tucker County adopted a Comprehensive Plan, which states its land use and development plans and objectives. Tucker County intends to update the plan but a timeline for that activity has not been formally determined. (Parsons Advocate, August 2006) The 1992 plan assumes that Corridor H will be constructed along the OPA and states that Corridor H would "greatly enlarge the number of potential industrial sites and enhance their development" (Tucker County Planning Commission, 1992, p. 44). In the Comprehensive Plan, three areas were identified for potential residential, commercial, and industrial development if Corridor H were completed. These areas are: west of Thomas near Benbush, Coketon, and the eastern side of Backbone Mountain near TCHS. The plan also recommends that zoning controls be extended in the vicinity of Corridor H to regulate potential development by preventing incompatible land uses and protecting scenic qualities (Tucker County Planning Commission, 1992, pp. 82 – 88).

Tucker County has also developed two handbooks to guide the development expected to result from Corridor H: *Tucker County Development Handbook* and *Corridor H Design Guidelines*. The handbooks were published in 1997 by Tucker County and the Urban Research and Development Corporation. They provide "guidelines for managing development along the highway corridor and at new highway interchanges [that] will help ensure that growth generated by Corridor H enhances, rather than detracts from, Tucker County's natural and man-made environment" (Tucker County Planning Commission, 1997, p. 2).

Both the City of Thomas and the Town of Davis have economic development plans that identify future land use goals. The City of Thomas' Development Strategy (1998) identifies the need for an interchange with Corridor H and US 219 north of Thomas. It also proposes that the land between Thomas and Davis should be annexed by Thomas to maintain the current greenway corridor and to control new development in that area. Other land use recommendations in the plan include aesthetic improvements to roads and sidewalks, the creation of "gateways" to the community, and the development of a 145-acre city-owned parcel as a park. The Community Design Team of Davis has produced community, economic, and land use goals and strategies (1998). Land use goals include the development of a riverfront park, enacting aesthetic guidelines for historic downtown properties, and enhancing automobile and bicycle transportation throughout the town.

The MNF's proclamation boundary extends eastward, just outside of Thomas and covers approximately 75 percent of the Study Area. The proclamation boundary for the Monongahela National Forest is the legal boundary, as designated by Congress, developed to aid in land management planning from project level to forest level. Land ownership within the proclamation boundary can be highly fragmented; all land within the boundary is not national forest land; some is privately owned. Publicly held lands within the MNF's proclamation boundary are managed under the MNF's *Land and Resource Management Plan Monongahela National Forest* (MNF Plan), an integrated management plan that guides all natural resource management activities within the MNF.

Throughout the planning history of the Corridor H project, the 1986 MNF Plan was in place and its prescriptions and uses have been considered in multiple Corridor H studies. In the December 2002 Parsons-to-Davis SDEIS, the 1986 MNF Plan was used for existing environment and impact analysis. In September 2006 the MNF issued the Final Environmental Impact Statement (FEIS) and Record of Decision (ROD) for the 2006 MNF Plan. The September 2006 MNF Plan describes updated Management Prescription Areas (MPAs) within the MNF. Three MPAs are represented within the Study Area: MPA 3.0, 4.1 and 6.1. The updated MPAs, particularly MPA 3.0 and 6.1 are similar to those described in the 1986 MNF Plan within the Study Area. MPAs are applicable to land held by the MNF only; private property is not subject to the prescriptions. The following synopses present a snap-shot of each MPA represented in the Project Study Area for the purpose of evaluating the Parsons-to-Davis project relative to consistency with the 2006 MNF Plan. The MPAs are shown in Exhibit III-1.

MPA 3.0, Vegetation Diversity, places an emphasis on:

- "Age class diversity and sustainable timber production
- A variety of forest scenery
- Habitat for wildlife species tolerant of disturbance, such as deer, grouse and squirrel
- A primary motorized recreation environment" (2006 MNF Plan, pg III-4)

"The area provides a diversity of habitats for wildlife species, a diverse visual landscape, and considerable human activity resulting from a variety of uses." (2006 MNF Plan, pg III -7). In addition, "A system of roads and trails provides access within the area for public recreation and for administrative and management purposes, including transportation of forest products. Roads are trails provide abundant opportunities for motorized recreation, including driving for pleasure, forest product gathering, hunting, fishing, and wildlife viewing." (2006 MNF Plan, pg. III-7) Approximately 360 acres of MPA 3.0 are located with the Project Study Area.

MPA 4.1, Spruce and Spruce-Hardwood Ecosystem Management, emphasizes:

- "Active and passive restoration of spruce and spruce-hardwood communities
- Research and administrative studies on spruce restoration

- Recover of threatened and endangered species and other species of concern…
- Management of hardwood communities where spruce is a negligible or absent component
- Generally restricted public access and use
- A mix of forest products" (2006 MNF Plan, pg. III-9)

The 2006 MNF Plan also states, "…this prescription area provides habitat for many species, it is primary habitat for the a number of federally listed or Regional Forester's Sensitive Species, including West Virginia northern flying squirrel , Cheat Mountain salamander and northern goshawk." (2006 MNF Plan, pg. III- 11). Further, "A system of roads provides access within the area of administrative and management purposes, including transportation of forest products." (pg. III- 13) and that "Special uses and facilities do not detract from the desired ROS (Recreational Opportunity Setting) settings for the area." (2006 MNF Plan, pg. III-13) Approximately 95 acres of MPA 4.1 are located within the Project Study Area.

MPA 6.1, Wildlife Habitat Emphasis, prescribes:

- "A vegetation management strategy that emphasizes sustainable production of mast and other plant species that benefit wildlife
- Active restoration of pine-oak and oak-hickory communities
- Restricted motorized access and a network of security areas that reduce disturbance to wildlife
- A primarily non-motorized recreational setting
- A mix of forest products" (2006 MNF Plan, pg. III-31)

"A system of roads and trails provides access within the area for administrative and management purposes, including transportation of forest products." (2006 MNF Plan, pg. III-35). Further, "Special uses and facilities such as utility corridors are compatible with minimizing disturbance to wildlife populations and the ROS setting for the area." (2006 MNF, pg. III-35). Approximately 26 acres of MPA 6.1 are located within the Project Study Area.

In regard to MPA 8.0, Special Areas: "The Park Service, Department of the Interior, administers the Natural Landmarks Program. The objective of the program is to assist in the preservation of a variety of significant ecological and geological natural areas which, when considered together, will illustrate the diversity of the country's natural heritage." (Pg. III-47) Big Run Bog (BRB) is a Natural Landmark; its watershed is approximately 660 acres. The 2000 SA prescribes avoidance of the BRB watershed, therefore, the mainline of the project Build Alternatives all avoid the BRB watershed.

This SFEIS acknowledges the relative changes in 2006 MNF Plan from the 1986 MNF Plan. While changes have been made to MPAs within the MNF, these changes do not warrant additional detailed analysis at this time. Further, the MNF Social Impact Assessment (2004) acknowledges the private development trends and increasing recreational demand in the study area. While the MNF proclamation boundary extends to cover most of the Study Area, the majority of the property within the proclamation boundary is privately held and therefore, not subject to MPA management.

Further discussion of the MNF lands is provided in *Section 3.2.7 Recreation*.

3.2.2.2 Consistency with Land Use Plans

All of the Build Alternatives (Blackwater Alternatives and Blackwater Avoidance Alternatives) are generally consistent with the plans of Tucker County, Thomas, and Davis. The No-Build Alternative, however, is not consistent with these local plans because the plans anticipate that Corridor H will be constructed.

The City of Thomas' Development Strategy (1998) states that an interchange with Corridor H and US 219 north of the City is desired. The Blackwater Avoidance Alternatives (1D East and West, 1E, and 1G East and West) provide such a connection. While the ROPA/Preferred Alternative, OPA, Alternative 2, and the No-Build Alternative do not provide this connection, the Thomas Truck Bypass and TCHS connection included in the ROPA/Preferred Alternative provide some of the benefits of a northern connection as identified in the City of Thomas' Development Strategy (1998).

Through continuous coordination with the MNF, it has been determined that construction of any of the Build Alternatives does not conflict with the overall MNF Plan, or with any of the MPA through which it will traverse. Further, the alternatives carried forward for detailed analysis may facilitate some of the expected uses of these areas, specifically mineral exploration, timber harvesting, and recreational uses. Additional discussion of impacts to the MNF lands is provided in *Section 3.2.7 Recreation*. The No-Build Alternative is also consistent with the MNF Plan.

3.2.2.3 Land Use Conversions

Each of the Build Alternatives would require the direct conversion of land to transportation use. Approximate land conversions required by each of the alternatives carried forward for detailed analysis are shown in Table III-5. The No-Build Alternative will not require any land conversion.

Table III-5
Land Converted to Transportation Use (acres)

	1D West	1D East	1E	1G West	1G East	OPA	2	ROPA/Preferred Alternative
Footprint	540	540	514	501	499	352	510	396
MNF MPA[1] 3.0	91	91	95	88	88	107	57	120
MNF MPA[1] 6.1	9	9	9	9	9	7	11	4

[1] Monongahela National Forest Management Prescription Area, based on 2006 MNF Plan.

While MPA 4.1 is located within the Project Study Area, none of the Alternatives Carried Forward for Detailed Study directly impact MPA 4.1, therefore, no land use conversation are shown. Further, MPA 8.0 prescribes 'special use' for Natural Landmarks such as BRB. The mainline of the ROPA/Preferred Alternative avoids the BRB watershed; the relocated of FR 18 (partially located within the BRB watershed) will be developed in consultation with the MNF. While the 2006 MNF Plan presents changes to various MPA areas, these changes are not significant relative to the Parsons-to-Davis project. The Parsons-to-Davis project remains consistent with the MNF plan.

3.2.3 FARMLANDS

3.2.3.1 Existing Conditions

The Farmlands Protection Policy Act requires a farmland impact evaluation for applicable, federally funded projects. Because the Study Area is considered to be rural and Corridor H is not a categorically excluded project, coordination with the National Resource Conservation Service (NRCS) is required. This coordination is accomplished through the completion of a Farmland Conversion Impact Rating (Form AD-1006) for each county impacted (i.e. Tucker County).

3.2.3.2 Potential Impacts

Form AD-1006 was prepared for the OPA and the Blackwater Avoidance Alternatives and reviewed by the NRCS. The form and the NRCS response letter from January 2001 are included in Appendix A. Although the Alternatives have continued to evolve since January 2001, the NRCS response

indicates that the farmland scoring parameters as applied to this region make it highly improbable for an alternative in the area to receive a negative evaluation. Therefore, it is assumed that none of the Build Alternatives would receive a negative evaluation.

3.2.4 SOCIAL ENVIRONMENT

3.2.4.1 Existing Conditions

Communities and Neighborhoods

The western portion of the Study Area is largely undeveloped; however, the eastern portion of the Study Area encompasses the community of Thomas and its neighborhoods of Benbush, William, Railroad Hill, and Cortland Acres. The community and its neighborhoods are not self-sufficient; residents are generally likely to leave the area to meet employment, education, social, commercial, medical, and recreation needs. The Study Area also overlaps with the outskirts of the community of the Town of Davis. The characteristics of these communities and neighborhoods are detailed in Table III-6. Exhibit III-2 shows the communities and neighborhoods in the Study Area.

Table III-6
Communities and Neighborhoods in the Study Area

Community	Neighborhoods	Services and Facilities Available					
		Schools	Library	Law Enforcement	Volunteer Fire Dept. (VFD)	Hospital	Recreation Facilities
Thomas	Benbush Coketon Cortland Acres Railroad Hill William City of Thomas	DTEMS* & TCHS	Mountain Top (Thomas) & Five Rivers (Parsons)	WV State Police and Tucker County Sheriff in Parsons	Thomas	Davis Memorial Hospital in Elkins	Knights of Columbus Community Park, Thomas Community Center, City of Thomas Park (proposed)
Davis	Town of Davis	DTEMS* & TCHS	Mountain Top (Thomas) & Five Rivers (Parsons)	WV State Police and Tucker County Sheriff in Parsons	Davis	Davis Memorial Hospital in Elkins	Knights of Columbus Community Park, Davis Community Center

*Davis–Thomas Elementary and Middle School.

Services, Facilities, and Organizations in the Community

Kindergarten through Grade 12 students of the Study Area are served by the Davis-Thomas Elementary and Middle School (DTEMS) and the TCHS. Total enrollment in public and private schools in Tucker County has declined by 19 percent from 1985 to 2000.

Most (96 percent) of the public school students in Tucker County rely on a fleet of 16 school buses for school transportation. This fleet transports students of all ages, so all busses drop off students at DTEMS on WV 32 first, and then proceed west on US 219 to TCHS. The Study Area is served by parts of five different bus routes (Ramsey, pers. comm., 2000).

A few students, particularly those living in the eastern part of Thomas, elect to walk or bicycle to DTEMS. Therefore, some students are walking or bicycling on WV 32 between Thomas and DTEMS.

Because of its isolated location – on US 219 between Thomas and Hambleton on Backbone Mountain – and safety concerns, students are required to take the school bus or ride with parents to TCHS. In the past, students have not been allowed to drive, bike, or walk to TCHS; however, this issue is revisited periodically by the school board.

While some continuing education classes are available at the TCHS Career Center and the Thomas Education Center, most residents of the Study Area must leave the community to pursue higher education.

The community is served by a small public library, Mountain Top Library in Thomas. Residents of the Study Area may also choose to use the larger Five Rivers Library in Parsons.

The community is served by emergency services dispatched to all of Tucker County through "911" service. Law enforcement is provided by the West Virginia State Police and the Tucker County Sheriff's Office, both located in Parsons. Fire protection is provided by Volunteer Fire Departments (VFDs) in Parsons, Thomas, Davis, and Canaan Valley. The Thomas VFD is located in downtown Thomas and would be the most likely to respond to incidents in the Study Area. Emergency Medical Service (EMS) is provided by the three stations of the Tucker County Emergency Ambulance Authority. The Thomas EMS station is most likely to respond to incidents in the Study Area.

Residents of the community must travel outside the area for health care. The nearest full-service hospital to the Study Area is Garrett County Memorial Hospital in Oakland, Maryland, approximately 23 miles north of the Study Area via US 219. The next nearest hospital, and the one most often selected by patients using EMS (Tucker County Emergency Services internal report) is Davis Memorial Hospital in Elkins, approximately 34 miles west of the Study Area by way of US 219. Davis Memorial Hospital also manages a clinic, Tucker Community Care, in Parsons on WV 72. A veteran's clinic is also available in Parsons.

Cortland Acres is a nursing home located in the Study Area, west of Thomas on US 219. It also operates the adjacent Pineview Apartments that provides assisted living for elderly residents. The Village at Davis, in downtown Davis, is also a senior citizens residential community.

Because the number of persons over age 65 in the community and county is increasingly large, the Tucker County Senior Services program is extensive. There are two centers in the county – one in Parsons and the other in Thomas.

The community has a variety of recreational facilities and programs. Baseball fields are located at the Knights of Columbus Community Park and the Davis Baseball Field. Community centers are located in Thomas and Davis. During the summer, a joint children's recreation program alternates between the Thomas and Davis community centers. Both localities have plans for community parks, the details of which are discussed in *Section 3.2.7 Recreation*.

A number of religious organizations service the community. The locations of identified religious facilities are illustrated in Exhibit III-3.

Finally, the community has a variety of civic organizations, which meet in lodges, churches, community buildings, members' homes, or local restaurants. Various *Parsons Advocate* notices indicate that the current trend in civic organizations has been consolidation because of population and interest decline.

Socio-economic resources in the Study Area are shown on Exhibit III-3.

Community Travel Patterns and Accessibility

Because opportunities are often not available in the community of Thomas, travel outside the community is often required for employment, higher education, shopping, entertainment, and health care. Due to the rural and dispersed nature of development in the region, these facilities are almost exclusively accessed by private vehicles. The only public transportation systems in the community are the school bus system and a shuttle service for senior citizens. Alternative forms of transportation – walking and bicycling – are not generally used due to the terrain, roadway conditions, and the large distances between origins and destinations.

Thomas has identified the need to repair existing sidewalks and to provide bicycle and pedestrian trails to connect community resources, especially DTEMS and the Thomas Community Center/playground (City of Thomas, 1998).

3.2.4.2 Potential Impacts

None of the Build Alternatives carried forward for detailed analysis would separate residents from their community. Instead, they would provide improved safety and efficient transportation access to the necessary services outside the community. Generally, all Build Alternatives provide reasonable and safe access to facilities within the Thomas and Davis areas. The No-Build Alternative would not improve access to services within or outside the local communities.

Compared to one another, the Build Alternatives would have different impacts on community travel patterns because of the differences in their intersections with the existing roadway network. The OPA and Alternative 2 do not offer access points west of WV 32. The ROPA/Preferred Alternative includes a western connection near TCHS. The Blackwater Avoidance Alternatives offer access points to the west of Thomas, to the north of Thomas, as well as at WV 32/WV 93 and would facilitate community travel in numerous and differing ways. Some of the possible scenarios and comparisons of community travel are highlighted below.

The impact of the ROPA/Preferred Alternative on community travel patterns is similar to that of the OPA, Alternative 2 and the Blackwater Avoidance Alternatives. The ROPA/Preferred Alternative offers an access point closer to the TCHS than any of the Blackwater Avoidance Alternatives, and one that has fewer adverse environmental impacts. Because it offers a direct connection to the Tucker County High School entrance, movement to and from the high school would be best accommodated with the ROPA/Preferred Alternative. In order to satisfy or help achieve the project need for direct and safe access to TCHS , a connection would have to be added in the vicinity of the Blackwater Avoidance Alternatives and Alternative 2. A TCHS connection from these other alternatives would result in additional costs and environmental impacts, including requiring large cuts in an area of highly suitable WVNFS habitat. Further, a TCHS connection associated with the Blackwater Avoidance Alternatives or Blackwater Alternative 2 would most likely require additional upgrades to US 219 to improve sight distance, eliminate substandard curves, and generally improve safety since they would approach the school from the east. Thus, in addition to the reduced costs and environmental impacts associated with a TCHS connection from the ROPA, the ROPA/Preferred Alternative also offers the best engineering approach to TCHS.

The movement of visitors and residents to and from the Cortland Acres Nursing Home would be best served by any of the Blackwater Avoidance Alternatives than with the ROPA/Preferred Alternative, OPA or Alternative 2, but specifically Alternatives 1G West and 1G East offer the most convenient access to this facility.

Alternatives 1D West and 1D East offer the most convenient access to the community of Benbush since both the eastbound and westbound access points are closest to this area. Similarly,

Alternative 1E offers the most convenient access to the community of William. Exhibit III-3 can be consulted for conceiving community travel to other points of interest not mentioned in this discussion.

One of the purposes of the Parsons-to-Davis project is to improve the quality of life in the region by improving emergency response times and access to emergency facilities. In part because of its shorter length and less circuitous route, the ROPA, when compared to the other alternatives, results in additional reduced response times between Thomas and Davis and the only full-service hospital (Davis Memorial Hospital in Elkins) serving these communities. It is generally accepted among emergency providers that a reduction in response time of even a few minutes is important and can be crucial. Response time reduction would also apply to other emergency providers (e.g., fire and police).

3.2.5 RELOCATIONS

None of the alternatives will directly displace any business or community facilities. However, Alternatives 1D West and 1G West involve the relocation of the weighing scales and scale house of the Tucker County Landfill. The West Virginia Division of Highways (WVDOH) relocation program ensures that relocated facilities are adequately accommodated with minimal inconvenience and disruption in accordance with current guidelines instituted by the West Virginia Department of Transportation (WVDOT). An expansion of the Tucker County Landfill has been approved; the expansion area is located immediately adjacent to the east of the current cells. The ROPA/Preferred Alternative would not impact the landfill expansion area.

The ROPA/Preferred Alternative, the OPA and Alternative 1E would require one residential relocation. Alternatives 1D East and West, and 1G East and West would not require any residential relocations. Policies and procedures for accommodating relocations are detailed in the 1996 Corridor H FEIS and ROD.

3.2.6 ENVIRONMENTAL JUSTICE

Executive Order 12898 seeks to minimize disproportionate impacts of federal programs on minority and low-income populations. In accordance with this directive, data on the presence of and potential impacts to minority and low-income populations are included below.

3.2.6.1 Existing Conditions

According to the most recent data from the United States Census Bureau (2000 Census data), the population representing the Study Area (Census Tract 9652, block group 3; Census Tract 9653, block group 1; Census Tract 9653, block group 3; and Census Tract 9654, block group 2) had a similar percentage of non-white persons compared to Tucker County as a whole (32 non-white persons or 1.0 percent and 84 non-white persons or 1.1 percent, respectively). Interviews with local officials and field investigations noted that the non-white population is not a concentrated population and is dispersed throughout the Study Area (Schmiedeknecht, 2000 and Snyder, 2000). The Study Area has a much lower ethnic minority (Hispanic) population than Tucker County.

FHWA has defined low-income persons as those whose median household income is at or below the poverty level set by the United States Department of Health and Human Services (FHWA, 1998). In 2000, 17 percent (507 persons) were considered low-income in the Study Area, while 18 percent (1,302 persons) were considered low-income in Tucker County as a whole. Interviews with local officials and field investigations noted that the low-income population is not a concentrated population and is dispersed throughout the Study Area (Schmiedeknecht, 2000 and Snyder, 2000).

3.2.6.2 Potential Impacts

Minority and low-income populations reside in the Study Area, but public involvement conducted indicates that individual minority and low-income families are generally part of the broader community, as opposed to being located in minority or low-income neighborhoods. The environmental justice analysis indicates that these populations would not experience impacts from the No-Build Alternative or Build Alternatives any differently from the rest of the community. Therefore, disproportionately high and adverse impacts to environmental justice populations would not occur with either the No-Build Alternative or any of the Build Alternatives. Specifically, the ROPA/Preferred Alternative would not have disproportionately high and adverse impacts on environmental justice populations.

3.2.6.3 Avoidance, Minimization, and Mitigation

All efforts have been made to avoid and minimize disproportionately high and adverse impacts to environmental justice populations. No mitigation is necessary.

3.2.7 RECREATION

3.2.7.1 Existing Conditions

A detailed description of the existing recreation environment is found in the 1996 Corridor H FEIS *Socioeconomic Technical Report* while updated information concerning the alternatives under consideration in this SFEIS is reported below.

National and State Recreational Lands

There are no National or State Parks in the Study Area. However, approximately 75 percent of the Study Area is covered by the MNF; only publicly-held lands are subject to management in accordance with the applicable MPA. This portion of the MNF is managed by the Cheat Ranger District. While no official estimate has been completed regarding carrying capacity on the Cheat Ranger District, officials note that general trail and road usage is low, and in this region most trails are used between September and October to access hunting areas (Hicks, 2000).

Local Parks

There is one existing local park and one planned local park in the Study Area: The Knights of Columbus Community Park and the proposed City of Thomas Park, respectively. The Knights of Columbus Community Park is not publicly owned, but generally is publicly accessible. Facilities include a baseball field and picnic benches. The proposed City of Thomas Park is a 145-acre parcel and an adjacent 17-acre parcel that the City of Thomas' Development Strategy (1998) identified for development as a park. The Thomas City Council has stated in a March 13, 2001 resolution (Appendix A) that it wishes to jointly develop this property as a park with FHWA and the WVDOH in such a way that both recreational facilities and Corridor H may be accommodated within its boundaries. There are no facilities on this property at the present time.

Private Recreation Lands

The Canaan Valley Institute purchased 3,208 acres along WV 93 north of Davis in 1992. According to the Canaan Valley Institute website (www.canaanvi.org), this tract of land will feature a variety of non-motorized recreation opportunities that will be available to the general public, including nature trails for hiking, biking, equestrian use and skiing; primitive camp sites; a fishing pier; boating/river access; and interpretive nature exhibits (Canaan Valley Institute, 2006). This parcel of land is located just outside the Study Area and will be adjacent to Corridor H just past the

eastern terminus of the Parsons-to-Davis project. There are no potential direct impacts to this site, but it is included due to its proximity to the Study Area.

Recreational Trails

The only major trail within the Study Area is the Allegheny Highlands Trail (Allegheny Trail). In its entirety, the Allegheny Trail is an approximately 330-mile long north-south hiking trail that starts on the Mason-Dixon Line at the Pennsylvania/West Virginia border near Bruceton Mills and makes its way south until it meets the Appalachian Trail on Peters Mountain at the Virginia/West Virginia border. Volunteer workers maintain all sections of the Allegheny Trail, which is marked by 2"x 6" yellow blazes. The MNF maintains other various multi-use trails (hiking and biking) within its proclamation boundary throughout Tucker County. These minor trails also allow for limited motorized access associated with hunting and fire protection. Most of these trails are under-developed (unpaved) and require minimal maintenance.

The Allegheny Trail enters the Study Area in the west on the bed of the historic West Virginia Central and Pittsburg [sic] (WVC&P) Railroad. It then connects with Tucker Co. 27 and proceeds north to WV 32. It follows WV 32 southwest to Tucker Co. 29 and proceeds southeast into Blackwater Falls State Park. Recreational trails are shown on Exhibit III-1.

Portions of the Allegheny Trail system are planned to be "upgraded" in the Study Area (continuing into the Davis-to-Bismarck Project of Corridor H), and are being developed in coordination with the MNF as part of the mitigation commitments associated with Corridor H. These upgrades are also referred to as the Corridor H bike paths In the Study Area, developing the Corridor H bike paths will involve upgrading the historic railroad segment that runs throughout the Blackwater Canyon and the Allegheny Trail within the Study Area. When the proposed bike paths leave the Study Area they continue along the abandoned railroad grade, parallel to WV 93 and end immediately west of Mount Storm (Figure III-4) The current trail system includes a path between Elkins and the border of Parsons. The portions through Parsons itself and between Thomas and Davis are in final design. A trailhead park is planned for downtown Thomas (City of Thomas, 1998). The portion connecting Parsons to Thomas is on hold due to land ownership/land use issues. The MNF currently has a draft environmental impact statement (DEIS) in circulation that evaluates alternatives to address the landownership/land use issues associated with the trail upgrade. According to the MNF website, the Forest Service is currently reviewing comments on the DEIS.

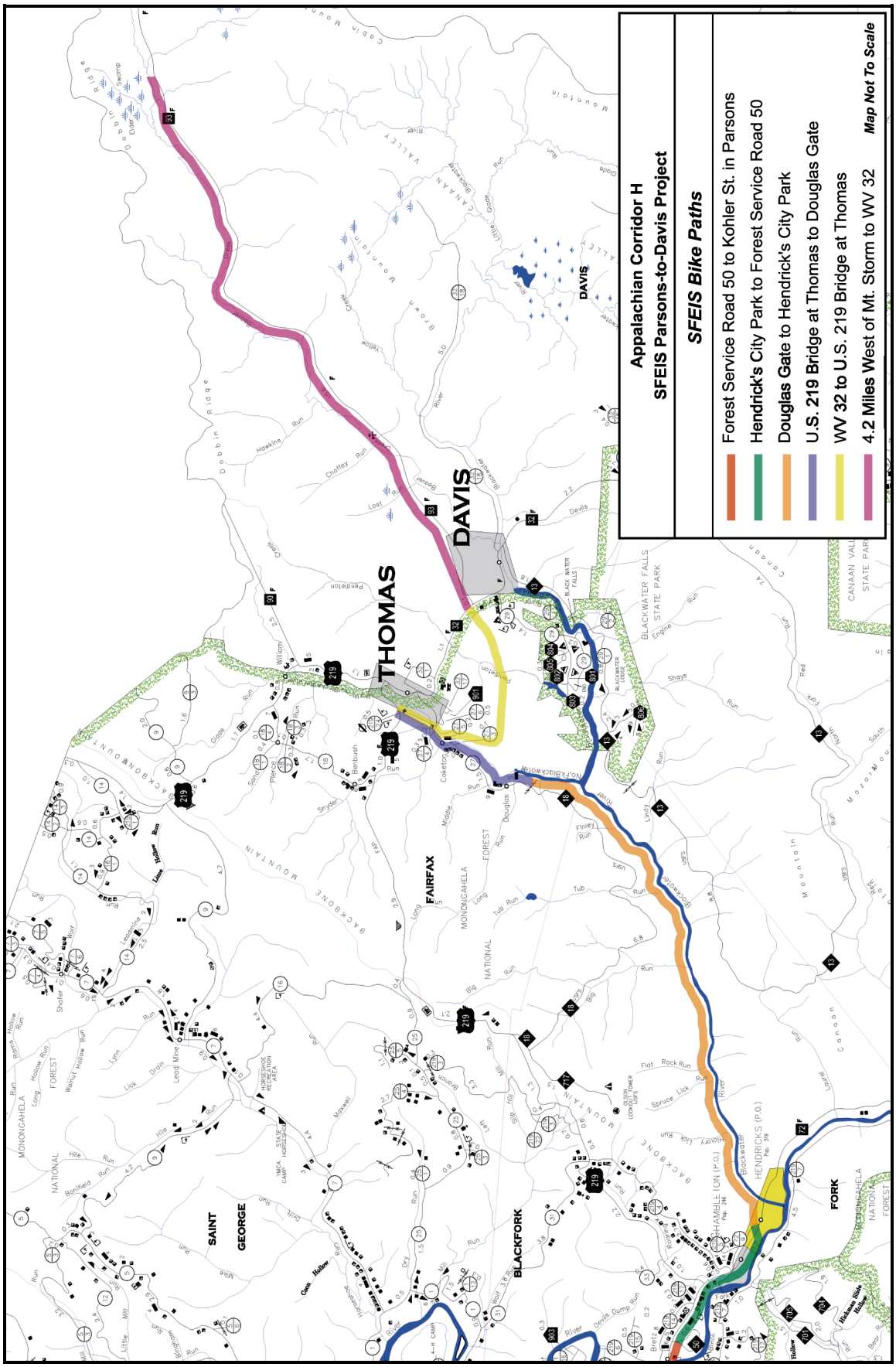

Figure III-4
SFEIS Bike Paths

3.2.7.2 Potential Impacts

National and State Recreational Lands

Since there are no National or State Parks within the Study Area, none of the alternatives considered would impact these types of resources. Within the MNF proclamation boundary, the potential impacts associated with the alternatives considered would be minimal taking into account that the majority of the Study Area is privately owned and therefore, not subject to forest management. However, it is probable that some forest service roads and minor trails within the MNF will be located within or disrupted by the construction limits of any of the Build Alternatives.

Secondary impacts to the MNF would most like occur on a management level. All of the Build Alternatives considered would generally increase access to the MNF, allowing more visitors to use the recreational facilities in the forest. This increased usage may require additional maintenance, law enforcement, resource managers, technicians, information/interpretive specialists, and create a demand for new facilities. Under current budget limitations, manpower is already strained, and the potential recreational demand may only worsen the workload. However, more recreational use may justify an increase in the budget to meet recreational demand (Hicks, 2000). There would be no loss of recreational activity as a result of direct access limitations, and no new roads would be built as a result of increased demand on areas preserved for remote access. Impacts to the visual and noise environments in the MNF are addressed in *Section 3.2.8* and *Section 3.5.5*, respectively.

Local Parks

None of the alternatives considered would directly impact the Knights of Columbus Community Park.

The Blackwater Alternatives (ROPA/Preferred Alternative, the OPA, and Alternative 2) would not impact the proposed City of Thomas Park. However, the Blackwater Avoidance Alternatives would require joint development with the proposed City of Thomas Park. All the Blackwater Avoidance Alternatives (1D East and West, 1E, and 1G East and West) would pass over parts of the proposed park on bridge structure. However, these alternatives would not adversely impact the proposed City of Thomas Park property because these alternatives' planning would be coordinated with the creation of the park. The percentage of the park that would be directly impacted by these alternatives depends on the size of the actual park, which is yet to be determined. However, of the proposed 145-acre area, the Blackwater Avoidance Alternatives would require less than ten acres (or less than seven percent) according to preliminary engineering design.

The relationship between the proposed City of Thomas Park and the Blackwater Avoidance Alternatives is detailed in *Section IV: Section 4(f) and Section 6(f) Analyses*. There will be no Section 4(f) use of local parks, existing or proposed.

Private Recreation Lands

All of the Build Alternatives would increase access to private recreation lands within and immediately adjacent to the Study Area. The No-Build Alternative would not increase access to private recreation lands.

Recreational Trails

All of the alternatives considered would have minimal or no impacts to recreational trails within the Study Area. The Blackwater Avoidance Alternatives do not directly interact with the Allegheny Trail or the proposed Corridor H Bike Paths. The ROPA/Preferred Alternative, the OPA, and Alternative 2 would be on structure over the North Fork of the Blackwater River, and therefore would span the Allegheny Trail and the Corridor H Bike Paths in this location. The Blackwater Alternatives would cross the trail to the east of the Blackwater River where the trail is alongside WV 32. The crossing of the trail would be perpendicular, thereby minimizing potential impact. The No-Build would not

impact recreational trails or other recreational resources within or immediately adjacent to the Study Area. The No-Build would not impact or increase accessibility to recreational trails.

3.2.7.3 Avoidance, Minimization, and Mitigation

All Build Alternatives have been designed to avoid or minimize impacts to recreational resources within the Study Area. While the Blackwater Avoidance Alternatives would impact the proposed City of Thomas Park, the impacts would occur as part of concurrent project development of the park and Corridor H. The Blackwater Alternatives avoid and minimize impacts to the Allegheny Trail and proposed Corridor H Bike Paths (a mitigation element) by bridging much of the Blackwater Canyon. The WVDOH has committed to work cooperatively with the MNF to further minimize and mitigate impacts to forest resources during final engineering design and construction as part of the Memorandum of Understanding (MOU) between FHWA, WVDOT and the MNF executed in June 2003. The MOU is provided in Appendix E.

3.2.8 VISUAL ENVIRONMENT

3.2.8.1 Existing Conditions

The Study Area was examined and evaluated following FHWA's Visual Impact Assessment for Highway Projects (USDOT, 1981), consistent with the methodology used in the 1996 Corridor H FEIS. The Study Area, at the present time, has visual qualities derived from its mountainous terrain covered by secondary growth deciduous forest. The visual qualities of small parts of the Study Area are derived from abandoned, reclaimed, and active surface mining, and even smaller parts of the Study Area reflect limited development. The rural and natural visual qualities of the Study Area are typical for Tucker County and northeastern West Virginia. Therefore, the overall visual quality of the landscape is considered average.

Existing sites that may be sensitive to changes in their visual environment, including the addition of the proposed roadway to their viewshed, are residential areas, areas of recognized beauty, parks and recreation areas, designated historic and cultural areas, water bodies, and public facilities. Existing sensitive sites in the Study Area that could be affected by the proposed project are:

- Benbush residences;
- Cortland Acres and Pineview Apartments;
- Railroad Hill residences;
- William residences;
- Allegheny Trail;
- Knights of Columbus Community Park;
- Rosehill Cemetery;
- Mount Calvary Cemetery;
- DTEMS;
- TCHS; and
- Blackwater Industrial Complex Archaeological and Historic District (Blackwater Industrial Complex).

In addition, consideration was given to the visual relationship between the Build Alternatives and the Tucker County Landfill. Previous strip mining activities have rendered vegetative screening of the landfill less effective on the east side of the landfill than that on the south side.

Visual impacts to sensitive sites were assessed for two viewer groups:

- Those with a view from the proposed project; and
- Those with a view of the proposed project.

3.2.8.2 Potential Impacts

View From The Proposed Project

The 1996 Corridor H FEIS found that the OPA would make available vistas of the area that were previously unavailable to the traveling public. However, the OPA may not provide as intimate a visual experience as do existing roadways, and the feeling of local communities may not be as evident as it is on existing roadways (WVDOT, 1996). Because they are so similar in location, the remaining alternatives carried forward for detailed analysis in this document, including the ROPA/Preferred Alternative, are expected to provide similar visual experiences from the proposed roadway as would the OPA.

Views from the proposed project would be negatively impacted by only the Tucker County Landfill. The East options of Alternatives 1D and 1G will present travelers with a view of the Tucker County Landfill, particularly westbound travelers. The West options of Alternatives 1D and 1G will not include this view, nor will the ROPA/Preferred Alternative, the OPA, Alternative 2, or Alternative 1E, because these alternatives will pass the landfill at an elevation lower than the landfill itself.

View Of The Proposed Project

Of the sensitive sites identified in the Study Area and listed above, the following will have no change in their visual environment because none of the alternatives carried forward for detailed analysis are located in their viewsheds:

- Cortland Acres and Pineview Apartments;
- Railroad Hill residences;
- Mount Calvary Cemetery; and
- TCHS.

The potential impacts of the alternatives carried forward for detailed analysis on the remaining sensitive sites are presented in Table III-7. Where the proposed roadway is not visible from a sensitive site, there is "no impact" on the site. Where the proposed roadway is visible from a sensitive site, the impact on the site was considered. Because the existing visual environment is typical and average, the addition of the roadway to any view from a sensitive site was considered "no adverse impact" on the site. However, detailed analysis of the view from the Blackwater Industrial Complex was conducted for a Criteria of Effects (COE) report for this site which is eligible for listing on the National Register of Historic Places (NRHP).

The COE report documented potential impacts of the ROPA/Preferred Alternative on the Blackwater Industrial Complex. The report was submitted to the consulting parties in March of 2004 and concurrence with its conclusion of "No Adverse Effect" was received from the State Historic Preservation Office (SHPO) and the United States Forest Service (USFS MNF) which manages the property (the Blackwater Industrial Complex lies within the MNF). See *Section 3.4.3.1: Historic Resources* for details regarding this coordination. The viewshed analysis indicates the ROPA/Preferred Alternative, which would cross the Blackwater Industrial Complex in the same location as the OPA or Alternative 2, will be visible from within a portion of the Blackwater Industrial Complex. However, the analysis found that while the bridge of Corridor H would be visible, the visual impact would not alter any of the contributing features of the resource. Therefore, a finding of "no adverse impact" is reported in Table III-7.

Table III-7
Visual Impact on Sensitive Sites in the Study Area

Sensitive site	1D West	1D East	1E	1G West	1G East	ROPA/ Preferred Alternative	OPA	2
Benbush	No Adverse Impact	No Adverse Impact	No Adverse Impact	No Impact	No Impact	No Impact	No Impact	No Impact
William	No Adverse Impact	No Adverse Impact	No Adverse Impact	No Impact	No Impact	No Impact	No Impact	No Impact
Allegheny Trail	No Adverse Impact	No Impact	No Adverse Impact	No Adverse Impact	No Impact	No Adverse Impact	No Adverse Impact	No Adverse Impact
Knights of Columbus Community Park	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact
Rosehill Cemetery	No Impact	No Impact	No Impact	No Adverse Impact	No Adverse Impact	No Impact	No Impact	No Impact
DTEMS	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact
Blackwater Industrial Complex	No Impact	No Impact	No Impact	No Impact	No Impact	No Adverse Impact	No Adverse Impact	No Adverse Impact

3.2.8.3 Avoidance, Minimization, and Mitigation

The visual quality of the views of and from the proposed roadway are important considerations for this project as stated in the 1996 Corridor H FEIS (p. III-88). Therefore, the commitment to design and construct a roadway facility that is visually compatible with the existing visual environment was made in the 1996 Corridor H FEIS (pp. III-89 through III-91). Mitigation could included the following categories: general design, construction, landscaping techniques, scenic overlooks, and site-specific measures to mitigate impacts, as appropriate.

3.2.9 SECONDARY AND CUMULATIVE IMPACTS

Secondary impacts are defined as those that are "caused by an action and are later in time or farther removed in distance but are still reasonably foreseeable" (40 CFR §1508.8). This kind of impact is typically considered an effect indirectly caused or induced by construction of the proposed project. Secondary impacts include the changes in employment, population, and development that may result from a transportation project, as well as the social and environmental impacts of induced land use changes. Cumulative impacts are defined as those impacts that "result from the incremental consequences of an action when added to other past and reasonably foreseeable future actions" (40 CFR §1508.7). Foreseeable actions are generally defined as those for which approved plans exist. Other major on-going and planned projects within the Study Area that could potentially affect development could have a cumulative impact on the environment. These are considered in this analysis to the extent possible.

The development of this secondary and cumulative impact analysis is based on FHWA's Position Paper that addresses this type of analysis for highway projects (FHWA, 1992). In addition,

guidance was provided in the United States Environmental Protection Agency's (USEPA's) *Consideration of Cumulative Impacts in EPA Review of NEPA Documents,* May 1999; the Council on Environmental Quality (CEQ) regulations 40 CFR §§1500–1508; and CEQ's 1997 manual, *Considering Cumulative Effects Under the National Environmental Policy Act*.

In general, the methodology and analysis for secondary and cumulative impact analysis from the 1994 Corridor H Alignment Selection Draft Environmental Impact Statement (ASDEIS) is incorporated by reference and updated as appropriate for this study. The 1994 Corridor H ASDEIS predicted commercial, industrial, residential, and service-oriented development, allocated the raw land conversion, and assessed the environmental impacts. This extensive modeling exercise best represents the cumulative impacts of Corridor H as a whole, including the Parsons-to-Davis section. However, the following discussion is provided to highlight developments that have occurred since 1994 and identify specific features of the Build Alternatives that may affect potential secondary and cumulative impacts as presented in the 1994 Corridor H ASDEIS.

A comparison of secondary and cumulative impacts requires the establishment of the existing No-Build and Build Alternative conditions. The existing condition is detailed throughout *Section III: Existing Environment and Environmental Consequences* of this document and establishes the baseline of resources, ecosystems, and human communities in the year 2000. Demographic and land use analysis indicated that Tucker County's employment and population are stable, and have resulted in a gradual population decline and slight employment growth from 1990 to 2000. It is assumed that the No-Build Alternative will continue these trends; however, this does not imply that the No-Build Alternative does not alter resources, ecosystems, and human communities. Planned and reasonably foreseeable projects and impacts are identified in the No-Build Alternative. The Build Alternatives and their associated induced development impacts have been compared to the No-Build Alternative to determine the incremental effects.

Existing planning documents such as the *Tucker County, West Virginia Comprehensive Plan* (1992), *City of Thomas Development Strategy* (1998), *Davis: Can't Top It!* (1998), the *Corridor H Design Guidelines* (1997), and the *Tucker County Development Handbook* (1997) were consulted to identify planned projects, community goals, and tools for implementation. All of these documents, to some extent, addressed the potential impacts of Corridor H on land use and social and economic environment. In many cases these documents served as tools to address these impacts and provide mitigation of potential impacts. Interviews with local officials were conducted to update the findings of these documents and aid in the assessment of future impacts.

3.2.9.1 Industrial Development

The major planned and approved industrial development sites slated for this region are the build-out of the Mountain Top Industrial Park and the development of the Tucker County Industrial Park near Davis. It is assumed that these industrial parks will develop with or with out Corridor H, but Corridor H would influence the rate of development.

Consistent with the remainder of the Corridor H secondary and cumulative economic analysis, industrial development was assumed to take place in the existing or planned industrial parks. Industrial park growth would be expected to be related to existing businesses and industries in the area or targeted markets (Tucker County Planning Commission, 1992). For Tucker County, this would include wood products manufacturing, light manufacturing, back-office operations, call centers, and tourism (Schmiedeknecht, 2000 and Burns, 2000). Employment opportunities resulting from the build-out of the two industrial parks in the region is likely to have an impact on Study Area residents. Key characteristics of the industrial parks include:

Mountain Top Industrial Park

- Near Mt. Storm and currently accessed by WV 93, in Grant County (east of the Parsons-to-Davis Study Area).
- Referred to as the (new) Grant County Industrial Park in the 1994 Corridor H ASDEIS.
- 182 acres.
- Complete service package (water and sewer) currently available.
- Employment at full build-out is anticipated to be less than the figure projected in the 1994 Corridor H ASDEIS (1,435 employees) (Hiser, 2004).
- Employment is anticipated to include a portion of workers from Tucker County (Hiser, 2004).
- Same level of development regardless of the No-Build or Build Alternatives.

Tucker County Industrial Park

- Located north of Davis and south of WV 93, in Tucker County.
- 82 developable acres (161 total acres at site).
- Complete service package (water and sewer) currently available.
- Grants have provided additional funding that will allow for the extension of additional infrastructure (i.e., power, gas, telecommunications) to the site (Burns, 2004).
- Site is anticipated to be ready for development in 2005 and if funding permits a multi-tenant building will be completed (Burns, 2004).
- In the spring/summer of 2005, the Industrial Development Authority was considering an offer to sell the first parcel of the industrial park and utilities were expected to be completed (Stadelman, 2005b).
- With the No-Build Alternative, potential employers are assumed to be existing local businesses not dependent on heavy truck traffic or shipping (Burns, 2000).
- With the Build Alternatives, potential employers would not be limited by lack of transportation infrastructure due to the development of Corridor H.

In their 2004-2005 annual report, the West Virginia Region VII Planning and Development Council indicated the infrastructure for the Tucker County Industrial Park was nearing completion and noted the formation of the Hardwood Alliance Zone to promote the wood products industry (Region VII report, 2005). The Parsons Advocate reports that Tucker County Development Authority (TCDA) has been approached by prospective tenants in 2006.

Both industrial parks would benefit from the accessibility afforded by Corridor H, although there are no differences between the Build Alternatives in the type or magnitude of these benefits.

The CAG has identified the old airport area as a future site for industrial and residential development. No specific plans have been developed, but the direct access from Corridor H (with the Blackwater Avoidance Alternatives) and the topography of this area make it an obvious choice for future development. As no plans have been developed for this site, it is not assumed to be developed as an industrial park with the No-Build or Build Alternatives. This site is, however, assumed to be a logical location for commercial development with the Blackwater Avoidance Alternatives (discussed further in the following section).

The Tucker County Comprehensive Plan also identified the area adjacent to the TCHS as a potential industrial development area that could occur as a result of Corridor H. The ROPA/Preferred Alternative provides direct access to this site; however, the Tucker County Industrial Park remains

the county's priority site for industrial development (Burns, 2004). Similar to the old airport area, industrial development is not assumed to occur with the No-Build or Build Alternatives, but potential commercial development at this site is discussed in the following section.

The Tucker County Landfill is a source of revenue for Tucker County and currently accepts 50 to 60 truckloads of refuse daily and plans to expand its capacity. Plans for expansion are not dependent on the development of Corridor H, but it would generally benefit equally from all the Build Alternatives due to the potential expansion of its service area. Expansion of the service area would likely increase county landfill revenues in the short term. The West Option (for either 1D or 1G) would have a direct impact on the landfill due to the encroachment upon the facility's scales and scale house. This issue is discussed previously in *Section 3.2.5 Relocations*. The landfill expansion, the development of a new cell, was initiated in August 2006; it is anticipated the new 6.4 acre cell will add seven (7) years of collection to the landfill operation. (Parsons Advocate, August 2006). The ROPA/Preferred Alternative does not impact landfill operations or the newly developed cell.

3.2.9.2 Commercial Development

Under the No-Build Alternative, no new highway-related commercial development is anticipated to occur. Analysis of new commercial development related to the construction of Corridor H was done in the 1994 Corridor H ASDEIS. The analysis used a model from a study of rural interchange development along new interstate highways (Hartgen *et al.*, 1992), and is incorporated here by reference.

An additional tourism component was added to update this analysis based on the estimated origin and travel patterns of tourists destined to the attractions along the WV 32 corridor between Blackwater Falls State Park and Canaan Valley State Park. A description of these assumptions is located in *Section 3.2.1 Economic Environment*.

Traffic Volumes

New commercial development will seek locations with high traffic volumes to maximize exposure to potential customers (Hartgen *et al.*, 1992). With Corridor H in place, the function of the local roads will change, affecting relative traffic routes. While US 219 north of Thomas will retain its importance as a major route to Maryland and I-68, US 219 to the west of Thomas will parallel Corridor H and therefore primarily serve local trips. A greater reduction in traffic is anticipated on US 219 between Parsons and Thomas with Corridor H in place as a result of this dynamic thus reducing potential traffic volumes at the western connection of the ROPA/Preferred Alternative and all of the Blackwater Avoidance Alternatives (1D East and West, 1E, and 1G East and West). Additionally, the ROPA/Preferred Alternative connection at the TCHS will be a primary access route for travelers to the high school.

WV 32 will remain a primary access route for long-distance travelers to the Canaan Valley area. Thus, as a factor in locating new commercial development, WV 32 (the Davis connection) is more favorable due to probable higher traffic levels than the northern and western connections.

Access to Developable Land and Infrastructure

TCHS Connection

The ROPA/Preferred Alternative is the only Build Alternative that provides direct access to TCHS. Over 20 acres of relatively level, developable land with access to the Thomas PSD main-line (water and sewer) are located near TCHS. Additionally, this area has been identified in the

Tucker County Comprehensive Plan as an area that can be developed to serve the commercial needs of traveling motorists.

Western Thomas Connection

Approximately 150 acres of relatively level, developable land is in the immediate vicinity of the western Thomas connection with Alternative 1G. The eastbound on/off ramp for Alternative 1E is also in this vicinity. A portion of the tract located north of US 219 is often referred to as the old airport property. The entire tract is adjacent to existing water and sewer lines, but it is outside the corporate limits of Thomas. Local officials have indicated that they desire this property to develop with residential and industrial uses, and that if development were to occur; they would anticipate annexing this area (Snyder, 2000). Alternative 1D and the westbound on/off ramp for Alternative 1E access smaller developable parcels of land west of Benbush. The ROPA/Preferred Alternative, the OPA and Alternative 2 do not access any land directly west of Thomas.

Northern Thomas Connection

Under all Blackwater Avoidance Alternatives (1D East and West, 1E, and 1G East and West), the northern connection occurs within a half mile and a mile of the existing downtown Thomas business district. Vacant properties in downtown Thomas as well as approximately 30 acres of property, a portion of which is riverfront, could potentially attract commercial development. The entire tract is adjacent to existing water and sewer lines. This parcel is located just north of the City of Thomas' corporate limits, but local officials have indicated that they would attempt to annex this area to benefit from any development (Snyder, 2000). The ROPA/Preferred Alternative, the OPA and Alternative 2 do not access any land north of Thomas.

Davis Connection

The Davis interchange of all the Build Alternatives would directly access over 40 acres of level and developable land fronting WV 93 and WV 32. This development would be bound by the environmental constraints of the Tucker County Landfill to the north and a large wetland complex to the west. A portion of this area, just northwest of WV 93, is within the Town of Davis' corporate limits. Water and sewer infrastructure could be extended from the Tucker County Industrial Park site.

Distance from Connections

Outside the Study Area, the nearest Corridor H connections are approximately 7 miles to the west in Parsons and 16 miles to the east in Bismarck. Within the Study Area, there is a distance of approximately 6 miles between the Davis connection and the TCHS connection along the ROPA/Preferred Alternative. For the Blackwater Avoidance Alternatives, there is approximately one mile between the western and northern Thomas connections and approximately three miles between the northern Thomas and Davis connections. The Study Area appears to be sufficiently distant from the nearest major connections to garner travelers' demand for commercial development at each of the connections associated with the ROPA/Preferred Alternative, OPA, and Alternative 2. However, the Blackwater Avoidance Alternatives' three connections within four to five miles within the Study Area would tend to disperse that demand across all three of the connections, with other factors being equal.

Tourists

Two aspects of tourist travel in the region will influence new commercial development in the Study Area: the distribution of tourist traffic and the potential increase in tourist visitation with Corridor H. These issues are discussed in detail in *Section 3.2.1 Economic Environment*.

Conclusions

Based on the factors detailed above, the following are the developmental stages that can occur on land surrounding new intersections and interchanges on rural highways according to the Hartgen model:

- minimal development;
- residential: single family homes;
- light tourist services: one gas station, one restaurant;
- economically competitive: two to four gas stations, two restaurants, one or two motels;
- economic integration: four or more gas stations, five or more restaurants, three or more motels, no residential, other business;
- heavy tourist: six or more motels, six or more restaurants, three or more gas stations; and
- truck stop.

This analysis was further adjusted based on knowledge of local plans and goals.

The 1994 Corridor H ASDEIS *Secondary and Cumulative Impacts Technical Report* predicted approximately 300 additional commercial jobs in all of Tucker County (including the Parsons area) with the OPA, which would result in the use of approximately 66 acres of land (WVDOT, 1994c). Based on the increased access provided by the Blackwater Avoidance Alternatives and the ROPA/Preferred Alternative for the Parsons-to-Davis Project, this figure is expected to be somewhat higher. The estimates from the original analysis thus present an order-of-magnitude estimate, and based on this estimate, it appears that ample developable acres are available to receive new commercial development. The actual level of development will depend on additional factors, such as the type and level of development desired by the locality, parcel ownership, regional growth, market factors, and infrastructure development.

All connections of the Build Alternatives have the potential to develop to an economically competitive level. As noted above, the economically competitive level, which includes gas stations, restaurants, and motels, is the highest level of development anticipated for any connection associated with this project. Due to the distance between connections, the ROPA/Preferred Alternative would most likely result in light tourist services at both the TCHS connection and the Davis connection. Since the OPA and Alternative 2 have only one connection near Davis, these alternatives are the most likely of the Build Alternative connections to result in commercial development at an economically competitive level. Due to the close proximity of all three interchanges of the Blackwater Avoidance Alternatives, it is unlikely that this region could support the full build-out of all three interchanges. Of the three connections, it is anticipated that the Davis connection has the greatest commercial development potential, which will likely range from light tourist services to economically competitive levels.

3.2.9.3 Residential and related service-oriented growth

The 1994 Corridor H ASDEIS *Secondary and Cumulative Impacts Technical Report* includes analysis of the effects of Corridor H on residential and service-oriented development (WVDOT, 1994c). As new residential development occurs, service-oriented development grows to support it. This

original analysis allocated residential and service-oriented growth within the 100-mile corridor of the project on the basis of several factors, including availability of land, school district characteristics, and accessibility to employment. The original analysis allocated approximately 400 new housing units to Tucker County as a whole. For the current analysis, a closer look at the labor force characteristics and land use within eastern Tucker County was considered relative to the updated information on industrial park development.

Substantial residential development in Tucker County is not anticipated as a result of the jobs created by the Tucker County Industrial Park or the Mountain Top Industrial Park. Given the unemployment rate in Tucker County, a substantial number of new jobs could be created without generating a need for new workers to move into the county, assuming the new jobs fit the skills of the labor pool. Although residential expansion is not anticipated within the time frame of this analysis, localities have identified potential areas for future residential growth. This residential growth will, in part, supplement or replace the aged housing stock that is currently available in Thomas and Davis.

The Tucker County Comprehensive Plan (1992) has identified the expansion of residential areas close to existing towns and specifically, most of the future growth can be accommodated "in the Davis-Thomas area where sufficient and suitable land is available for this growth" (Tucker County Planning Commission, 1992). The CAG has identified the parcels west of Thomas at the site of the old airport and north of Thomas as potential areas for residential growth. The City of Thomas also identified the area west of WV 32/1 (south of the catholic cemetery) as a site for potential residential and commercial development. However, new housing construction was ranked in the bottom third of priority projects identified in a survey completed by the community of Thomas and the Steering Committee (City of Thomas, 1998).

Under the No-Build Alternative, a continued slight population loss is projected (0.28 percent average annual compound loss from 2000 to 2025) (West Virginia University, 2004), and as such, little or no growth in the housing stock would be anticipated to occur. With any of the Build Alternatives, some residential infill would be expected to occur between Thomas and the Davis connection and the Tucker County Industrial Park and possibly on the tracts in the Thomas area identified for potential residential development. While the Tucker County Comprehensive Plan identifies the eastern slope of Backbone Mountain as a potential residential growth area that may result from the development of Corridor H, recent discussions with local representatives, note that this area is less attractive for residential development than the Davis-Thomas area due to its isolation from services and its environmental constraints (Burns, 2004).

3.2.9.4 Other Development

Two large tracts of land have been purchased along WV 93 near Davis. The Vandalia Heritage Foundation purchased approximately 1,120 and the Canaan Valley Institute owns approximately 3,200 acres of land in the area. The type of development anticipated on these parcels is undetermined in one case and is institutional in the other - specifically, private research and conference facilities. These types of development are discussed here to establish whether there is any secondary impact link to Corridor H and to address potential cumulative impacts.

It is undetermined if the tract purchased by the Vandalia Heritage Foundation will be developed for commercial, residential, recreational, preservation, or other uses, or some combination. The Foundation has a "Legacy Project" that is charged with "preserving the 'unbuilt environment' — the rich cultural heritage of northern West Virginia." (Vandalia Heritage Foundation, 2006) However, it is not currently foreseeable whether this property will be part of that program or will be developed for other purposes. The preservation and heritage focus of Vandalia Heritage Foundation projects

suggest that this potential future development is based on a cultural mission within West Virginia and does not appear to be linked to Corridor H. For purposes of cumulative impact analysis, this project is not reasonably foreseeable; the scale, type and timing of the land development has not been defined.

The vast majority of this land that has been purchased by the Canaan Valley Institute is planned for open space, featuring public recreation opportunities and environmental research. A 70,000-square foot research center is planned, including meeting rooms, lab space, and an auditorium (Stadelman, 2005a). While the project may be reasonably foreseeable, the actual acres that will be developed and location of the development is not foreseeable at this time, making an estimation of cumulative environmental impacts impossible. However, the scale of the development concept indicates that wetland and/or water quality permits will be required that, in turn, will require avoidance, minimization, and mitigation of impacts to sensitive resources. An environmental impact statement is being prepared for the site. In addition, the research mission of the Canaan Valley Institute and information on its website indicate that wetland rehabilitation projects will be features of on-site environmental research regardless of any environmental impacts from development (Canaan Valley Institute, 2006). The project is currently on-hold due to taxation issues associated with the property (Parsons Advocate, April 2006). Further, according to CVI's website (www.canaanvi.org, accessed January 10, 2007), "Due to unforeseen circumstances, Canaan Valley Institute's headquarters/educational building construction project has been placed on hold until further notice."

3.2.9.5 Cumulative Economic Impacts

In 1998, Wilbur Smith Associates completed a study entitled *Appalachian Development Highways Economic Impact Studies*, which measures the extent to which the completed portions of the Appalachian Development Highway System (ADHS) have contributed to the economic well-being of Appalachia. As a designated Appalachian Development Highway, Corridor H is anticipated to result in similar economic benefits, although on a smaller scale, as those identified in that study. Unlike the industrial, commercial, and tourist-based growth anticipated as a result of any of the Build Alternatives, travel time efficiencies resulting from Corridor H would correlate into many secondary economic benefits for the region. Travel time efficiencies may be in the form of reduced travel time, reduced vehicle operating costs, and a reduced number of accidents. The Wilbur Smith Associates study assumed that the "improved travel efficiency along the ADHS corridors ultimately leads to an increase in economic production, job opportunities, wages, population, and travel benefits to the people and communities it serves" (Wilbur Smith Associates, 1998). While these specific benefits have been quantified to the extent possible throughout this document for the Parsons-to-Davis Project, the Wilbur Smith Associates study used a regional economic model (the REMI Model) to quantify the economic opportunity created for the entire Appalachia region. Following are some of the relevant study conclusions for the twelve ADHS corridors in the Appalachia region:

- ADHS has created jobs – By 1995 a net increase of 16,000 jobs are estimated to have been created that would not have existed without the competed portions of the ADHS. By 2015, the net increase will be a total of 42,000 jobs.
- ADHS has led to increased production – By 1995 the net increase in value added was $1 billion. In 2015 the net increase in value added is projected to be $6.9 billion.
- Improved road conditions and access resulting from greater efficiency has been valued at $4.89 billion over the 1965-2025 period.

- Over the life cycle of the ADHS, for each $1 invested, the return is $1.18 in efficiency benefits, and $1.32 in economic impact benefits.
- Individual corridor efficiency benefit returns on investment range from 5.44 percent per year to 10.06 percent per year.

3.3 NATURAL ENVIRONMENT

3.3.1 FLOODPLAINS

Floodplains are those areas adjacent to streams and rivers that are subject to periodic inundation. The width of the floodplain can vary from a few feet to many miles. Floodplain and floodway maps have been developed by the Federal Emergency Management Agency (FEMA) as part of its National Flood Insurance Program (NFIP). A detailed discussion of the NFIP is included in the 1996 Corridor H FEIS (Section III.N), and incorporated by reference into this document.

Floodplains serve a variety of abiotic and biotic functions. They moderate the flow of floods and serve as storage areas for floodwater, provide water quality maintenance, act as areas for ground water recharge, and serve as habitat for plants and animals.

3.3.1.1 Methodology

The methodology used for the floodplain analysis was presented in the 1996 Corridor H FEIS. The assessment methodology is based on the requirements provided in Executive Order 11988, *Floodplain Management*; 23 CFR part 650, *Location of Hydraulic Design of Encroachments on Floodplains*, and USDOT 5650.2, *Floodplain Management and Protection*. Study Area mapping, with floodplains and floodways highlighted, is presented in Exhibit III-4.

3.3.1.2 Existing Environment

The North Fork of the Blackwater River above Thomas and portions of Pendleton Creek have relatively wide floodplains on flat valley floors. Due to the flat, wide, and approximately level nature of these floodplains, flood-flow velocities and depth outside the mainstream channel are relatively low.

Over the last 20 years, there have been several significant flooding events in the region and the local watershed. Some of these events have been catastrophic. In 1996, flooding events in local sub-watersheds twice peaked at or above 100-year flood return levels. Because of a long flooding history and continued high risk, Tucker County has joined with Randolph County as partners in FEMA's Project Impact. Through this program, communities learn to protect themselves from the devastating effects of natural disasters by taking actions that dramatically reduce disruption and loss.

3.3.1.3 Potential Impacts

As described in the 1996 Corridor H FEIS, the No-Build Alternative would have no effect on floodplains in the Study Area.

Table III-8 presents the 100-year floodplain encroachment area for each of the Build Alternatives carried forward for detailed analysis. The Blackwater Avoidance Alternatives (1D West and East, 1E, 1G West and East) do not require floodplain encroachments. The Blackwater Alternatives (ROPA/Preferred Alternative, OPA, and 2) will require floodplain encroachments associated with the Pendleton Creek crossing. Final engineering design will determine bridge pier placement in accordance with floodplain regulations and pertinent Section 106 commitments. There is no regulatory floodway designated for Pendleton Creek; therefore, no floodway impacts are associated with this stream crossing.

Table III-8
Floodplain/Floodway Impacts (in acres)

Floodplain/Floodway	1D West	1D East	1E	1G West	1G East	OPA	2	ROPA/Preferred Alternative
100-year Floodplain	0.0	0.0	0.0	0.0	0.0	3.2	2.5	3.2
Regulatory Floodway	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

All Blackwater Alternatives, including the ROPA/Preferred Alternative, will bridge the regulatory floodway associated with the North Fork of the Blackwater River. The ROPA/Preferred Alternative may require the placement of bridge piers within the 100-year floodplain of this river. Final engineering design will determine bridge pier placement in accordance with floodplain regulations, and Section 106 commitments, as appropriate.

Based on coordination with the local Project Impact partnership, none of the alternatives carried forward for detailed analysis conflict with the Project Impact initiative in Randolph and/or Tucker County.

3.3.2 VEGETATION & WILDLIFE

3.3.2.1 Methodology

The existing environment and impacts to vegetation and wildlife for the project were detailed in the 1996 Corridor H FEIS, and are incorporated by reference into this document.

The following sections provide an updated vegetation and wildlife habitat assessment for the alternatives carried forward for detailed analysis in this SFEIS. This assessment follows the guidance of the FHWA Technical Advisory T 6640.8A (FHWA, 1987) and the USEPA's *Evaluation of Ecological Impacts from Highway Developments* (Southerland, 1993).

3.3.2.2 Wildlife Habitat

Methodology

Wildlife habitat values within the Study Area were assessed using the United States Fish and Wildlife Service (USFWS) Habitat Evaluation Procedure (HEP) (USFWS, 1981). HEP was utilized to rate the quality and quantity of wildlife habitat in order to quantify the impacts that result from land and water development projects. HEP is based on the fundamental assumption that the quantity and quality of a habitat can be numerically documented and reasonably predicted for future conditions. Generally, HEP provides information to evaluate the relative value of different habitat types before, during and after highway construction for each of the proposed alternatives. A detailed discussion of the HEP methodology, species selection, and data collection requirements is included in the 1994 Corridor H ASDEIS *Vegetation and Wildlife Technical Report* and the 1996 Corridor H FEIS.

Of the 119 available wildlife species models, 18 evaluation species were selected to evaluate 11 USFWS habitat types within the Study Area (Table III-9). Due to the time and expense involved in model development and field-testing, only those wildlife models previously developed by the USFWS were considered for this assessment. In conjunction with HEP, the Habitat Suitability Index (HSI) program developed a list of habitat variables for each species and generated a data collection form for each cover type.

Table III-9
Land Cover Type Use By Evaluation Species

USFWS Land Cover Type	Evaluation Species																
	American Woodcock	Barred Owl	Black-capped Chickadee	Brown Thrasher	Downy Woodpecker	Eastern Cottontail	Eastern Meadowlark	Eastern Wild Turkey	Gray Squirrel	Hairy Woodpecker	Mink	Muskrat	Pileated Woodpecker	Pine Warbler	Red-winged Blackbird	Veery	White-tailed Deer	Yellow Warbler
AC- Cropland	.	.	.	.	.	.	.	●	.	.	.	.	.	.	.	.	●	.
AO - Orchards	.	.	.	●	.	●	.	.	.	.	.	.	.	.	.	.	●	.
AP- Pasture or Hayland	.	.	.	●	.	●	●	●	.	.	.	.	.	.	.	.	●	.
UF - Forbland	.	.	.	●	.	●	●	●	.	.	.	.	.	.	.	.	●	.
UFOD- Deciduous Forest	●	●	●	●	●	●	.	●	●	●	.	.	●	●	.	.	●	.
UFOE- Evergreen Forest	●	●	●	●	●	●	.	●	.	.	.	.	●	●	.	.	●	.
UG - Grasslands	.	.	.	●	.	●	●	●	.	.	.	.	.	.	.	.	●	.
USHD – Deciduous Shrublands	.	.	.	●	.	●	.	●	.	.	.	.	.	.	.	.	●	●
PEM – Palustrine Emergent Wetland	.	.	.	.	.	.	.	.	.	.	.	●	.	.	●	.	●	.
PFO – Palustrine Forested Wetland	●	●	●	.	●	.	.	●	●	●	●	.	●	.	.	●	●	.
PSS – Palustrine Scrub-Shrub Wetland	.	.	.	.	.	.	.	.	.	.	●	●	.	.	.	●	●	●

Existing Conditions

The Study Area is dominated by mixed deciduous forest and evergreen forests that are intermixed with wetlands, areas that have been disturbed by surface coal mining activities, and small areas of mountaintop pasture land. The forest community within the Study Area consists of northern hardwood forest species including sugar maple (*Acer saccharum*), red maple (*Acer rubrum*), black cherry (*Prunus serotina*), American beech (*Fagus grandifolia*), yellow birch (*Betula alleghaniensis*), hemlock (*Tsuga canadensis*) and red spruce (*Picea rubens*). Northern hardwood forests or upland forests generally occur at elevations above 3,000 feet, but can extend down slope as low as 2,460 feet in rich moist loamy soils (Stephenson, 1993).

Table III-10 provides the land cover types within the construction limits of the Build Alternatives, based on the USFWS cover type classification system (USFWS, 1981).

Table III-10
USFWS Land Cover by Build Alternative (in acres)

USFWS Land Cover Type	1D West	1D East	1E	1G West	1G East	OPA	2	ROPA/Preferred Alternative
AC- Cropland	0.0	0.2	0.0	0.0	0.2	0.0	0.0	0.2
AO - Orchards	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AP- Pasture or Hayland	4.6	10.0	7.7	3.1	8.5	15.8	14.8	16.7
UF - Forbland	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
UFOD- Deciduous Forest	393.0	391.0	367.0	352	350.0	219.3	321.3	250.0
UFOE- Evergreen Forest	106.0	97.0	112.0	108.0	100.0	117.7	130.1	115.2
UG - Grasslands	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
USHD – Deciduous Shrublands	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PEM – Palustrine Emergent Wetland	1.0	1.0	2.0	0.5	0.3	3.7	4.2	5.3
PFO – Palustrine Forested Wetland	0.1	0	3.5	0.1	0.1	0.6	0	1.1
PSS – Palustrine Scrub-Shrub Wetland	0.1	0.7	0.3	0.1	0.7	1.1	1.0	0.9

Potential Impacts

As described in the 1996 Corridor H FEIS, the No-Build Alternative would not result in the loss of vegetated area; therefore, no Habitat Units (HUs) would be lost, and the No-Build Alternative would have no effect on vegetation and wildlife in the Study Area.

HUs were calculated within the construction limits of each Build Alternative. During highway construction, and for five years following completion, it was assumed that no habitat would be available within highway construction limits. Construction activities would have either removed existing vegetation or would have resulted in disturbances sufficient to render the remaining habitat unsuitable to support viable wildlife populations. Bridged areas were also included as wildlife habitat impacts even though bridges would not result in the same level of impact when compared to culvert crossings and cut and fill slopes.

After five years, portions of all the Build Alternatives would revegetate and provide some level of habitat previously lost due to construction. Based on past highway projects, the revegetated portions would be composed of 70 percent grassland, 10 percent shrub cover, and 5 percent tree cover. Therefore, wildlife species adapted to herbaceous and shrub cover will use the habitat within the construction limits (Oetting and Cassel, 1971; Adams and Geis, 1982; Michael, 1975; Getz et al., 1978; Burke and Sherburne, 1982; Michael and Kosten, 1981).

Table III-11 provides the comparison of baseline HUs within the construction limits of the Build Alternatives, based on the identified evaluation species. The Blackwater Avoidance Alternatives (1D West and East, 1E, 1G West and East) would result in the greatest amount of HU loss. The Blackwater Alternatives (ROPA/Preferred Alternative, OPA, and 2) would result in the least amount of HU loss with the OPA resulting in the least HU loss of all the Build Alternatives. When compared to the OPA, the ROPA/Preferred Alternative would result in an additional loss of 301 HUs. The additional HU loss is attributed to the addition of the TCHS connection to the ROPA/Preferred Alternative.

Table III-11
Comparison of Baseline Habitat Units (HUs) by Evaluation Species (in acres)

Evaluation Species	Build Alternatives							
	1D West	1D East	1E	1G West	1G East	OPA	2	ROPA/ Preferred Alternative
American Woodcock	299	293	290	276	270	203	271	220
Barred Owl	329	322	318	304	297	223	298	242
Black-capped Chickadee	499	488	483	460	450	338	451	366
Brown Thrasher	66	65	63	60	60	46	61	50
Downy Woodpecker	250	244	241	230	225	169	226	183
Eastern Cottontail	373	369	360	343	339	261	345	283
Eastern Meadowlark	2	5	4	2	4	8	7	8
Eastern Wild Turkey	277	274	270	255	252	194	256	211
Gray Squirrel	204	203	193	183	182	114	167	131
Hairy Woodpecker	287	286	270	257	256	161	235	183
Mink	0	0	3	0	1	1	1	1
Muskrat	0	0	0	0	0	1	1	1
Pileated Woodpecker	190	185	183	175	171	128	172	139
Pine Warbler	0	0	0	0	0	0	0	0
Red-winged Blackbird	5	5	5	5	5	0	5	0
Veery	0	0	2	0	0	1	0	1
White-tailed Deer	490	485	478	450	446	248	457	378
Yellow Warbler	0	0	0	0	0	0	0	0
Total	3,271	3,224	3,163	3,000	2,958	2,096	2,953	2,397

Avoidance, Minimization, and Mitigation Measures

Where practicable, Build Alternatives were developed to avoid and/or minimize known areas of unique wildlife habitat (i.e. caves, suitable and highly suitable West Virginia northern flying squirrel (WVNFS) habitat, red spruce forest, sensitive watersheds, and wetlands) where federally listed threatened and endangered species have been documented. Specific measures to mitigate for wildlife habitat impacts are described in detail in the 1996 Corridor H FEIS, Volume III *Mitigation Document,* and the Biological Opinion.

A HU ledger has been created to monitor and track WVDOH's effort to mitigate for upland habitat loss. WVDOH has committed to spend $1.8 million to purchase and preserve unique habitat. USFWS and WVDNR accepted this commitment (see USFWS letter dated March 12, 2002, Appendix A). WVDOH determined and the agencies agreed that the 1996 Corridor H FEIS Preferred Alternative would impact 6,145 HUs (calculated using the area of impact in hectares).

In April 2004, a summary of Corridor H mitigation activities was presented to the following resource agencies at a meeting held at Stonewall Jackson Lake State Park: USACE Pittsburgh District; USEPA; USFWS; WVDNR; WVDEP. Through mitigation measures such as minimization of clearing and grubbing, the purchase of upland area surrounding the Leading Creek mitigation wetland, the purchase of uneconomical land remnants for preservation along Corridor H, and the purchase of the property in the Cheat River Canyon to preserve habitat for federally threatened and endangered species, 4,592 HUs have been preserved or recovered. WVDOH is committed to purchase additional unique habitat to preserve or recover the remaining 1,553 HU to balance the HU ledger. Consistent with Volume III of the 1996 Corridor H FEIS, mitigation coordination will continue through the project development process; mitigation compensation ledgers will be updated and revised, as appropriate.

Secondary impacts to wildlife are categorized as either development-related or highway-related impacts. Development-related impacts on wildlife include induced development for industrial, commercial, residential, and service-oriented growth. Additional habitat may be lost due to predicted development. Predicted development is an aggregate of intersection/interchange, residential and service oriented development. Potential secondary and cumulative impacts resulting from the construction of Corridor H are discussed in detail in the 1994 Corridor H ASDEIS *Secondary and Cumulative Impacts Technical Report* which is incorporated by reference into this document.

3.3.2.3 Forest Fragmentation & Biodiversity

Methodology

Large forested tracts are important habitat for area sensitive species and species requiring large territories. These forested areas contain other microhabitats such as streams and associated riparian corridors that are used by a wide variety of wildlife species for feeding and/or breeding purposes. During the preparation of the 1996 Corridor H FEIS, forest interior neotropical migrant bird species were chosen to represent area-sensitive and landscape-dependent (sensitive to changing land use patterns) wildlife species to assess the possible effects that forest fragmentation may have on these species and biological communities.

An extensive literature review and detailed information on the methodology used for the evaluation of forest fragmentation on landscape dependent species, represented by neotropical migrant birds species, is presented in the 1994 Corridor H ASDEIS *Vegetation and Wildlife Technical Report* and the 1996 Corridor H FEIS, and is incorporated into this document by reference.

Breeding bird survey (BBS) data were reviewed to determine the present population trends of four neotropical migrant bird species within West Virginia: wood thrush (*Hylocichila mustelina*), red-eyed vireo (*Vireo olivaceus*), ovenbird (*Seiurus aurocapillus*), and veery (*Catharus fuscescens*). Because the brown-headed cowbird (*Molothrus ater*), a species that exploits the forest edge, is implicated as one factor in the decline of neotropical migrants (Brittingham and Temple, 1983; Donovan *et al.*, 1995; Robinson *et al.*, 1995; Trine, 1998), population trends of this species were also reviewed. Based upon the existing land cover data within the Study Area, a GIS analysis was used to determine the total area of forest habitat within each of the alternatives carried forward for detailed analysis before and immediately after highway construction.

Existing Environment

Within the Study Area there are approximately 7,570 acres of upland forest which accounts for approximately 88 percent of the 8,600-acre Study Area. The topography and hydrology of Study Area has been altered through historical and present surface mining and mining related activities (e.g., railroads, access roads, waste disposal), and some portions of the forested area have undergone timbering and selective cutting. This physical alteration of existing land use and changing land use patterns over time has already led to habitat simplification and fragmentation within the Study Area. Despite this land use pattern, there are large contiguous tracts of upland forest that extend beyond the limits of the Study Area.

BBS data and minimum breeding area requirements within the Study Area are summarized in Table III-12. Within West Virginia, the population trends showed an increase for two of the four indicator species, red-eyed vireo and the ovenbird, with varying minimum breeding area requirements. These population increases suggest that there has been movement of these bird species from sub-optimal to more optimal habitat, likely due to increasing attention to land management practices in West Virginia.

The wood thrush and brown-headed cowbird showed a decrease in population over the investigated period (1980-1998), with trend values of -0.82 and -4.65 respectively. These negative values may reflect the overall land use patterns within the state, and the species ability to exploit these patterns. Brown-headed cowbirds are able to utilize open areas of traditional foraging habitat (agriculture/pasture) as a base from which to parasitize forest dwelling species. Of the 1,464,418 acres of land in West Virginia, 80 percent of the land cover is forested, while agriculture/pasture makes up 18 percent. The trend of increasing forest cover in West Virginia likely accounts for the apparent declining trend in brown-headed cowbird populations within the state.

Table III-12
Minimum Breeding Area Requirements & Breeding Bird Survey Data for Neotropical Migrant Birds and the Brown-Headed Cowbird[1]

Common Name	Scientific Name	Minimum Breeding Area (in acres)[2]	Population Trends 1980 - 1998[3]
wood thrush	*Hylocichila mustelina*	2.5	- 0.82
red-eyed vireo	*Vireo olivaceus*	6	+ 0.80
ovenbird	*Seiurus aurocapillus*	15	+ 3.68
veery	*Catharus fuscescens*	49	No data
brown-headed cowbird	*Molothrus ater*	No data	- 4.65

[1] The brown-headed cowbird is a known parasite of neotropical migrant bird species.
[2] Sauer et al., 2000
[3] Patuxent Bird Identification and Breeding Bird Survey results (average percent annual change).

Potential Impacts

As described in the 1996 Corridor H FEIS, the No-Build Alternative would not result in the loss of forested area; therefore, the No-Build Alternative would not result in any further forest fragmentation and would have no effect on the existing biodiversity within the Study Area.

Eighty-eight (88) percent of the Study Area is composed of large contiguous areas of upland forest, which have been subject to timbering and surface coal mining activities. The GIS digital land use and land cover database was utilized to determine the total amount of forest cover within the Study Area and within the construction limits of each Build Alternative. A comparison of forest cover within the construction limits of each Build Alternative, and the percentage of the total forest cover with the Study Area that will be converted to highway use for each Build Alternative is presented in Table III-13.

Table III-13
Changes in Forest Cover due to the Construction of Each Build Alternative

Alternative	Total Area of Impact (in acres)	Total Area of Forest Cover Impacts (in acres)	Percent Forest within Alternative	Percent of Study Area Forest Cover Impacted[1]
1D West	540	499	92.4	6.3
1D East	538	488	90.7	6.1
1E	514	479	93.2	6.0
1G West	501	460	91.8	5.8
1G East	499	450	90.2	5.6
OPA	350	238	68.0	3.1
2	508	452	89.0	6.0
ROPA/Preferred Alternative	396	224	56.6	3.0

[1]Upland forest cover comprises 7,570 acres (88%) of the Study Area.

The Blackwater Avoidance Alternatives (1D West, 1D East, 1E, 1G West, and 1G East) and Blackwater Alternative 2 would result in the greatest impacts to forest cover. The ROPA/Preferred Alternative and OPA would result in the least amount of forest cover impacts. The difference in forest cover impacts among the alternatives carried forward for detailed analysis is primarily due to their various lengths. The ROPA/Preferred Alternative will result in a 3 percent loss in existing forest cover which represents a very small percentage of regional forest lands.

Breeding bird survey data suggests a positive trend toward habitat availability and usage by neotropical migrant bird species resulting from better land management practices in West Virginia. As shown in Table III-13 the ROPA/Preferred Alternative would impact 3 percent of the total forest cover within the Study Area. It is unlikely that construction of the ROPA/Preferred Alternative will impact the positive trend of habitat availability and usage for neotropical migrant bird species. Furthermore, large forest patches (greater than 1,235 acres) would remain to accommodate species with large territory or "home-range" requirements.

Edge Effects

The creation of edges due to highway construction can lead to the distribution of non-native plant species and noxious weeds if not controlled or mitigated after construction. Additionally, long grassy right-of-way (ROW) corridors can facilitate the distribution of non-forest animal species (e.g., meadow vole, brown-headed cowbird). Mitigation measures to minimize the spread of non-native plant species and noxious weed species are detailed in the 1996 Corridor H FEIS, Volume III *Mitigation Document*.

Avoidance, Minimization, and Mitigation Measures

Mitigation measures presented in the 1996 Corridor H FEIS, Volume III *Mitigation Document* outline control measures to minimize the spread of non-native plant species and noxious weed species. The *Mitigation Document* also contains commitments for the use of native vegetation to rapidly re-vegetate areas disturbed during construction (WVDOT, 1996). Where practicable, WVDOH, in conjunction with the natural resource agencies, will attempt to limit the area of clearing and grubbing operations. Similarly, the amount of ROW maintained in short grasses would be limited to control the population densities of grassland and pioneer species of fauna.

3.3.2.4 Wildlife Mortality

Methodology

A thorough discussion of wildlife mortality on reptiles, amphibians, birds, and mammals as a result of highway construction and operation is presented in the 1994 Corridor H ASDEIS *Vegetation and Wildlife Technical Report* (WVDOH, 1994e) and 1996 Corridor H FEIS, and is incorporated by reference into this document.

Existing Environment

As discussed in Sections 3.3.2.2 and 3.3.2.3, 88 percent of the land cover type within the Study Area is upland forest that is intermixed with areas disturbed by surface mining activities, wetlands, and a few small areas of pastureland. Three major routes, US 219, WV 32, and WV 93 are located within the Study Area. US 219 is the only direct route between Parsons and Davis, WV 32 connects the towns of Thomas and Davis, and WV 93 continues east of Davis to Mount Storm. Wildlife mortality resulting from collisions with motor vehicles traveling these routes is present, but no specific studies have been conducted along these routes to determine the animal species affected or to quantify the number of animals killed. However, research of highway related wildlife mortality indicates that it is density dependent, and that the species killed in greatest numbers are those attracted to grassy and early successional ROW habitat with high population densities, such as edge associated birds and small/medium sized mammals (Adams and Geis, 1981 and Michael, 1975).

One federally endangered species, the West Virginia northern flying squirrel (WVNFS), is found within the Study Area. One population has been identified in Big Run, and a second in Middle Run (Exhibit III-5). Approximately 4,909 acres of WVNFS suitable habitat and 817 acres of highly suitable WVNFS habitat are located within the Study Area. The highly suitable WVNFS habitat is located at the western portion of the project area along the ridge of Backbone Mountain (Exhibit III-5).

Potential Impacts

The construction of any of the Build Alternatives carried forward for detailed analysis would convert existing land covers to early successional grassy or shrubby vegetation commonly associated with highway ROWs. Potential highway-wildlife impacts would likely follow those observed on the Appalachian Corridor E (I-68) study (Michael, 1975), which is similar to the proposed project. The results of the I-68 study indicate that highway construction and operation would not adversely affect the majority of bird and mammal species, including game species that exist within the project watershed. Wildlife mortality would be density dependent, and the species killed in the greatest numbers would be those attracted to ROW habitat with high population densities (Michael, 1975). Wildlife mortality would continue to occur on existing roadways with the No-Build Alternative, and impacts would be similar to those found by Adams and Geis (1981) for county roads.

All of the Build Alternatives would cross through highly suitable and suitable WVNFS habitat, and would have the potential to interdict dispersing WVNFS. However, because of its geographic and topographic location, the ROPA/Preferred Alternative would not require long and high cut and fills and as a result would have the smallest highway "footprint" of all the Build Alternatives. A more detailed discussion of potential WVNFS mortality associated with the Build Alternatives is presented in the Biological Opinion.

Avoidance, Minimization, and Mitigation Measures

Avoidance, minimization, and mitigation measures for potential interdiction of WVNFS dispersants that may result from the construction of the ROPA/Preferred Alternative are detailed in *Section 3.3.3.3* and in the Biological Opinion.

3.3.3 THREATENED & ENDANGERED SPECIES

The Endangered Species Act (ESA) of 1973 (16 USC 1531-1543 et seq.) protects threatened and endangered species and designated Critical Habitat of such species occurring both in the United States and abroad. Section 7 of the ESA requires that federal agencies such as FHWA ensure that any federal action authorized, funded, or carried out is not likely to jeopardize the continued existence of any threatened or endangered species or result in the destruction or adverse modification of Critical Habitat of any such species. Critical Habitat, as defined in the ESA (16 USC 402.03 (5)(A)), is the specific location within the geographic area occupied by the species essential to the conservation of the species, which may require special management considerations or protection. Critical Habitat does not include the entire geographic area that can be occupied by the threatened or endangered species (16 USC 402.03 (5)(C)).

The USFWS is the regulatory agency responsible for administering ESA compliance. In a letter dated July 14, 2000 (Appendix A), the USFWS identified four threatened or endangered species that could possibly occur within or near the Study Area (Table III-14).

Table III-14
Federally Listed Species Potentially Located in the Study Area

Common Name	Scientific Name	Federal Status
Indiana bat	*Myotis sodalis*	Endangered
Virginia big-eared bat	*Corynorhinus townsendii virginianus*	Endangered
West Virginia northern flying squirrel (WVNFS)	*Glaucomys sabrinus fuscus*	Endangered
Cheat Mountain salamander	*Plethodon nettingi*	Threatened

The USFWS recommended than an analysis of the Study Area be conducted to identify potential habitat and determine the likelihood of these species occurring along the alternatives. If identified, potential habitat was to be surveyed to determine the presence or probable absence of each species. The following subsections discuss the methods used to assess potential impacts to each federally listed threatened or endangered species and describe potential impacts that may result from the project, if any.

3.3.3.1 Indiana Bat

Because the Indiana bat was known to occur within the Study Area, a Biological Assessment (BA) was prepared to evaluate the potential effects of the Corridor H Project on Indiana bat habitat and was submitted on March 22, 1999 to the USFWS. The BA provided an estimate and percentage of potential summer roosting habitat that could be removed by Corridor H if constructed. Given the

small percentage of available habitat that will be removed, the BA concluded that the Indiana bat would not likely be adversely affected by the removal of habitat. The USFWS concurred with the findings of the BA in a letter dated June 21, 1999 (Appendix A).

In addition, a commitment was made to mist-net along Corridor H to detect the presence or probable absence of the Indiana bat. Mist-netting was conducted for all potential alternatives between May 15th and August 15th, 2001. No Indiana bats were captured, thus no further ESA Section 7 consultation is required for the Study Area regarding the Indiana bat. The USFWS concurred with these findings in a letter dated November 9, 2001 (Appendix A). Additional mist-netting or potential roost tree (PRT) removal will be conducted prior to construction activities, as appropriate.

3.3.3.2 Virginia Big-Eared Bat

A Biological Evaluation (BE) was prepared for the Virginia big-eared bat for the Corridor H Project and submitted to the USFWS in February 2001. The BE provided a history of the informal ESA Section 7 consultation regarding the Virginia big-eared bat. In addition, the BE defined and identified essential habitat (including hibernacula, roosting and maternity caves, as well as the foraging areas that surround these habitats) and satellite caves (caves of less importance used periodically) that occur near Corridor H. The BE found that no essential habitat or satellite caves occur within the Study Area for this project. Given that no habitat occurs for the species, no adverse effect would result in the construction of this project. In a letter dated April 18, 2001, USFWS found the BE to be sufficient and concurred in the "no adverse effect" finding (Appendix A).

3.3.3.3 West Virginia Northern Flying Squirrel (WVNFS)

In June 2000, WVDOH and FHWA re-initiated informal consultation with the USFWS during agency coordination for the preparation of this SEIS. During the informal consultation process, the recovery plan for the WVNFS (*Glaucomys sabrinus fuscus*) was being amended to redefine the methods for identifying potential habitat for that species. Because of this potential amendment to the recovery plan, additional live-trapping surveys were conducted for the WVNFS.

Ed Michael, Ph.D., a recognized expert of the WVNFS, investigated the Study Area to identify potential habitat for the squirrel. Dr. Michael identified ten areas of potential habitat. Consistent with USFWS guidelines, live trapping was conducted for ten nights at each site in August and September 2000, and April and May 2001. A total of 10 to 25 live traps were set at each site depending upon the size and suitability of the habitat. During the trapping of 2001, the WVNFS was captured in two locations within the Study Area, along the Right Fork of Big Run and south of Middle Run, both of which are within the cut and fill limits of the OPA. Given this discovery and following further consultation with the USFWS, additional trapping was conducted to determine the extent of the Big Run population in order to develop avoidance alternatives in the western portion of the Study Area.

The results of this survey were reported in a BA prepared for the WVNFS, submitted August 2002. The BA found that the OPA would likely result in an adverse effect to the species and that the avoidance alternatives would not likely adversely affect the WVNFS. In a letter dated October 11, 2002, the USFWS did not concur with this conclusion and stated that any of the alternatives presented in the BA (which are equivalent or very similar to the alternatives presented in this SFEIS) would not avoid suitable habitat for the species (Appendix A). According to the most recent Recovery Plan for the species (USFWS, 2001), suitable habitat for the WVNFS is assumed to be potentially occupied by the species; therefore, any of the alternatives would impact potentially

occupied WVNFS habitat. Further consultation with the USFWS was required to determine which of the alternatives was the least damaging to the WVNFS.

After the ROPA was selected as the Preferred Alternative, a second BA was prepared (August 2004) to evaluate the direct, indirect, and cumulative effects of the ROPA/Preferred Alternative and the other Build Alternatives on the WVNFS and its habitat. The BA concluded all Build Alternatives were "likely to adversely affect" the WVNFS, but the ROPA/Preferred Alternative would be the least damaging to the WVNFS because:

- The ROPA requires the removal of the fewest number of acres of either suitable or highly suitable habitat.
- The ROPA's removal of highly suitable habitat primarily occurs on the highly suitable habitat's edge and minimizes removal of "core" highly suitable habitat.
- The ROPA has less of a barrier effect and better preserves landscape permeability than the other alternatives because the magnitude of cut/fill slopes is less.

In a letter dated October 14, 2004, the USFWS concurred with this conclusion, and stated that formal consultation would be required for all the Build Alternatives (Appendix A).

A Formal Consultation Initiation Package (IP) was prepared after the ROPA was reaffirmed as the Preferred Alternative in the November 2004 Amended Preferred Alternative Report. The IP contained a detailed project description, a discussion of the WVNFS and its natural history, a summary of the direct and indirect impacts, and cumulative effects of the ROPA/Preferred Alternative on the WVNFS and its habitat, and a description of conservation measures that were incorporated into the ROPA/Preferred Alternative.

Formal section 7 consultation was initiated on October 25, 2005 by FHWA and WVDOH. USFWS confirmed the initiation of formal consultation and the completeness of the Initiation Package on November 18, 2005. On March 22, 2006 the USFWS requested an extension for the completion of formal consultation; the request was granted by FHWA on March 30, 2006. A draft BO was issued by USFWS on May 5, 2006. The final BO was issued on November 6, 2006. The BO provides:

- a complete consultation history,
- biological background research and baseline summary,
- confirms the proposed conservation measures,
- terms and conditions associated with the Incidental Take Statement, including Reasonable and Prudent Measures (RPMs) for compliance, and
- a conclusion to the formal consultation process with the detailed reinitiation requirements.

The USFWS has stated that, "…FHWA and the WVDOH have selected the least damaging practicable project construction alternative in regards to the direct removal of *G. s. fuscus* habitat. ….Anticipated adverse effects of the project as a result of direct and indirect loss of habitat have been substantially avoided and minimized." Further, the BO specifically states, "After reviewing the current status of the *G. s. fuscus*, the environmental baseline, the effects of the proposed action and the cumulative effects, it is the Services' Biological Opinion that constructing Corridor H, Parson to Davis, as proposed, is not likely to jeopardize the continued existence of the *G. s. fuscus*."

A timeline for events related to ESA Section 7 consultation (whether informal or formal) on the WVNFS is presented in Table III-15 A summary of the BO is provided after Table 22, below.

Table III-15
ESA Section 7 consultation for the WVNFS

June 2000	USFWS initiates informal ESA Section 7 consultation for the WVNFS during agency coordination for the preparation of the SEIS for the Parsons-to-Davis section of Appalachian Corridor H. The USFWS indicates the WVNFS may occur along the Parsons-to-Davis section and recommends live trap surveys to determine the presence or absence of the species.
July 2000	USFWS provides coordination letter that identifies federally listed species that could occur in the project study area.
August 2000 - May 2001	Live-trapping surveys were conducted in August/September 2000 and April/May 2001 in potential habitat along each of the Build Alternatives being studied at the time that avoided the Blackwater Area and along "shifts" of the OPA (to avoid Big Run Bog in the west). The WVNFS is captured at two locations during the 2001 survey. Twenty-one individuals are captured along the Right Fork of Big Run, and two individuals are captured south of Middle Run. Both capture areas overlap the cut and fill limits of the OPA. Additional live trap surveys are conducted to delineate WVNFS occupation along the Right Fork of Big Run.
July 2001	WVDOH provides coordination letter to USFWS requesting attendance at meeting to discuss potential impacts to WVNFS habitat.
August 2001	The USFWS determines two populations of WVNFS are present in the Parsons-to-Davis section, and encourages FHWA and WVDOH to develop alternatives in the western portion of the area that would not result in an incidental take of the WVNFS (alternatives to the OPA had already been developed to avoid the Blackwater Area, but none had been developed in the western portion of the Parsons-to-Davis section). Meeting held with WVDOH, FHWA, USEPA WVDNR and USFS MNF to discuss project alternatives. WVDOH provides coordination letter to USFWS regarding WVNFS documentation studies within the project study area. USFWS provides coordination letter to WVDOH stating alternatives under consideration would impact WVNFS habitat; recommends the development of measures to avoid and/or minimize potential impacts.
September 2001	The USFWS amends Appendix A of the 1990 WVNFS Recovery Plan. Appendix A provides guidelines for WVNFS habitat identification. The amendment states that if an area exhibits suitable habitat, then it is assumed to be potentially occupied by the WVNFS.
October 2001	FHWA re-issues Notice of Intent in Federal Register. The Study Area is expanded west from the Blackwater Area to include the entire Parsons-to-Davis section; potential WVNFS habitat is mapped for the area; and two Squirrel Avoidance Alternatives (SAAs) are developed.
December 2001	USFWS provides coordination letter to FHWA concurring with expanded study area identified in re-issued October 2001 NOI.
August 2002	A BA is prepared to evaluate the direct effects of the OPA and the two SAAs on the WVNFS and its habitat. The BA concludes the OPA would likely adversely affect the WVNFS, by resulting in an incidental take. Conversely, the BA concluded that the two SAAs were not likely to adversely affect the WVNFS. The BA is submitted to the USFWS for concurrence.

October 2002	Informal field review with USFWS is conducted to review potential WVNFS within the project study area. The USFWS does not concur with the BA conclusions, and states all alternatives are likely to adversely affect the WVNFS. The USFWS recommends further evaluation of suitable habitat along the proposed alternatives. Additionally, the USFWS requests a second BA to compare direct and indirect impacts between alternatives, and to aid in the selection of an alternative that is the least damaging to the WVNFS. Informal ESA Section 7 consultation continues.
December 2002	WVDOH submits SFEIS for agency and public review and comment.
January 2003	USFWS provides coordination letter to WVDOH regarding SDEIS; recommends WVDOH select the least damaging alternative.
November 2003	Meeting held with WVDOH, FHWA, WVDNR and consultants to discussed updated information regarding WVNFS.
December 2003	The OPA is revised to provide a safer access to TCHS, reduce wetland impacts around Middle Run, and to incorporate the Truck Route to bypass the City of Thomas. The Revised Original Preferred Alternative (ROPA) is identified as the Preferred Alternative for the Parsons-to-Davis Project. A Preferred Alternative report (dated December 2003) is submitted in January 2004 to the resource agencies for review and comment.
January 2004	Meeting held with WVDOH, FHWA, USFWS to discuss format consultation procedures and proposed schedule.
February 2004	USFWS provides coordination letter to WVDOH commenting on the December 2003 PA Report and recommends a revised BA be completed for the ROPA/Preferred Alternative. Additional WVNFS habitat mapping provided to USFWS.
April 2004	Meeting held with WVDOH, FHWA and consultants to review and discuss WVNFS habitat mapping.
May 2004	Revised WVNFS habitat mapping provided to USFWS. Field review conducted to further evaluate revised habitat mapping.
July 2004	Meeting held with WVDOH, FHWA, USFWS and consultants to discuss information to be included in revised BA for the WVNFS.
August 2004	A second BA is prepared to evaluate the direct, indirect, and cumulative effects of the ROPA/Preferred Alternative and the SAAs on the WVNFS and its habitat. The BA concludes all alternatives would likely adversely affect the WVNFS, but the ROPA/Preferred Alternative would be the least damaging to the WVNFS. Meeting held with WVDOH, FHWA, USFWS and consultants to discuss comments on revised BA.
September 2004	Comments on revised BA addressed; document sent back to USFWS for review and comment.
October 2004	The USFWS concurs with the BA conclusions. Informal ESA Section 7 consultation is complete, and formal consultation is required for all the project's Build Alternatives.
November 2004	The ROPA is reaffirmed as the Preferred Alternative for the Parsons-to-Davis section of Appalachian Corridor H. An Amended Preferred Alternative Report (dated November 2004) is submitted to the resource agencies for review and comment.

March 2005	USFWS provides coordination letter regarding Amended PA report and does not object to selection of ROPA as the preferred alternative.
July 2005	Meeting held with WVDOH. FHWA, USFWS and consultants to discuss contents of Initiation Package and schedule for formal consultation.
August 2005	Meeting held with WVDOH, FHWA, USFWS and consultants to discuss the results of the additional engineering performed on the Revised Original Preferred Alternative (ROPA). The additional engineering adjusted the excavation in the vicinity of Big Run Bog and Slip Hill Mill Run, and reduced direct impacts to WVNFS habitat by eliminating the need to place excess excavation outside of the construction limits of the highway. The FHWA submits a written request to initiate formal ESA Section 7 consultation for the WVNFS that includes a discussion of the optimized ROPA. The Formal Consultation Initiation Package (IP) includes a detailed project description, a discussion of the WVNFS and its natural history, a summary of direct, indirect, and cumulative impacts, and conservation measures that are incorporated into the project.
September – October 2005	The USFWS requests additional information concerning indirect impacts to WVNFS habitat. The FHWA provides the information in a revised IP.
November 2005	The USFWS determines receipt of all the information necessary to initiate formal consultation. Formal ESA Section 7 consultation begins.
March 2006	The USFWS requests a 30-day extension from the FHWA to complete the Biological Opinion. The FHWA grants the 30-day extension.
May 2006	The USFWS completes and transmits the draft Biological Opinion to the FHWA.
November 2006	The USFWS completes and transmits the final Biological Opinion to the FHWA. Formal section 7 Consultation is complete.

The Biological Opinion (BO) for the WVNFS was developed by USFWS in accordance with Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.). Pertinent background and project documentation was reviewed and considered in the development of the BO. This information included the 1990 USFWA Recovery Plan, 2004 Biological Assessments prepared by WVDOH, 2005 Initiation Package and additional scientific information obtained from the various studies of the WVNFS such as studies from the Monongahela national Forest and the results of required WVNFS surveys performed for various projects in West Virginia. Section 7 consultation for the Parsons-to-Davis Project of Appalachian Corridor H began with project scoping in 2000 and has concluded with the issuance of the final BO for the WVNFS on November 6, 2006 (Appendix C).

WVNFS conservation measures that will be implemented for the Parsons-to-Davis Project are listed below:

- Develop[ed] detailed habitat mapping at the project level (within the action area);

- Conducted additional preliminary engineering was performed to reduce overall impacts to highly suitable and suitable habitat;
- Refined engineering in the vicinity of Middle Run avoid a known population and to reduce impacts to highly suitable habitat;
- Implemented of a 2,000 ft long bifurcated mainline design in the vicinity of Middle Run to minimize potential impact on a potential dispersal corridor;
- Established of a Habitat Mitigation Fund to support WVNFS management and recovery efforts.

The action area for the WVNFS is approximately 6,916 acres. Of these 6,916 acres, approximately 751 acres contain highly suitable habitat (approx. 10% of total acres in the action area) and 3,513 acres contain suitable habitat (approx. 51% of total acres in action area).

The 2003/2004 ROPA projected the removal of approximately 43 acres of highly suitable habitat and 226 acres of suitable habitat. The additional engineering effort refined the ROPA to further reduce impacts to WVNFS habitat and known populations. The refined ROPA/Preferred Alternative will impact/remove approximately 25 acres of highly suitable habitat (3.5% of highly suitable habitat within the action area) and 232 acres of suitable habitat (6.7% of suitable habitat within the action area). In addition to the direct removal of habitat, the ROPA/Preferred Alternative, will result in approximately 107 acres of 'unusable' habitat remnants. Therefore, the total acreage of impact associated with the ROPA/Preferred Alternative is 364 (25 acres of highly suitable habitat, 232 acres of suitable habitat and 107 of unusable habitat remnants). Regarding this impact, the BO states, "Most significantly, the FHWA and WVDOH have selected the least damaging practicable project construction alternative in regards to direct removal of *G. s. fuscus* habitat."

The most disruptive effects to WVNFS habitat will occur during initial construction (construction completion estimates range from 3-5 years) of the roadway and will therefore be temporary. Direct mortality is most likely to occur as the result of tree clearing activities; limited impacts are expected from vehicular strikes. Noise and associated disturbances are not expected to, "…significantly impact essential behavioral patterns, including breeding, feeding, or sheltering (May 2006 draft BO). The May 2006 draft BO also states that cumulative effects "…are not reasonably certain to occur within the action area'.

The May 2006 draft BO has concluded that, "the project has been designed to avoid and minimize these adverse impacts to *G. s. fuscus*, and the action area should be able to sustain reproducing populations after project construction. Further, "…it is the Service's Biological Opinion that constructing Corridor H, Parsons to Davis, as proposed, is not likely to jeopardize the continue existence of the *G. s. fuscus*."

Incidental Take Statement/Reasonable and Prudent Measures (RPMs):

"The Service anticipates that the proposed project could cause incidental take of *G. s. fuscus* either as a result of harm through loss of habitat, or direct mortality." However, implementation of the terms and conditions associated with the reasonable and prudent measures will reduce the potential for incidental take." (May 2006 BO)

RPM 1: Avoid Direct Take of Immobile Young

Action: Potential nest site trees within highly suitable and suitable habitat will be removed only between September 15 and April 1. Non-nesting trees may be cleared between April 2 and September 14.

RPM 2: Reduce impacts of habitat loss by enhancing nesting and foraging habitat in remaining habitat

Action: Install of nest boxes in adjacent forest to enhance nest site availability. A total of 57 nest boxes will be required; nest box locations will be documented and reviewed by USFWS.

Action: During disturbance of highly suitable and suitable habitat, trees and woody debris will be stockpiled in adjacent areas; pile design and location will be documented and reviewed by USFWS.

RPM 3: Reduce barriers to dispersal by retaining and restoring adjacent habitat

Action: Limit clearing and grubbing within the project right-of-way and retain forested areas and spruce trees, as much as possible.

Action: Development a project reclamation plan for revegetated areas; reclamation plan will be development in consultation with the USFWS.

Action: Development of a project maintenance plan for right-of-way; maintenance plan will be development in consultation with the USFWS.

RPM 4: Implement all Proposed Conservation Measures

Action: Implement all conservation measures proposed in 2005 formal consultation Initiation Package (Appendix B).

Action: Establish and execute funding for the WVNFS Habitat Mitigation Fund (as described in Appendix B of the 2005 Initiation Package). These actions are to occur within 30-days of the issuance of the ROD for the Parsons-to-Davis Project.

RPM 5: Develop and implement a monitoring project to track incidental take associated with the Project.

Action: Development of a plan for surveying, monitoring and reporting incidental take of the WVNFS within the action area. The plan will be developed in consultation with the USFWS.

Action: Monitor clearing activities within the action area during construction through mapping and other documentation.

Action: Development and implementation of a tracking program to monitor the WVNFS's response to construction activities.

Action: Annual reporting of all mitigation commitments, status, implementation and data collection.

RPM 6: Implementation of these minimization measures shall be ensured by appropriately informing all project personnel and contractors.

Action: FHWA and WVDOH will commit to providing full disclosure and understanding of the BO requirements for the WVNFS to all contractors working on the project to assure compliance with the goals of the BO. Implementation of the terms and conditions of the RPMs is required for FHWA and the WVDOH to remain in compliance with the requirements of the Incidental Take Statement. Discretionary conservation recommendations are not being recommended by USFWS. Reinitiation requirements are provided in detail in the BO (Appendix C). The issuance of the final BO concludes the formal consultation process.

Note: On July 6, 2005, the United States Fish and Wildlife Service (USFWS), Department of Interior, posted an action notice in the Federal Register relative to the West Virginia Northern Flying Squirrel (WVNFS). The action notice announced the initiation of a five-year review of the endangered Virginia Northern Flying Squirrel (*Glaucomys sabrinus fuscus*) to "…ensure that the listing classification of a species is accurate". A five-year review is based on the best scientific and commercial data available at the time of review including information that has become available since the species listing as an endangered species in 1985 (50 FR 26999-27002). Based on the information received during the review period, the USFWS will determine whether or not a status

change (delisting the species or changing its classification) is necessary for the WVNFS. To date, the USFWS has not posted a decision regarding the status of the species review process for the WVNFS.

3.3.3.4 Cheat Mountain Salamander

Thomas Pauley, Ph.D., a recognized expert of the Cheat Mountain salamander, conducted field investigations to identify potential habitat and the actual presence of the Cheat Mountain Salamander within the Study Area. During the investigation, which focused on high elevation peaks, three areas were found with emergent boulders or rocks and conifer forests that could support the salamander. These areas, as well as other less suitable habitats, were surveyed. No Cheat Mountain Salamanders were found. The survey results were presented in a letter report, submitted to the USFWS July, 2002. In a letter dated August 12, 2002, the USFWS concurred that the Parsons-to-Davis Project is not likely to adversely affect the Cheat Mountain Salamander, and that no further Section 7 consultation is required with regard to this species (Appendix A).

3.3.3.5 Species of Concern

In addition to the list of threatened and endangered species, the USFWS provided a list of 11 Species of Concern that may occur in the Study Area, but not necessarily within the construction limits of the alternatives carried forward for detailed analysis. These species are presented in Table III-16. While Species of Concern are not formally protected by the ESA, the USFWS and the WVDNR encourage continued consideration of these species in environmental planning. Where possible, alternatives were developed to avoid known populations of Species of Concern.

As discussed in *Section 3.3.2.3 Forest Fragmentation and Biodiversity* above, sufficient forest will remain after construction of the project such that wildlife, including Species of Concern, will retain adequate available habitat. In addition, when possible, impacts to aquatic habitat will be avoided and/or minimized.

Table III-16
Species of Concern Potentially Located in the Study Area

Common Name	Scientific Name
Eastern small-footed bat	*Myotis liebii*
Eastern woodrat	*Neatoma floridana magister*
Southern rock vole	*Microtus chrotorrhinus*
Appalachian cottontail rabbit	*Sylvilagus obscurus*
Southern water shrew	*Sorex palustris punctulatus*
Hellbender	*Cryptobranchus alleganiensis*
Cheat minnow	*Rhinichthys bowersi*
Darlington's spurge	*Euphorbia purpurea*
Butternut	*Juglans cinerea*
Northern goshawk	*Accipiter gentilis*
Cerulean warbler	*Dendroica cerulea*

3.3.3.6 State Protection of Species

The State of West Virginia relies upon federal legislation to protect vertebrate, invertebrate, and plant resources. The West Virginia Department of Commerce, Division of Labor, and the West Virginia Natural Heritage Program (WVNHP) within the WVDNR, maintain a database with the known location of federally listed threatened and endangered species, as well as a list of Rare

Species. The WVNHP places species on this list based on their population status within West Virginia. The WVNHP provided a list of the Rare Species found in Tucker County, as well as a list of those with known occurrences within the Study Area. Rare Species, which may be limited in West Virginia for a variety of reasons (e.g., being at the far extent of the species range), but more abundant and widespread in other states, are not afforded special legal protection as are the federally listed threatened and endangered species. However, a review of the impacts to these species was considered in the planning process through coordination with the WVNHP.

3.3.3.7 Avoidance, Minimization, and Mitigation Measures

The only rare, threatened, or endangered species impacted by any of the alternatives is the WVNFS. All of the alternatives presented in this SFEIS would impact habitat potentially occupied by the WVNFS. Stated above, the summary of the BO outlines avoid, minimization and mitigation measures associated with the WVNFS. The summary also outlines the conservation measures and RPMs (reason and prudent measures associated with the Incidental Take Statement). The BO is provided in Appendix C.

The 1996 FEIS, Volume III also provides for:

- The minimization of clearing and grubbing activities to an area extending no more than 10 feet beyond project construction limits.
- The purchase and preservation of uneconomical land remnants and unique habitat to mitigate for upland habitat loss including WVNFS habitat.
- Where practicable, bridges will be designed and constructed to provide riparian buffer strips along stream banks to facilitate wildlife movement.
- The opportunity for resource agencies to review and comment during all design engineering phases.

3.3.4 WETLANDS

Executive Order (E.O.) 11990 establishes a national policy to "avoid to the extent possible the long-term and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative." Wetlands within the Study Area have been evaluated in accordance with E.O. 11990.

3.3.4.1 Methodology

Detailed discussions of the wetland identification and delineation methods used for the Study Area are included in the 1994 Corridor H ASDEIS *Wetlands Technical Report* (WVDOH, 1994f) and the 1996 Corridor H FEIS. Wetlands are defined by the USEPA and the USACE as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (40 CFR § 230.3 and 33 CFR § 328.3). Prior to conducting fieldwork, locations of known wetlands and potential wetland areas were identified using existing data which included the Tucker County Soil Survey (USDA, 1967), USFWS National Wetland Inventory (NWI) Maps, USGS Maps 7.5' Quadrangles, and the USACE Wetland Delineation Manual, January 1987.

Field delineations for wetlands located within the Study Area were conducted by environmental scientists trained in federal wetland identification and delineation procedures according to the Routine Onsite Determination Method outlined in the USACE Wetlands Delineation Manual (Environmental Laboratories, 1987). Wetland data forms are part of the project file and can be viewed upon request. Wetland classification was defined using the classification system developed by the USFWS (Cowardin *et al.*, 1979). All wetland data, including boundaries and vegetation classification, were entered into the project's GIS.

A functions and value evaluation of each wetland located in the Study Area was conducted with the WET 2.1 computer model and a descriptive approach developed by the USACE New England Division (1999). The WET 2.1 model is based on FHWA's Wetland Evaluation Technique (WET) and provides an estimate of the likelihood that a function or value will occur in a wetland in terms of social significance, effectiveness, or opportunity to perform the function. The descriptive approach, developed by the USACE New England Division, provides an approach to graphically represent wetland functions and values either separately or in relationship to other constraints and/or resources.

3.3.4.2 Existing Conditions

The proposed project traverses the Black Fork local watershed within the Cheat River regional watershed. The wetlands found within the Study Area (Exhibit III-4) are primarily high elevation bogs and fens which are dominated by mosses, sedges, and ericaceous shrubs such as blueberries, and many of the wetlands are influenced by beaver activity. A large portion of the local watershed has been disturbed by surface coal mining activities, and numerous wetlands are affected by acid mine drainage.

Approximately 90 percent of the wetlands are located within stream headwaters or within stream floodplains, and form extensive wetland systems (Exhibit III-4). To capture key wetland functions and values, the assessment was performed on groups or systems of wetlands. Wetland systems that were identified in the 1994 ASDEIS Wetland Technical Report 1996 and the Corridor H FEIS were placed in AR-prefix systems. Most of these systems are located along the southern portion of the Study Area and within the Long Run and Middle Run watersheds. CY-prefix wetland systems are located within the floodplain of the North Fork of the Blackwater River. Wetlands within the Snyder Run and Pendleton Creek watersheds located in the northern portion of the Study Area were placed in HJ-prefix systems.

Table III-17 identifies the wetland systems, provides break down of the dominant wetland types within each system, and summarizes of the key functions and values of each system within the Study Area. Thirteen wetland systems were identified within the Study Area. The primary function of the wetland systems is nutrient removal, retention, and transformation, and nine of the wetland systems provide sediment, toxicant, and pathogen retention which is important to mitigate the acidic deposition associated with surface coal mining disturbances within the Study Area. Because most of the wetlands are located within stream headwaters and floodplains, eighty five (85) percent of the wetland systems provide floodflow retention or alteration. Ten of the wetland systems provide wildlife habitat.

3.3.4.3 Potential Impacts

As described in the 1996 Corridor H FEIS, the No-Build Alternative would have no effect on wetlands or wetland systems in the Study Area.

For each Build Alternative, individual wetland impacts by wetland type are provided in Table III-18. Table III-19 provides a summary of potential wetland impacts by wetland type for each Build Alternative. Wetland impacts for each of the alternatives are generally small impacts on small, low quality, palustrine emergent wetland systems. The Blackwater Avoidance Alternatives (1D West, 1D East, 1E, 1G West, and 1G East) and Blackwater Alternative 2 will impact fewer wetlands than the OPA and the ROPA/Preferred Alternative. The increased wetland impacts associated with the ROPA/Preferred Alternative are associated with the addition of the TCHS connection which was added to the ROPA to meet specific purposes derived from the needs analysis conducted for the Parsons-to-Davis SDEIS. A TCHS connection associated with Alternatives 1D West, 1D East, 1E, 1G West, 1G East, and 2 would not increase impacts to wetlands; however, it is not desirable because such a connection would require large cuts in an area of highly suitable WVNFS habitat resulting in additional impacts to this endangered species from the removal of additional habitat and the interdiction of potential dispersal routes.

Table III-17
Wetland System Function and Values

Wetland System	Dominant Wetland Composition	System Acreage	PEM Acreage	PFO Acreage	POW Acreage	PSS Acreage	Key Functions & Values Performed
AR 1	PEM/PFO	48.8	37.9	3.1	7.6	0.1	Wildlife Habitat Nutrient Removal, Retention & Transformation Recreation Production/Nutrient Export Groundwater Interchange Floodflow Retention
AR 2	PEM/PSS	364.3	218.4	3.0	26.3	116.6	Wildlife Habitat Nutrient Removal, Retention & Transformation Sediment, Toxicant, & Pathogen Retention Recreation Groundwater Interchange Floodflow Alteration
AR 3	PEM/PSS	8.0	6.2	0	0	1.8	Wildlife Habitat Endangered Species Habitat Nutrient Removal, Retention & Transformation Sediment, Toxicant, & Pathogen Retention Recreation
AR 4	PEM	8.1	5.0	0	3.1	0	Nutrient Removal, Retention & Transformation Sediment, Toxicant, & Pathogen Retention Recreation Groundwater Interchange
CY1	PEM/PSS	133.2	32.2	1.2	8.4	91.5	Wildlife Habitat Uniqueness and Heritage Nutrient Removal, Retention & Transformation Sediment Retention Recreation Production/Nutrient Export Floodflow Alteration
CY 14	PEM	8.9	7.7	0	1.1	0	Wildlife Habitat Nutrient Removal, Retention & Transformation Sediment, Toxicant, & Pathogen Retention Floodflow Alteration
CY 17	PEM/PSS/PFO	18.7	6.9	0.8	4.0	7.0	Wildlife Habitat Nutrient Removal, Retention & Transformation Sediment, Toxicant, & Pathogen Retention Recreation Production/Nutrient Export Groundwater Interchange Floodflow Alteration
CY 18	PEM	14.9	14.9	0	0	0	Wildlife Habitat Uniqueness and Heritage Nutrient Removal, Retention & Transformation Sediment Retention Floodflow Alteration
HJ 1	PEM/PSS	279.6	67.9	3.2	43.4	165.3	Wildlife Habitat Uniqueness and Heritage Nutrient Removal, Retention & Transformation Sediment, Toxicant, & Pathogen Retention Production/Nutrient Export Floodflow Alteration
HJ 5	PFO	31.0	0	31.0	0	0	Wildlife Habitat Uniqueness and Heritage Nutrient Removal, Retention & Transformation Sediment Retention Floodflow Alteration
HJ 6	PEM/PFO	7.9	0.1	7.8	0	0	Sediment, Toxicant, & Pathogen Retention Floodflow Alteration
HJ 7	PEM/PSS	33.3	32.1	0	0.3	1.0	Wildlife Habitat Nutrient Removal, Retention & Transformation Sediment, Toxicant, & Pathogen Retention Floodflow Alteration
HJ 8	PEM	4.1	4.1	0	0	0	Nutrient Removal, Retention & Transformation Sediment, Toxicant, & Pathogen Retention Floodflow Alteration

Table III-18
Identified Wetlands and Potential Impacts by Alternative

Alternative	Wetland Type	System ID[1]	Wetland ID	Impacted Acreage[2]	Total Size
1D West	PEM	CY 18	CY-18	0.01	14.91
		HJ 8	HJ 8	0.74	4.05
		NS	AR-IW1	0.00	0.07
		AR 2	1265 A	0.15	0.28
		AR 2	1265 B	0.07	0.07
		AR 2	1259 A	0.01	0.36
			Total PEM	0.98	19.74
	PFO	AR 2	PFO 1	0.06	1.88
			Total PFO	0.06	1.88
	PSS	HJ 1	NWI 1	0.00	63.12
		AR 2	1299	0.09	0.16
			Total PSS	0.09	63.28
			ALTERNATIVE 1D WEST TOTAL	**1.13**	**84.90**
1D East	PEM	CY 18	CY-18	0.01	14.91
		HJ 8	HJ 8	0.74	4.05
		HJ 1	NWI-101	0.01	0.70
		NS	AR-IW1	0.00	0.07
		AR 2	3301	0.24	0.28
		AR 2	1233	0.02	6.27
			Total PEM	1.01	26.28
	POW	HJ 1	NWI 100	0.00	0.69
			Total POW	0.00	0.69
	PSS	AR 2	1236	0.04	4.71
		AR 2	1234 A	0.14	0.52
		AR 2	1257	0.54	0.83
			Total PSS	0.72	6.06
			ALTERNATIVE 1D EAST TOTAL	**1.73**	**33.03**
1E	PEM	HJ 8	HJ 8	1.94	4.05
		AR 2	1265 B	0.07	0.07
		AR 2	1259 A	0.03	0.36
			Total PEM	2.04	4.48
	PFO	HJ 5	HJ 5	3.48	31.03
			Total PFO	3.48	31.03
	PSS	HJ 1	NWI 1	0.34	63.12
			Total PSS	0.34	63.12
			ALTERNATIVE 1E TOTAL	**5.86**	**98.63**
1G West	PEM	AR 2	1265 A	0.15	0.28
		AR 2	1265 B	0.07	0.07
		AR 2	1259 A	0.24	0.36
			Total PEM	0.46	0.71
	PFO	HJ 6	HJ 6	0.05	7.76
		AR 2	PFO 1	0.06	1.88
			Total PFO	0.11	9.64
	PSS	HJ 1	NWI 1	0.00	63.12
		AR 2	1299	0.09	0.16
			Total PSS	0.09	63.28
			ALTERNATIVE 1G WEST TOTAL	**0.66**	**73.63**
1G East	PEM	HJ 1	NWI-101	0.01	0.70
		AR 2	3301	0.24	0.28
		AR 2	1233	0.02	6.27
			Total PEM	0.26	7.25
	PFO	HJ 6	HJ 6	0.05	7.76
			Total PFO	0.05	7.76
	POW	HJ 1	NWI 100	0.00	0.69
			Total POW	0.00	0.69
	PSS	AR 2	1236	0.04	4.71
		AR 2	1234 A	0.14	0.52
		AR 2	1257	0.54	0.83
			Total PSS	0.72	6.06
			ALTERNATIVE 1G EAST TOTAL	**1.03**	**21.76**

Alternative	Wetland Type	System ID[1]	Wetland ID	Impacted Acreage[2]	Total Size
ROPA/ PREFERRED ALTERNATIVE	PEM	AR 3	1363 B	0.12	0.12
		AR 3	1363 A	0.04	0.04
		AR 3	1339 D	0.14	0.49
		AR 1	1334	0.62	1.21
		AR 3	1343	0.03	0.03
		AR 1	1333 C	0.08	1.23
		NS	1332 C	0.02	0.06
		NS	1306	0.21	0.91
		HJ 1	1301 A	0.16	6.27
		HJ 1	1301 B	0.02	0.02
		HJ 1	1301 C	0.02	0.02
		AR 2	1260	0.05	0.10
		AR 2	1261	0.56	7.42
		AR 2	1263	0.71	0.71
		AR 2	1262	1.18	1.48
		AR 2	1264	1.16	1.17
		AR 2	1265 B	0.07	0.07
		AR 2	1259 A	0.04	0.36
		HJ 1	1266	2.96	21.66
		CY 1	CY 15	0.05	1.41
			Total PEM	8.24	44.78
	PFO	NS	3311	1.18	12.51
		NS	1354 F	0.19	0.44
			Total PFO	1.37	12.95
	POW	HJ 1	POW 5	0.43	0.43
		AR 2	POW 6	0.10	0.10
		AR 3	POW 7	0.01	0.01
		NS	AR 1-1	0.03	0.34
			Total POW	0.57	0.88
	PSS	AR 3	1362 B	0.22	0.25
		AR 3	1362 A	0.05	0.05
		AR 3	1339 F	0.39	0.56
		HJ 1	1268	0.26	29.00
		AR-2	1299	0.03	0.16
			Total PSS	0.95	30.02
			ROPA/PREFERRED ALTERNATIVE TOTAL	**11.13**	**88.63**
OPA	PEM	AR 3	1363 B	0.13	0.13
		AR 3	1363 A	0.04	0.04
		AR 3	1339 D	0.28	0.49
		AR 3	1343	0.03	0.03
		AR 1	1333 B	0.27	0.88
		NS	1306	0.22	0.91
		HJ 1	1301 A	0.16	6.27
		HJ 1	1301 B	0.02	0.02
		HJ 1	1301 C	0.02	0.02
		AR 2	1260	0.00	0.10
		AR 2	1261	0.44	7.42
		AR 2	1263	0.02	0.71
		AR 2	1262	1.14	1.48
		AR 2	1264	0.82	1.17
		AR 2	1265 B	0.07	0.07
		AR 2	1259 A	0.04	0.36
		HJ 1	1266	2.04	21.66
		CY 1	CY 15	0.05	1.41
			Total PEM	5.79	43.17
	PFO	NS	3311	0.53	12.51
		NS	1354 F	0.06	0.44
			Total PFO	0.59	12.95
	POW	HJ 1	POW 5	0.43	0.43
		AR 2	POW 6	0.10	0.10
		AR 3	POW 7	0.01	0.01
			Total POW	0.54	0.54
	PSS	AR 3	1362 B	0.25	0.25
		AR 3	1362 A	0.05	0.05
		AR 3	1339 F	0.49	0.56
		HJ 1	1268	0.26	29.00
		AR-2	1299	0.03	0.16
			Total PSS	1.08	30.02
			OPA TOTAL	**8.00**	**86.68**

Alternative	Wetland Type	System ID[1]	Wetland ID	Impacted Acreage[2]	Total Size
2	PEM	NS	3309	0.05	28.37
		AR 3	1363 B	0.11	0.13
		AR 3	1363 A	0.04	0.04
		AR 3	1339 D	0.04	0.49
		AR 3	1343	0.03	0.03
		AR 1	1334	0.56	1.21
		NS	1332	0.00	0.06
		AR 1	1333 C	0.06	1.23
		NS	1306	0.21	0.91
		HJ 1	1301 A	0.14	6.27
		HJ 1	1301 B	0.02	0.02
		HJ 1	1301 C	0.02	0.02
		AR 2	1261	0.19	7.42
		AR 2	1263	0.64	0.71
		AR 2	1262	1.04	1.48
		AR 2	1264	0.85	1.17
		AR 2	1265 B	0.07	0.07
		AR 2	1259 A	0.04	0.36
		HJ 1	1266	0.10	21.66
		CY 1	CY 15	0.05	1.41
			Total PEM	4.26	73.06
	POW	HJ 1	POW 5	0.27	0.43
		AR 2	POW 6	0.10	0.10
		AR 3	POW 7	0.01	0.01
		NS	AR 1-1	0.01	0.34
			Total POW	0.39	0.88
	PSS	AR 3	1362 B	0.18	0.25
		AR 3	1362 A	0.04	0.05
		AR 3	1339 F	0.24	0.56
		HJ 1	1268	0.52	29.00
		AR-2	1299	0.03	0.16
			Total PSS	1.01	30.02
			ALTERNATIVE 2 TOTAL	**5.66**	**103.96**

[1] NS indicates a wetland that was not part of a wetland system.
[2] Impact values of 0.00 indicate that impacts to the wetland are less than 0.01 acre.

Table III-19
Summary of Wetland Impacts By Build Alternative

Alternative	PEM	PSS	PFO	POW	Total
1D West	0.98	0.09	0.06	0	1.13
1D East	1.01	0.72	0	0	1.73
1E	2.04	0.34	3.48	0	5.86
1G West	0.46	0.09	0.11	0	0.66
1G East	0.26	0.72	0.05	0	1.03
OPA	5.79	1.08	0.59	0.54	8.00
2	4.26	1.01	0	0.39	5.66
ROPA/Preferred Alternative	8.24	0.57	1.37	0.57	11.13

3.3.4.4 Avoidance, Minimization & Mitigation Measures

To the maximum extent practicable, the impacts to wetlands have been avoided or minimized through an interdisciplinary, interagency approach and the use of the GIS prepared for the project. Discussions of mitigation activities are included in the 1996 Corridor H FEIS (WVDOH, 1996, pp. III-178 through III-184, and *Volume III: Mitigation Document*, p.7). In addition, two compensatory wetland sites totaling 45.5 acres were constructed between 1996 and 1998 to mitigate for wetlands potentially impacted by the entire Corridor H project. Research conducted by West Virginia University has determined that each of the sites supports a diverse flora and fauna, and provides a plethora of wetland functions and values. The Section 404 Permit, issued in 1996, authorizes activities (including discharges) into jurisdictional surface waters. The permit authorizes these activities through December 2007, and provides a process for extending the approved authorization period. The permit terms and conditions will be updated addressed, as required, as part of the on-going agency coordination process outlined in Volume III of the 1996 Corridor H FEIS. Comment and coordination letters are provided in Appendix A.

3.3.5 WATERSHEDS & STREAMS

3.3.5.1 Methodology

The methodology employed in evaluating baseline conditions and the potential environmental consequences on affected watersheds and surface water resources included a review of published information, detailed field investigations, GIS analysis, and the use of Rapid Bioassessment Protocol (RBP) procedures (Plafkin *et al.*, 1989) for select streams in the Study Area. The RBP data gathering protocol and analysis is detailed in the 1994 Corridor H ASDEIS *Streams Technical Report* (WVDOH, 1994d) and the 1996 Corridor H FEIS, which are incorporated here by reference. Summary results of these analyses are provided in the following sections. Additionally, partly in response to comments received from resource agencies, the stream analysis presented in the SDEIS (December 2002) has been refined.

To complete the more refined analysis, the stream segments of each of those "streams" identified on project preliminary engineering design mapping as impacted (i.e., culverted, relocated or filled) were investigated in the field and classified (i.e., drainage ditches, ephemeral streams, intermittent streams or perennial streams) based on standard field techniques. Following this classification, the water quality of each of the identified intermittent and perennial streams was determined based on data obtained from the WVDNR and/or WVDEP.

In a letter dated May 7, 2004 (Appendix A), the USFS MNF expressed specific concerns regarding Slip Hill Mill Run and Mill Run which are native brook trout streams impacted by the ROPA. In

response to these concerns, more detailed analysis of these streams was conducted to characterize existing stream debris load and water quality, to determine if brook trout use the headwater tributaries of Slip Hill Mill Run and Mill Run, and to better assess the potential direct and indirect impacts to these sensitive streams. Based upon the results of this analysis, advanced preliminary engineering was conducted to minimize the ROPA's impact to WVNFS habitat and reduce the amount of highway fill placed within the Slip Hill Mill Run watershed.

3.3.5.2 Existing Conditions

Cheat River Regional Project Watershed

The Parsons-to-Davis project is within the Cheat River Regional Project Watershed (as defined in the 1996 Corridor H FEIS). The Cheat River drains approximately 1,425 square miles of seven counties in West Virginia, Maryland, and Pennsylvania. The river is formed near Parsons, West Virginia, at the confluence of the Black Fork and Shavers Fork Rivers. It flows north to its confluence with the Monongahela River at Point Marion, Pennsylvania. The Cheat River watershed, including all its tributaries, consists of parts of Pocahontas, Randolph, Tucker, Preston, and Monongalia counties in West Virginia.

The Cheat River watershed is the largest free-flowing watershed in the eastern United States. Above Parsons, the major contributing watersheds in and outside of the Study Area include Black Fork, Shavers Fork, Dry Fork, Blackwater River, Laurel Fork, Glady Fork, and Red Creek. Much of the Cheat River Regional Project Watershed land use consists of undeveloped rural land dominated by deciduous and mixed forests (84 percent) and cropland and pasture (12 percent). Part of the MNF, including the Congressionally-designated Otter Creek and Dolly Sods Wilderness areas, lie within the Cheat River Regional Project Watershed. These wilderness areas are not impacted by the proposed project.

Coal mining has impacted a number of sub-basins within the Cheat River drainage system. The lower portion of this Regional Project Watershed has been severely polluted by acid drainage, much of which comes from abandoned deep and surface coal mines. Although the lower Cheat River has been degraded by acid drainage for many years, recent spills from active mine operations, primarily within the Muddy Creek watershed, have compounded the situation to the point where downstream recreation is threatened (Skousen, 2001).

Black Fork Local Project Watershed

Within the Cheat River Regional Project Watershed, the Study Area overlaps the Black Fork Local Project Watershed (as defined in the 1996 Corridor H FEIS). The Black Fork Local Project Watershed drains 153 square miles of land along Backbone Mountain, Canaan Mountain, Canaan Valley, and Beaver Creek. There are an estimated 117 miles of perennial stream within this local watershed, including the North Fork of the Blackwater River, Mill Run, Slip Hill Mill Run, Long Run, Middle Run, Tub Run, Pendleton Creek, Blackwater River, and Beaver Creek. Primary stream systems and contributing watersheds are depicted in Exhibit III-4.

A large portion of the Black Fork Local Project Watershed has been subjected to deep and surface coal mining. As a result, many abandoned deep and surface mines in the area discharge untreated mine drainage including the drainage areas for Beaver Creek, North Fork, Pendleton Creek, Long Run, and Middle Run (Skousen, 2001). In addition to human-induced acid mine drainage, naturally acidic conditions are found in the headwaters of Big Run, Tub Run, Long Run, and Middle Run which drain bog-like wetlands resulting in tannic water and naturally low pH. There are two native brook trout streams (Slip Hill Mill Run and Mill Run) and three state-listed high quality streams (North Fork of the Blackwater River, Pendleton Creek and Beaver Creek) located within the Study Area (WVDNR, 2001).

Affected Project Basins and Primary Stream Systems

Primary stream systems within the Study Area were previously assessed using the RBP (Plafkin *et. al.*, 1989). Stream data contained in this study (Parsons-to-Davis) were previously assessed in the 1994 Corridor H ASDEIS *Streams Technical Report*. Relevant stream data were incorporated into this study in order to make comparisons among the alternatives. In addition, Slip Hill Mill Run and Mill Run were further examined in 2004, and these findings are detailed after the following discussion of Study Area streams.

In total, 24 streams within the Black Fork local watershed were field investigated for the Corridor H Project. Two methods of evaluation were performed at each sampling point, a habitat assessment and a benthic macroinvertebrate survey, the methods and results of which were previously described in detail in the 1994 Corridor H ASDEIS. The habitat assessment measured parameters such as bottom substrate, embeddedness, stream flow, channel alteration, bottom scouring and deposition, pool:riffle or run:riffle ratio, bank stability, bank vegetation stability, and streamside cover. Numerical scores, given for each parameter, were totaled and assigned a habitat assessment score. Habitat assessment scores were divided into five classes:

- 0 to 30 – Severely Impaired
- 31 to 60 – Impaired
- 61 to 90 – Moderate
- 91 to 120 – Good
- 121 to 135 - Excellent

The benthic macroinvertebrate community was also used to indicate the overall water quality of each potentially impacted stream. One analysis tool used to assess the benthic macroinvertebrate community was the Hilsenhoff Biotic Index (HBI). This index is used to determine the overall water quality and the degree of organic pollution of a stream (Hilsenhoff, 1988). HBI scores less than 5.00 indicate "Excellent" to "Good" water quality, and "Unlikely" to "Some" degree of organic pollution. Water quality and benthic data collected at multiple sites throughout a stream were pooled to assess the overall stream condition. Table III-20 presents the results of these surveys.

Table III-20
Summary of Baseline Aquatic Habitat Value for Streams within the Study Area

Site ID	Stream Name	Habitat Assessment Score		HBI Score		pH
MC3304	Trib. to Mill Run	66	Moderate	2.17	Excellent	4.0
MC3302	Slip Hill Mill Run*	56	Impaired	1.20	Excellent	5.0
MC3303	Trib. Slip Hill Mill Run*	66	Moderate	3.86	Very Good	6.0
MC1311	Big Run	85	Moderate	4.16	Very Good	4.5
MC1312	Trib. Big Run	91	Good	3.67	Excellent	4.5
MC1310	Tub Run	105	Good	5.09	Fair	4.1
MC1305	Long Run	65	Moderate	8.00	Very Poor	2.9
MC1306	Long Run	72	Moderate	9.00	Very Poor	3.2
MC1307	Long Run	74	Moderate	6.18	Fairly Poor	6.2
MC1308	Long Run	79	Moderate	5.50	Fair	6.1
MC3311	Trib. Long Run	51	Impaired	8.00	Very Poor	4.0
MC3312	Long Run	87	Moderate	3.95	Very Good	6.5
MC3309	Snyder Run	70	Moderate	2.90	Excellent	5.0
MC3310	Trib. Snyder Run	68	Moderate	8.00	Very Poor	6.0

Site ID	Stream Name	Habitat Assessment Score		HBI Score		pH
MC1309	Middle Run	57	Impaired	5.92	Fairly Poor	6.0
MC1302	N.F. Blackwater River	87	Moderate	10.00	Very Poor	6.9
MC1303	Trib. N.F. Blackwater River	64	Moderate	10.00	Very Poor	2.8
MC1304	N.F. Blackwater River	65	Moderate	8.00	Very Poor	4.0
MC3301	N.F. Blackwater River	90	Moderate	7.84	Very Poor	6.8
MC1211	Trib. Pendleton Creek	38	Impaired	7.28	Very Poor	7.0
MC1212	Pendleton Creek	86	Moderate	6.00	Fairly Poor	6.5
MC1213	Trib. Pendleton Creek	32	Impaired	6.28	Fairly Poor	7.0
MC1209	Trib. Beaver Creek	60	Moderate	8.00	Very Poor	6.0
MC1210	Trib. Beaver Creek	62	Moderate	7.49	Very Poor	6.5

*HBI score was calculated from benthic macroinvertebrate data collected in 2004.

Seventy percent of the streams sampled within the Black Fork Local Project Watershed have moderate habitat, and HBI scores above 5 (fair to very poor HBI scores) indicating poor water quality. Big Run, Snyder Run, Slip Hill Mill Run, and Mill Run exhibited moderate to high water quality (HBI scores below 5). Slip Hill Mill Run and Mill Run support native trout populations, and the headwaters of these streams are located within the Study Area.

The pH of streams in the Study Area ranges from 2.9 to 7. Nine (9) of the 24 streams (38%) exhibit a pH below 5 which is generally considered to be acidic and toxic to aquatic organisms. Soils in the Study Area are consistently acidic to highly acidic (USDA, 1967), and disturbance to the soils and their parent material from surface coal mining activities likely contribute to the lower pH levels detected in streams.

Slip Hill Mill Run

Slip Hill Mill Run is a tributary to Mill Run and flows through the western most portion of the Study Area (Exhibit III-4). Both streams are known to contain reproducing populations of native brook trout. The OPA approved in the 1996 Record of Decision (ROD) did not directly impact Slip Hill Mill Run because it was located outside of the stream's watershed boundary approximately one half mile north of Big Run Bog, a National Natural Landmark. While the OPA did not directly impact Big Run Bog, it crossed the northwestern portion of its watershed.

While the 1996 Corridor H FEIS addressed Big Run Bog and presented results of the FHWA's Section 4(f) analysis, the WVDOH received additional comments regarding Big Run Bog from the National Park Service (NPS) in March 1997. In response to those comments, WVDOT conducted additional studies and analyses to determine the potential impact of the OPA on Big Run Bog's contributing watershed, and developed alternative alignments that would avoid any encroachment on the Big Run Bog watershed. In 1998 the OPA was shifted (post-1996 ROD) to the north-northwest to further avoid direct impact to Big Run Bog and its watershed, and the Settlement Agreement requires the FHWA and WVDOT to ensure that construction limits for the Parsons-to-Davis Project are located outside the drainage area for Big Run Bog. The alignment shift to avoid

the Big Run Bog watershed placed the alignment alternatives for the Parsons-to-Davis Project within the Slip Hill Mill Run and Mill Run watersheds.

In May 2004, the USFS MNF provided comments to the December 2003 Preferred Alternative Report that was circulated for agency comment in January 2004 (Appendix A). In these comments, the USFS MNF expressed concern that the construction of the Parsons-to-Davis Project may increase the sediment burden of Slip Hill Mill Run and Mill Run which may impact brook trout reproductive success within these streams. In response to these comments, the WVDOH conducted additional studies within the Slip Hill Mill Run watershed to establish baseline physical and biological stream condition within the proposed project area, and downstream of the project area.

Slip Hill Mill Run headwaters consist of many springs and intermittent and perennial tributaries located along the crest and western slope of Backbone Mountain. There is one perennial unnamed tributary and several intermittent and ephemeral tributaries that originate from culverts carrying drainage away from existing US 219 (Figure III-5).

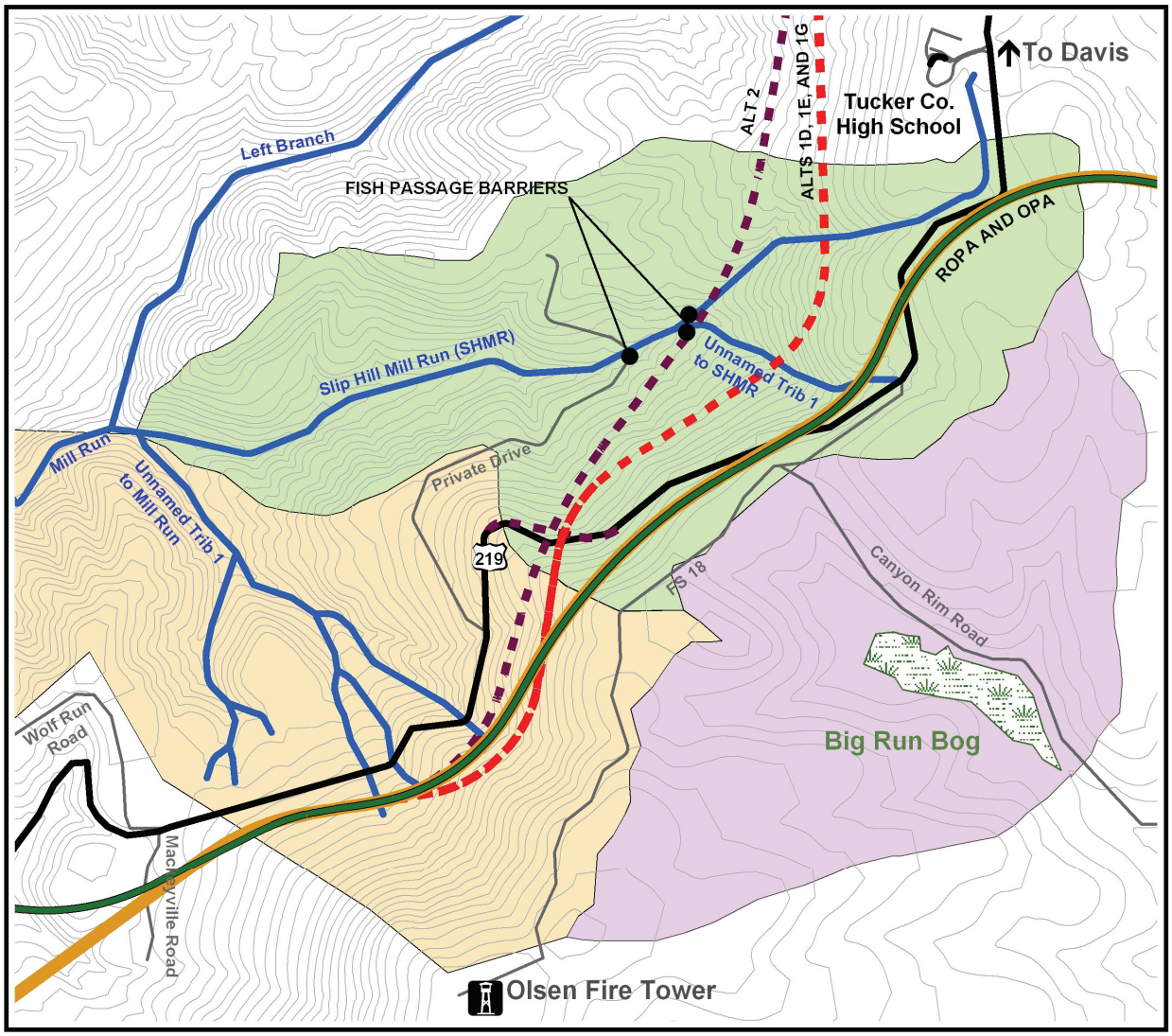

Figure III-5
Slip Hill Mill Run

Slip Hill Mill Run and its unnamed tributary have steep slopes resulting in a cascading, step-pool morphology. First order streams of this type do not generally provide suitable brook trout spawning habitat because of the violent nature of these streams during high flow periods. Generally, high stream flow events occur in West Virginia during the spring and fall when brook trout typically spawn. In addition, an approximately 20-foot rock drop and an undersized culvert carrying a private road over Slip Hill Mill Run were discovered downstream of the Build Alternatives during surveys conducted in 2004 (Figure III-5). It is unlikely that brook trout could successfully migrate upstream beyond these potential barriers.

Ninety-four (94) percent of the watershed is forested with highly erosive soils (USDA 1967). The physical characteristics of the watershed indicate a high sediment load; however, pebble counts yielded normal particle size distribution with a predominance of gravel indicating the streams are effectively moving fine sediment through the watershed.

The results of benthic macroinvertebrate sampling and habitat assessment reflect the high quality of Slip Hill Mill Run. HBI values ranged from 1.20 to 3.00 in Slip Hill Mill Run and from 2.88 to 3.86 in the unnamed tributary indicating "Very Good" to "Excellent" water quality, and stream pH ranged from 5 to 6.

3.3.5.3 Potential Impacts

As described in the 1996 Corridor H FEIS, the No-Build Alternative would have no effect on streams in the Study Area.

For each Build Alternative, Table III-21 and Table III-22 provide details of potential impacts to streams for comparison. The actual length of stream loss is based on 1:200 mapping and was measured from the centerline of a stream (including meanders). Stream impact type (i.e. relocation or enclosure) for each Build Alternative is summarized in Table III-23. Blackwater Alternative 2 and the ROPA/Preferred Alternative would result in the greatest lengths of enclosures or relocations to streams in the Study Area. However, historic coal mining activities within the watersheds of the majority of the Study Area streams have resulted in poor water quality. The only streams in the Study Area that have not been historically impacted by coal mining activities are Mill Run and Slip Hill Mill Run. All of the Build Alternatives would impact tributaries to Mill Run and Slip Hill Mill Run. However, the ROPA/Preferred Alternative would result in less direct impact to these sensitive watersheds because it crosses the headwaters of the Mill Run and Slip Hill Mill Run watersheds located along the crest of Backbone Mountain (Figure III-5). Potential impacts to Slip Hill Mill Run are discussed separately.

Table III-21
Parsons-to-Davis Inventory of Stream Impacts (For Alternatives 1D West, 1D East, 1E, 1G West, 1G East)

Stream Name	1D West						1D East						1E						1G West						1G East					
	Bridge	Enclosures	Relocation	Culvert Length(ft)	Relocation Length(ft)	Impact Length(ft)	Bridge	Enclosures	Relocation	Culvert Length(ft)	Relocation Length(ft)	Impact Length(ft)	Bridge	Enclosures	Relocation	Culvert Length(ft)	Relocation Length(ft)	Impact Length(ft)	Bridge	Enclosures	Relocation	Culvert Length(ft)	Relocation Length(ft)	Impact Length(ft)	Bridge	Enclosures	Relocation	Culvert Length(ft)	Relocation Length(ft)	Impact Length(ft)
Mill Run		1		324		326		1		324		326		1		324		326		1		324		326		1		324		326
UT-1 of Mill Run			1			77			1			77			1			77			1			77			1			77
UT-1 to UT-1 of Mill Run		1		387		401																								
UT-1 to UT-2 to UT-1 of Mill Run																														
UT-3 to UT-1 of Mill Run																														
Slip Hill Mill Run		1		387		401		1		387		401		1		547		557		1		387		401		1		387		401
UT-1 of Slip Hill Mill Run	1						1							1		824		848	1						1					
UT-1 of Left Branch			1			344			1			344			1			365			1			291		1				291
UT-2 of Left Branch																														
Big Run																														
UT-4 of Big Run	1								1			65			1			109			1			65			1			65
UT-1 to UT-2 of Tub Run																														
UT-2 of Tub Run																														
Long Run	1		1		100	32	1		1		100	32	1						1		1		100	32	1		1		100	32
Middle Run																														
UT-2 of Middle Run																					1		80	159			1		80	159
UT-1 to UT-2 of Middle Run																				1	1	133	105	301		1	1	133	105	301
UT-1 to UT-1 to UT-2 of Middle Run																					1			127			1			127
UT-2 to UT-1 to UT-2 of Middle Run																					1		28	28			1		28	28
Snyder Run	1						1						1						1						1					
UT-5 of Snyder Run		1		477		522	1	1		477		522		1		387		400												
Ut-1 to UT-6 to UT-5 of Snyder Run			1			134			1			134			1			134												
UT-15 of Snyder Run			1	233		258		1		233		258		1		466		510												
UT-3 to UT-15 of Snyder Run		1		193		194			1		193	194		1		386		423												
UT-4 to UT-15 of Snyder Run			1		159	112			1		159	112			1			40												
UT-6 of Snyder Run																					1			45			1			45
UT-1 to UT-6 of Snyder Run																					1			16			1			16

Stream Name	1D West						1D East						1E						1G West						1G East					
	Bridge	Enclosures	Relocation	Culvert Length(ft)	Relocation Length(ft)	Impact Length(ft)	Bridge	Enclosures	Relocation	Culvert Length(ft)	Relocation Length(ft)	Impact Length(ft)	Bridge	Enclosures	Relocation	Culvert Length(ft)	Relocation Length(ft)	Impact Length(ft)	Bridge	Enclosures	Relocation	Culvert Length(ft)	Relocation Length(ft)	Impact Length(ft)	Bridge	Enclosures	Relocation	Culvert Length(ft)	Relocation Length(ft)	Impact Length(ft)
UT-1 of Sand Run		1			290	314		1			290	314																		
UT-1 to UT-2 to UT-2 of Sand Run			1			202				1		202																		
UT-3 to UT-2 to UT-2 of Sand Run		1		423		429		1		423		429																		
North Fork Blackwater River	1						1						1						1						1					
UT-7 of North Fork Blackwater River	1	1		720		784	1	1		720		784		1		205		700		1		720		784		1		720		784
UT-2 to UT-7 of North Fork Blackwater River			1			91			1			91		1		233		251		1	1	380		603		1	1	380		603
UT-3 to UT-7 of North Fork Blackwater River		1		351		425		1		351		425			2		821	1289			1			210			1			210
UT-1 to UT-3 to UT-7 of North Fork Blackwater River																					1		43	15			1		43	15
UT-2 to UT-3 to UT-7 of North Fork Blackwater River			1		95	113			1		95	113			1			511		1		250		265		1		250		265
UT-9 of North Fork Blackwater River															1	192		192	1						1					
UT-11 of North Fork Blackwater River																			1		1		53	30	1		1		53	30
Pendleton Creek	1						1						1						1						1					
UT-3 of Pendleton Creek								1		353		364														1		353		364
UT-5 of Pendleton Creek																														
UT-2 TO UT-5 of Pendleton Creek																														
UT-7 of Pendleton Creek																														
UT-8 of Pendleton Creek																														
Totals	**7**	**9**	**9**	**3,495**	**644**	**5,159**	**7**	**9**	**9**	**3,269**	**837**	**5,187**	**4**	**8**	**9**	**3,564**	**821**	**6,732**	**7**	**6**	**14**	**2,194**	**409**	**3,775**	**7**	**8**	**13**	**2,414**	**409**	**4,139**

NOTE: Cells with no values indicate no impacts.

Table III-22
Parsons-to-Davis Inventory of Stream Impacts (For ROPA/Preferred Alternative, OPA, Alternative 2)

Stream Name	ROPA/Preferred Alternative						OPA						2					
	Bridge	Enclosures	Relocation	Culvert Length(ft)	Relocation Length(ft)	Impact Length(ft)	Bridge	Enclosures	Relocation	Culvert Length(ft)	Relocation Length(ft)	Impact Length(ft)	Bridge	Enclosures	Relocation	Culvert Length(ft)	Relocation Length(ft)	Impact Length(ft)
Mill Run								1		337		335		1		511		521
UT-1 of Mill Run		2		1376		1028		1		435		298		1		305		305
UT-1 to UT-1 of Mill Run															1			321
UT-1 to UT-2 to UT-1 of Mill Run		2	1	385	630	467												
UT-3 to UT-1 of Mill Run			1		473	396												
Slip Hill Mill Run		2	1	633	311	1535			1		244	297		1	1	1850	480	2938
UT-1 of Slip Hill Mill Run		1		1383		1456	1		1		191	151			1		335	1890
UT-1 of Left Branch														1		450		458
UT-2 of Left Branch															1		188	
Big Run		1		714		719		1		477		479						
UT-4 of Big Run															1		75	79
UT-1 to UT-2 of Tub Run			1		605	408			1		383	508						
UT-2 of Tub Run		1		292		330		1		353		378		1		327		279
Long Run		1		504		565		1		677		761		1		459		486
Middle Run		1		432		447		1		303		312		1		402		405
UT-2 of Middle Run																		
UT-1 to UT-2 of Middle Run																		
UT-1 to UT-1 to UT-2 of Middle Run																		
UT-2 to UT-1 to UT-2 of Middle Run																		
Snyder Run																		
UT-5 of Snyder Run																		
UT-1 to UT-6 to UT-5 of Snyder Run																		
UT-15 of Snyder Run																		
UT-3 to UT-15 of Snyder Run																		
UT-4 to UT-15 of Snyder Run																		
UT-6 of Snyder Run																		
UT-1 to UT-6 of Snyder Run																		

Stream Name	ROPA/Preferred Alternative						OPA						2					
	Bridge	Enclosures	Relocation	Culvert Length(ft)	Relocation Length(ft)	Impact Length(ft)	Bridge	Enclosures	Relocation	Culvert Length(ft)	Relocation Length(ft)	Impact Length(ft)	Bridge	Enclosures	Relocation	Culvert Length(ft)	Relocation Length(ft)	Impact Length(ft)
UT-1 of Sand Run																		
UT-1 to UT-2 to UT-2 of Sand Run																		
UT-3 to UT-2 to UT-2 of Sand Run																		
North Fork Blackwater River	1						1						1					
UT-7 of North Fork Blackwater River																		
UT-2 to UT-7 of North Fork Blackwater River																		
UT-3 to UT-7 of North Fork Blackwater River			1		12	12			1		12	12			1		12	12
UT-1 to UT-3 to UT-7 of North Fork Blackwater River			1		320	320			1		320	320			1		320	320
UT-2 to UT-3 to UT-7 of North Fork Blackwater River		1		115		115		1		115		115		1		115		115
UT-9 of North Fork Blackwater River																		
UT-11 of North Fork Blackwater River																		
Pendleton Creek		1		222		262		1		261		261		1		228		603
UT-3 of Pendleton Creek																		
UT-5 of Pendleton Creek		1		150		235		1		150		235		1		150		235
UT-2 to UT-5 of Pendleton Creek		1		155		230		1		155		230		1		155		230
UT-7 of Pendleton Creek				494		482		1		540		640		1		401		503
UT-8 of Pendleton Creek		1		163		270			1		308	325			1		250	245
Totals	**1**	**16**	**6**	**7,018**	**2,351**	**9,277**	**2**	**11**	**6**	**3,803**	**1,458**	**5,657**	**1**	**12**	**8**	**5,353**	**1,660**	**9,945**

NOTE: Cells with no values indicate no impacts.

Table III-23
Summary of Stream Impacts Based On Total Length of Enclosure, and Total Length of Relocations*

Alternative	Actual Impacted Length (ft)	Number of Enclosure	Culvert Length (ft)	Number of Relocation	Relocation Length (ft)
1D West	5,159	9	3,495	9	644
1D East	5,187	9	3,269	9	837
1E	6,732	8	3,564	9	821
1G West	3,775	6	2,194	14	409
1G East	4,139	8	2,414	13	409
OPA	5,651	11	3,803	6	1,458
2	9,945	12	5,353	8	1,660
ROPA/Preferred Alternative	9,277	16	7,018	6	2,351

*Does not include impacts to drainage ditches.

Potential Impacts to Slip Hill Mill Run

Each Build Alternative will directly impact Slip Hill Mill Run by placing segments of the stream into culverts (Table III-21 and Table III-22). In addition to the culverts, highway construction in mountainous terrain generally requires long and high cuts and fills that disturb large areas, and the magnitude of the cuts and fills is directly related to landscape position and topography. Disturbance to forested areas will likely increase the sediment loading within the Slip Hill Mill Run watershed because of the steep slopes within the watershed and the high erosion potential of the soils. Studies conducted by the Monongahela National Forest during the mid 1990's indicate that Slip Hill Mill Run currently has a sediment load approaching the danger threshold for native trout that inhabit that stream downstream of the Study Area.

Blackwater Avoidance Alternatives 1D West and East, 1E, 1G West and East, and Blackwater Alternative 2 are located along the steep western slope of Backbone Mountain. The magnitude of the cut and fills required at this location would disturb large forested areas within the watershed, and thus expose large areas of denuded soil during construction. Exposure of these areas may increase the potential for increased sedimentation into Slip Hill Mill Run. Conversely, the ROPA/Preferred Alternative and OPA cross the headwaters of Slip Hill Mill Run near the crest of Backbone Mountain where the topography is not as steep. Therefore, the cut and fills associated with the ROPA/Preferred Alternative and OPA would not be as long and high, and would disturb less forested area within the watershed.

3.3.5.4 Avoidance, Minimization, and Mitigation

The preliminary design of the Build Alternatives carried forward for detailed analysis employed general and alternative-specific avoidance and minimization measures. Minimization and mitigation of surface water resource impacts will follow the guidelines and agreements detailed in the 1994 Corridor H ASDEIS Streams Technical Report and the 1996 Corridor H FEIS (including the Mitigation Document), and are incorporated into this document by reference. Based on those guidelines and agreements, impacts to streams were to be avoided to the extent practicable based on the following principles:

- Attempt to avoid know native and stocked trout streams, bridge where practicable;
- Attempt to avoid longitudinal impacts to perennial streams and riparian forests;
- Attempt to bridge perennial streams, if practicable, to avoid culverts and/or relocations; and
- Attempt to avoid skewed crossings of perennial streams in order to minimize the length of culverts and pipes.

Avoidance and minimization measures developed during the preliminary design process and further refined during ESA Section 7 consultation included adjustments of the ROPA/Preferred Alternative (horizontal alignment) and the width of the construction limits (vertical alignment) where practicable. The horizontal and vertical alignments were adjusted to avoid and/or minimize the number and length of relocations and enclosures. However, the adjustments were constrained by the presence of other sensitive resources (e. g. WVNFS habitat, the Big Run Bog watershed, wetlands, known cultural resources, and/or residences). Perennial streams were bridged where practicable, and Table III-24 lists proposed bridge locations and lengths by Build Alternative.

Mitigation measures specific to this project are discussed in the 1996 Corridor H FEIS Volume III *Mitigation Document*. General and specific design measures and construction techniques that will be considered for this project include stabilizing stream banks, vegetating eroded areas along stream banks, and continued coordination with resource agencies to utilize a more comprehensive approach to address and remediate the low quality streams present in the Study Area (e.g. Long Run, Middle Run, and Beaver Creek).

The Section 404 Permit, issued in 1996, authorizes activities (including discharges) into jurisdictional surface waters. The permit authorizes these activities through December 2007, and provides a process for extending the approved authorization period. The stream impacts disclosed in the 1996 Section 404 permit were based upon the 1996 OPA. The 1996 OPA crossed the northwestern portion of Big Run Bog's watershed, and did not directly impact the headwater tributaries of Slip Hill Mill Run. As a result of comments received from the NPS in 1997 on the selection of the Preferred Alternative, the WVDOH shifted the OPA outside of the watershed of Big Run Bog. In addition, the avoidance of the Big Run Bog watershed was a requirement of the 2000 Settlement Agreement. The 1998 shift to avoid the Big Run Bog watershed, placed the Build Alternatives for the Parsons-to-Davis Project into the Slip Hill Mill Run watershed. These types of alignment changes are anticipated on complex transportation projects such as Corridor H, and the post-ROD agency coordination process outlined in Volume III of the 1996 FEIS provide for continued agency involvement and concurrence on these types of alignment changes. In addition, the permit terms and conditions allow for disclosure and approval of project modifications. The permit terms will be addressed, as required, as part of the on-going agency coordination process.

Avoidance, Minimization, and Mitigation within Slip Hill Mill Run

While impacts to Slip Hill Mill Run cannot be avoided, the ROPA/Preferred Alternative would result in the least amount of direct impact to the watershed of this sensitive stream because of its landscape position (Figure III-5). In addition, the advanced preliminary engineering conducted on the ROPA/Preferred Alternative during ESA Section 7 consultation to minimize the ROPA's impacts to highly suitable and suitable WVNFS habitat also reduced highway cut and fill encroachments within the Slip Hill Mill Run.

In addition to these minimization efforts:

- The 1996 Corridor H FEIS, Volume III *Mitigation Document* and the 2003 MOU among the FHWA, WVDOH, and the USFS MNF provides an opportunity for resource agencies to participate in office and field reviews during all engineering design phases including final design and to suggest additional mitigation measures.
- Specific erosion and sediment mitigation measures will be developed within the Slip Hill Mill Run watershed during final design.
- West Virginia University began base level and long-term water chemistry, benthic macroinvertebrate, and fish monitoring surveys within Slip Hill Mill Run as required by the *Volume III Mitigation Document* of the 1996 Corridor H FEIS. These data will be utilized to better understand the effects of highway construction, operation and maintenance on native trout streams.

Table III-24
Proposed Bridge Locations and Lengths by Build Alternative

ALTERNATIVE	STATION # (Midpoint)	BRIDGE LENGTH (ft)	CROSSING
1D WEST	88+50	650	US 219 crossing of Corridor H
	992+00	600	Corridor H crossing of unknown tributary of Slip Hill Mill Run
	1155+00	1400	Corridor H crossing of Long Run
	1252+50	1000	Corridor H crossing of US 219
	1338+00	1150	Corridor H crossing of US 219 and North Fork of Blackwater River
	1354+00	700	Corridor H crossing of unknown tributary of North Fork of Blackwater River
	385+50	300	Corridor H Crossing of Pendleton Creek
	56+00	250	Landfill Road crossing of Corridor H
	27+00	250	WV 93 crossing of Corridor H
	ALTERNATIVE 1D WEST TOTAL	6300	
1D EAST	88+50	650	US 219 crossing of Corridor H
	992+00	600	Corridor H crossing of unknown tributary of Slip Hill Mill Run
	1155+00	1400	Corridor H crossing of Long Run
	1252+50	1000	Corridor H crossing of US 219 and Snyder Run
	1338+00	1150	Corridor H crossing of US 219 and North Fork of Blackwater River
	1354+00	700	Corridor H crossing of unknown tributary of North Fork of Blackwater River
	385+50	250	Corridor H Crossing of Pendleton Creek
	434+00	450	Corridor H crossing of Landfill Access Road
	20+00	350	Corridor H Ramp 2 Crossing of Landfill Access Road
	23+50	450	Corridor H Ramp 3 crossing of Landfill Access Road
	443+50	200	Corridor H crossing of WV 93
	ALTERNATIVE 1D EAST TOTAL	7200	
1E	89+50	300	US 219 crossing of Corridor H
	1152+00	1250	Corridor H crossing of Long Run
	1251+50	1250	Corridor H crossing of US 219 and Snyder Run
	1333+50	850	Corridor H crossing of US 219 and North Fork of Blackwater River
	1408+50	500	Corridor H crossing of unnamed road
	1418+00	1050	Corridor H Crossing of Pendleton Creek
	1434+00	450	Corridor H crossing of Landfill Access Road
	ALTERNATIVE 1E TOTAL	5650	
1G WEST	89+50	300	US 219 crossing of Corridor H
	992+50	600	Corridor H crossing of unknown tributary of Slip Hill Mill Run
	1153+00	1000	Corridor H crossing of Long Run
	1245+50	2700	Corridor H crossing of US 219 and Snyder Run
	1291+00	600	Corridor H crossing of US 219
	1314+00	150	Corridor H Crossing of unknown tributary
	1330+50	850	Corridor H crossing of US 219 and North Fork of Blackwater River
	385+50	300	Corridor H Crossing of Pendleton Creek
	55+50	250	Landfill Access Road Crossing of Corridor H
	26+50	250	WV 93 crossing of Corridor H
	ALTERNATIVE 1G WEST TOTAL	7000	

ALTERNATIVE	STATION # (Midpoint)	BRIDGE LENGTH (ft)	CROSSING
1G EAST	89+50	150	US 219 crossing of Corridor H
	992+50	600	Corridor H crossing of unknown tributary of Slip Hill Mill Run
	1153+00	1000	Corridor H crossing of Long Run
	1245+50	2700	Corridor H crossing of US 219 and Snyder Run
	1291+00	600	Corridor H crossing of US 219
	1314+00	150	Corridor H Crossing of unknown tributary
	1329+50	1050	Corridor H crossing of US 219 and North Fork of Blackwater River
	385+50	250	Corridor H Crossing of Pendleton Creek
	433+50	450	Corridor H Crossing of wetlands
	20+50	350	Corridor H Crossing of wetlands
	24+00	450	Corridor H Crossing of wetlands
	443+50	200	Corridor H crossing of WV 93
	ALTERNATIVE 1G EAST TOTAL	7950	
2	87+50	550	US 219 crossing of Corridor H
	64+50	900	US 219 crossing of Corridor H
	1294+50	1000	Corridor H crossing of US 219 and North Fork of Blackwater River
	1388+00	200	Corridor H crossing of WV 32
	ALTERNATIVE 2 TOTAL	2650	
OPA	178+50	1050	Corridor H crossing of Unnamed Tributary to SHMR
	32+00	1200	US 219 crossing of Unnamed Tributary to SHMR
	408+50	1050	Corridor H crossing of North Fork of Blackwater River
	502+50	250	Corridor H crossing of WV 32
	OPA TOTAL	3550	
ROPA/Preferred Alternative	4413+50	1080	Corridor H crossing of North Fork of Blackwater River
	4508+00	300	Corridor H crossing of WV 32
	ROPA/PREFERRED ALTERNATIVE TOTAL	1380	

3.3.6 WILD & SCENIC RIVERS

In 1968, Congress passed the National Wild and Scenic Rivers Act, Public Law 90-542, to preserve and protect wild and scenic rivers and their immediate environments. This act identifies federally administered rivers included in the National Wild and Scenic Rivers System (NWSRS), identifies additional rivers to be studied for possible inclusion in the NWSRS, and provides guidance for the management of rivers within the NWSRS. West Virginia does not have a state level scenic rivers program.

As a result of the National Wild and Scenic Rivers Act, the NPS prepared and maintains the Nationwide Rivers Inventory (NRI) of significant free-flowing rivers. The rivers included in the NRI are presented in the NPS's Final List of Rivers, which includes the Final List of Wild and Scenic Rivers (1979) and the Final List of Recreational Rivers (1981) (www.ncrc.nps.gov/rtca/nri/). Segments of rivers included in the NRI have been identified as meeting the minimum requirements for further study and/or potential designation to the NWSRS.

Three NRI-listed rivers are located near the Study Area, but all eligible segments of these rivers fall outside of the Study Area boundaries. Therefore, the project will have no impact on the status or classification of any NRI-listed rivers.

3.4 CULTURAL RESOURCES

Cultural resources are defined as patterned physical remains of human activity distributed over the landscape through time. Cultural resources are classified as architectural resources (buildings, structures, objects, and districts) and archaeological sites, as defined by the National Register of Historic Places (NRHP) (36 CFR § 60.4). For this study, the Area of Potential Effect (APE), as defined in 36 CFR § 800, is equal to the area within 1,000 feet of each side of any proposed alternative.

3.4.1 SECTION 106 PROCESS

Under the Settlement Agreement, the Amended ROD for the Parsons-to-Davis Project cannot be issued until FHWA and WVDOH have completed all of the studies and consultation required for Section 106 of the National Historic Preservation Act (NHPA) (see Appendix B, Settlement Agreement, p. 34).

Section 106 determinations are being conducted under the terms of the September 1995 Corridor H Programmatic Agreement (Appendix D), which established certain procedures that must be carried out for all Section 106 studies for Corridor H. Consultation under the Programmatic Agreement involves the steps shown in Figure III-6.

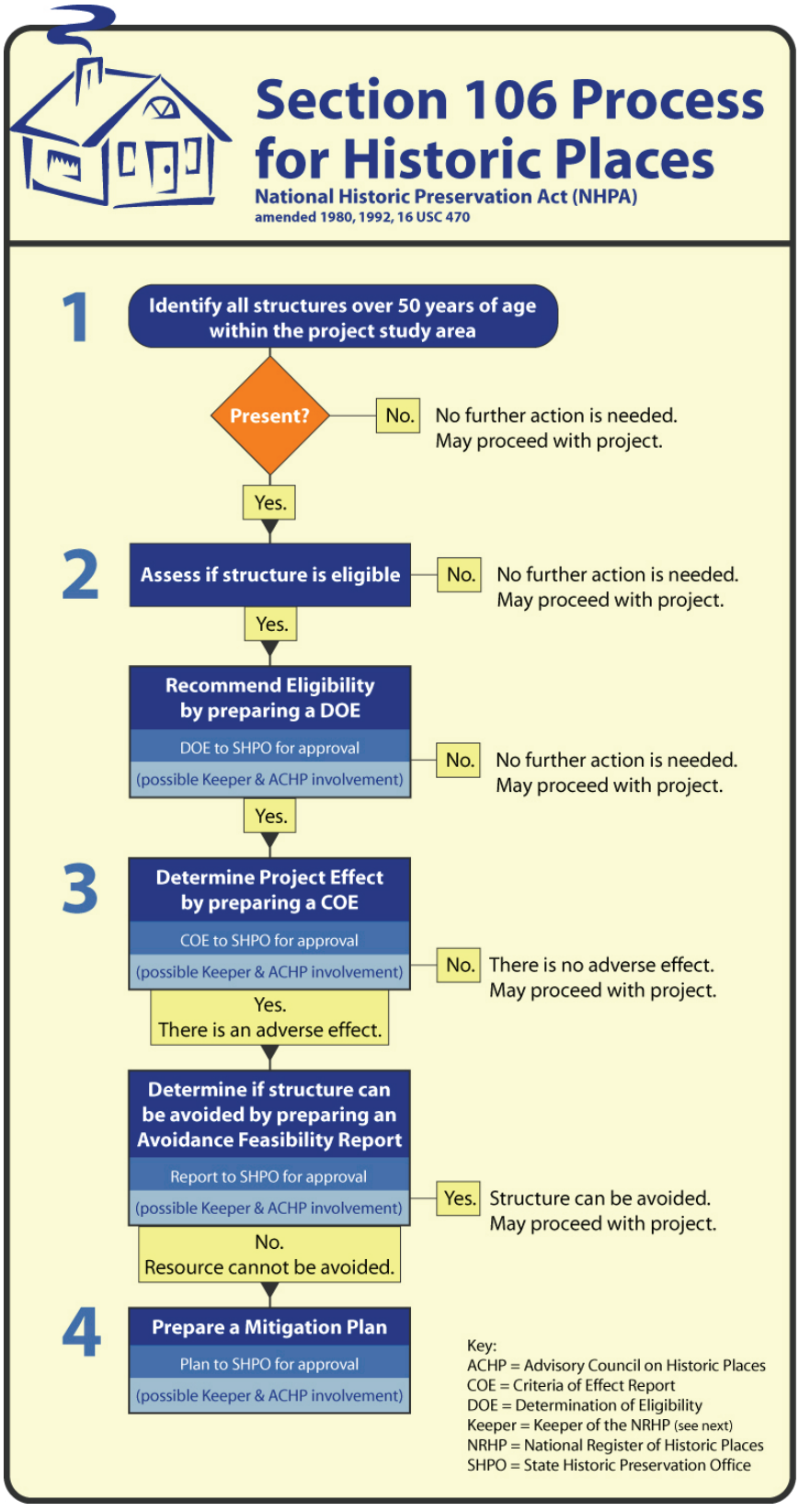

Figure III-6
Section 106 Process for Historic Places Under Corridor H Programmatic Agreement

3.4.2 KNOWN AND EXPECTED CULTURAL RESOURCES IN THE STUDY AREA

An extensive historical context of the Study Area was presented in the technical appendices to the 1994 Corridor H ASDEIS, supplemented by the historical context found in the 1999 Determination of Eligibility (DOE) Report incorporated here by reference. Further detail regarding the resources mentioned below can be found in the Section 4(f) analysis, *Section IV* of this SFEIS.

Consultation History

WVDOH and FHWA consulted with the West Virginia State Historic Preservation Office (WVSHPO), as required by Section 106 of the National Historic Preservation Act, on Corridor H on a section-by-section basis. At the time of the SDEIS, the Parsons-to-Davis section was the final section that required evaluation. In June 2002, a draft Criteria of Effects (COE) Report was circulated. The Draft COE Report found that the Parsons-to-Davis Project would have "no effect" on the Blackwater Industrial Complex Archaeological and Historic District (Blackwater Industrial Complex). The WVSHPO, United States Forest Service Monongahela National Forest (USFS MNF), and Corridor H Alternatives (a plaintiff in the lawsuit), which were all consulting parties in the Section 106 process, submitted comments on the Draft COE Report as follows:

- In a letter dated October 30, 2002, WVSHPO found that the project would have "no adverse effect" on the Blackwater Industrial Complex. The WVSHPO commented, however, that the evaluation should focus on "the relative change" to the district, rather than the Draft COE Report's evaluation of the percentage of the district that would experience visual or noise impacts.
- In a letter dated July 26, 2002, the USFS MNF expressed concerns related to Project's potential visual, auditory, and physical impacts on the Monongahela National Forest. Following the receipt of the USFS MNF comments, in October 2002, the USFS MNF, WVDOH, and FWHA executed a Memorandum of Understanding (MOU) that included measures to mitigate these potential effects. In a letter dated October 24, 2002, the USFS MNF found that the project would have no adverse effect on historic resources within the Monongahela National Forest.
- In a letter dated December 12, 2003, counsel for Corridor H Alternatives disagreed with the Draft COE Report's finding of "no effect," and recommended a finding of "adverse effect" based on visual and auditory effects to the historic district and its setting.

On March 23, 2004, the Final COE Report was submitted to the WVSHPO for review and concurrence and to the USFS MNF and Corridor H Alternatives for comments, in accordance with the September 1995 Section 106 Programmatic Agreement for Corridor H (Appendix B). WVDOH and FHWA received comments on the Final COE Report as follows:

- In a letter dated June 23, 2004, the WVSHPO affirmed its earlier opinion that the Parsons-to-Davis Project would have "no adverse effect" on the Blackwater Industrial Complex. The WVSHPO stated that the "historic nature of the site will not adversely change" as a result of the project and that the proposed bridge "will not adversely effect" the interpretation of the physical remnants of the site.
- In a letter dated April 14, 2004, the USFS MNF concurred with the findings of the Final COE Report. The USFS MNF letter stated that the Parsons-to-Davis Project "would have no effect to contributing elements of the District, and recommend[ed] that project activities proceed as planned."
- Corridor H Alternatives did not submit comments on the Final COE Report.

On May 13, 2004, at the request of Advisory Council on Historic Preservation (ACHP) staff, FHWA transmitted a copy of the Final COE Report to the ACHP, and requested concurrence from the ACHP with the Final COE Report's "no adverse effect" finding.

3.4.2.1 Historic Resources

Phase I and II investigations of architectural resources presented in the 2000 DOE indicated that only one building, structure, object, or district was located within the Study Area. The West Virginia State Historic Preservation Office (WVSHPO) and the Keeper of the NRHP concurred that the West Virginia Central and Pittsburgh (WVC&P) Railway (Resource BW-019) was the only historic property in the Study Area (Exhibit III-6). In a Determination of Eligibility Notification dated January 17, 2001, the Keeper reiterated its finding that the WVC&P Railway was eligible for the NRHP under Criteria A and C as a "discontiguous historic district" (Appendix A). Also within this correspondence, the Keeper found that a stone arch bridge near the community of William appeared to be the only contributing element for this portion of the discontiguous historic district.

Additionally, during investigations of the OPA, three archaeological sites were identified. All three are located in the Blackwater Area and are related to the historic colliery at Coketon (Figure III-7). The Keeper of the NRHP has determined that the entire Coketon study area is a contributing component of the continuous Blackwater Industrial Complex Archaeological and Historic District (Blackwater Industrial Complex) (Exhibit III-6). The Blackwater Industrial Complex was found eligible for the NRHP under criteria A, B, C, and D (Keeper's Eligibility Determination, August 2, 2001, in Appendix A). Because the Big Run Bog shift, TCHS connection and Truck Route are all located within the APE, any resources that might have been impacted by these ROPA changes would have been identified in the Section 106 process.

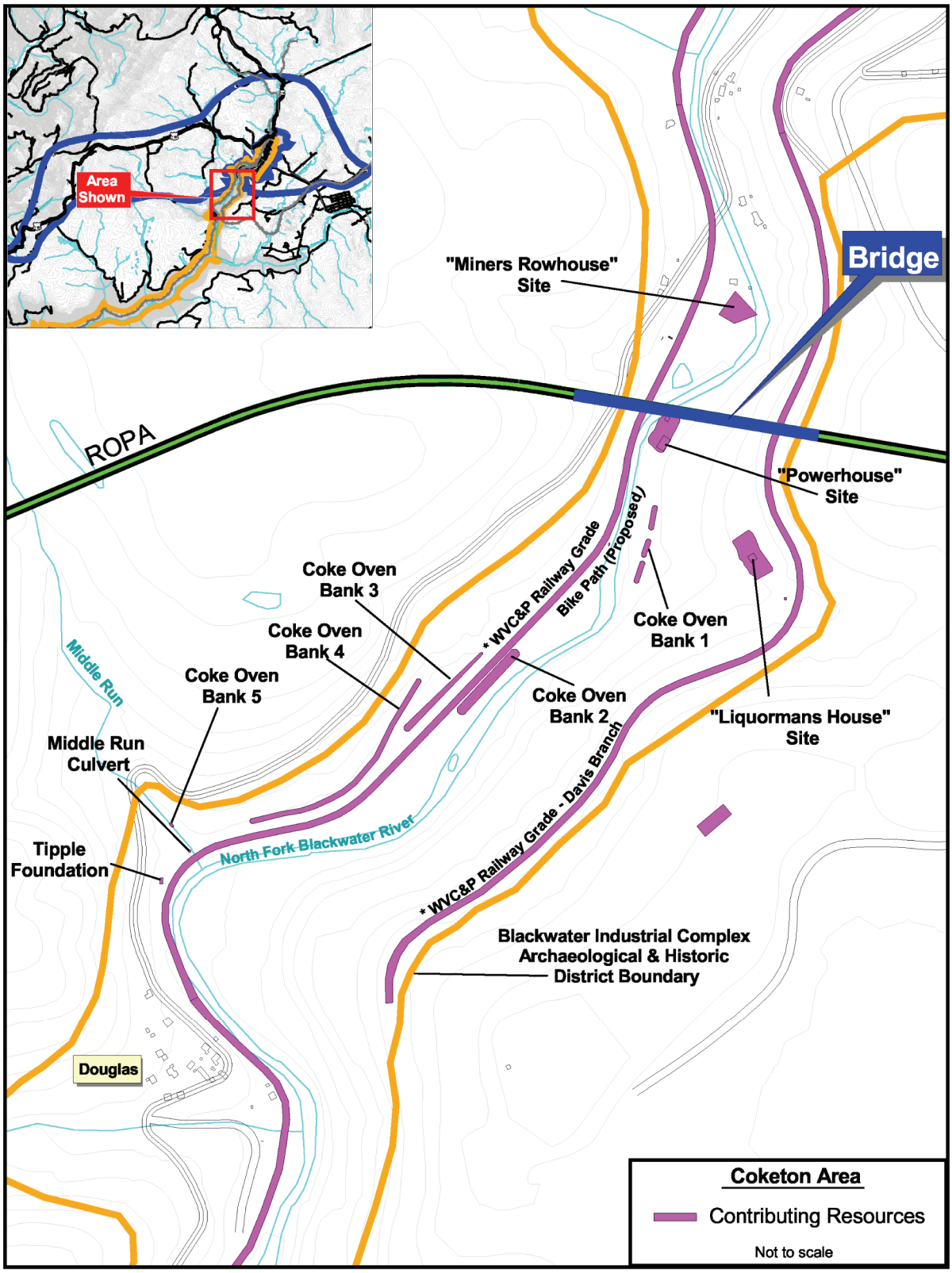

Figure III-7
Coketon Area

3.4.2.2 Prehistoric Predictive Model

An extensive prehistoric context regarding the Corridor H Study Area, including the Parsons-to-Davis Study Area, was prepared and presented in the 1995 Corridor H ASDEIS *Cultural Resources Technical Report*, which is incorporated here by reference. In addition, a Prehistoric Predictive Model was developed for Corridor H and employed to identify areas of high to low probability for the presence of prehistoric sites. The Prehistoric Predictive Model was presented in a 1994 report (Johnson *et. al.*, 1994), which is also incorporated here by reference. This synchronic prehistoric predictive model was based on a variety of factors. These factors included: the results of previous archaeological surveys; the distribution of previously recorded archaeological sites in the vicinity of the Corridor H Study Area; previously proposed regional predictive models; and physiographic, geologic, hydrologic, and topographic factors. The model was field tested for verification (and presented in the 1994 Corridor H ASDEIS *Cultural Resources Model Test Report*) before it was implemented along the entire length of Corridor H.

The Prehistoric Predictive Model has been applied to the Parsons-to-Davis Study Area. Archaeological data gathered in the general project vicinity during previous Corridor H archaeological investigations (1996 through the present) were also used to refine the model. The prehistoric probability zones were plotted onto project mapping. Once the alternatives were finalized, the total area of each probability zone, per alternative, was calculated.

The acreage of high and medium probability areas for prehistoric resources potentially impacted by each alternative is presented in Table III-25. Because the locations of archaeological sites are protected to prevent unlawful collection of artifacts, an illustration of the probability areas is not included here but have been provided to the WVSHPO.

3.4.3 POTENTIAL IMPACTS

3.4.3.1 Historic Resources

WVC&P Railway

None of the Blackwater Alternatives would impact the WVC&P Railway. North of Thomas, the WVC&P Railway would be crossed by the Blackwater Avoidance Alternatives (1D East and West, 1E, and 1G East and West) (Exhibit III-6). However, none of the proposed alternatives take any land from within the historic boundaries of the WVC&P Railway. Additionally, the stone arch bridge is not located within the APE for any of the alternatives. Therefore, the project will not affect the resource.

Blackwater Industrial Complex Archaeological and Historic District (Blackwater Industrial Complex)

The Blackwater Industrial Complex would be crossed by the ROPA/Preferred Alternative, the OPA or Alternative 2 (Exhibit III-6). The Blackwater Avoidance Alternatives (1D East and West, 1E, and 1G East and West) all pass north of the Blackwater Industrial Complex; therefore, would have no effect on the resource.

A final Criteria of Effects (COE) report was prepared for this resource in accordance with the 1995 Programmatic Agreement developed for the Appalachian Corridor H Project under Section 106 of the NHPA. The COE was provided to resource agencies and stakeholders in March 2004 after a draft version had been circulated and comments on the draft had been addressed. The final COE report addressed specifically the potential effect of the selected Preferred Alternative, the ROPA. The final COE report is incorporated here by reference, and its findings are summarized below.

The final COE report was prepared in accordance with 36 CFR § 800 and specifically evaluated: 1) the effect of the ROPA/Preferred Alternative on the Blackwater Industrial Complex, and 2) the impacts specific to the area immediately adjacent to the bridge crossing (Coketon study area). The methodology used in assessing the potential impacts was based on the type of impact: direct physical, visual, auditory, or induced development in land use. Each type of impact and its methodology for evaluation is described in the COE report.

The ROPA/Preferred Alternative (but also the OPA and Alternative 2) will cross the National Register boundary of the Blackwater Industrial Complex on structure. The structure will be designed with piers located in the historic boundary; however, those piers will be designed so that property that is individually eligible (e.g., WVC&P Railway grade) will not be directly impacted by the piers. Nor will property be used that contributes to the district's historic significance (i.e., contributing resources).

After the analyses were conducted for the final COE report, it was concluded that the project will have an effect but not an adverse effect on the Blackwater Industrial Complex. This finding is based on the following considerations:

- the piers of the bridge will be confined to non-contributing areas, and thus there will be no physical impacts on any contributing elements of the district;
- the bridge will be visible, but the view of the bridge will not adversely affect any contributing element of the district, because the current setting (forested, quiet, and rural) is not a contributing element of the district;
- the increased noise levels resulting from the presence of the bridge will not adversely affect the resource because the current quiet setting is not a contributing element of the district; and
- the project will not cause induced development in the Blackwater Industrial Complex, due to a lack of direct access; the fact that much of this area is owned and managed by the USFS MNF; and the topography of the area.

Through the Section 106 consultation with the WVSHPO and the other consulting parties under the Programmatic Agreement, WVSHPO determined that the project as planned would have no adverse effect on the Blackwater Industrial Complex (see letters dated June 23, 2004 and October 30, 2002, in Appendix A). Additionally, the USFS MNF concurred with the findings of the final COE report in a letter dated April 14, 2004 (Appendix A).

Section IV of this SFEIS includes a Section 4(f) analysis for the proposed project. This analysis concludes that no resources eligible for protection under Section 4(f) will be directly or constructively used by any of the Build Alternatives.

3.4.3.2 Archaeology Investigations

The No-Build Alternative would not impact archaeological resources within the Study Area. Preliminary impacts associated with the Build Alternatives were evaluated using the project's Prehistoric Predictive Model.

The ROPA/Preferred Alternative will impact 0.7 acres of high and 7.7 acres of medium probability areas. Of all the alternatives carried forward for detailed analysis, Alternative 1E will impact the greatest combined acreage of high and medium probability areas (16.2 acres), as well as the greatest acreage of high probability area alone (11.1 acres). Alternative 1G East will impact the least combined high and medium acreage (2.8 acres) and the least of high probability area alone (0.3 acres).

The ROPA/Preferred Alternative, the OPA and Alternative 2 will each have relatively few impacts to high probability areas when compared to the Blackwater Avoidance Alternatives (except 1G East); however, potential impacts to medium probability areas by these alternatives are essentially the same as those by the Blackwater Avoidance Alternatives.

Table III-25
Potential Impacts to Prehistoric Probability Areas (acres)

Prehistoric Probability Area	1D West	1D East	1E	1G West	1G East	OPA	2	ROPA/ Preferred Alternative
High Probability	7.9	5.5	11.1	2.7	0.3	1.4	0.5	0.7
Medium Probability	6.8	6.8	5.1	2.5	2.5	7.0	5.8	7.7

Phase I archaeological investigations have been conducted for the ROPA/Preferred Alternative. No potentially significant archaeological resources were found; WVDOH received concurrence from West Virginia Division of Cultural and History (WVDCH) in a letter dated February 17, 2005 (see Appendix A).

3.5 PHYSICAL ENVIRONMENT

3.5.1 GROUNDWATER RESOURCES

Groundwater resources have been evaluated in accordance with FHWA's Technical Advisory T 6640.8A. This discussion focuses on three groundwater topic areas: private wells, springs, and karst topography. These topics are discussed in the 1996 Corridor H FEIS. Sources for information in this assessment include the West Virginia Geologic and Economic Survey (WVGES), United States Geological Survey (USGS), WVDEP, the West Virginia Department of Health and Human Resources (WVDHHR), and the Tucker County Health Department.

The Study Area is primarily located in remote areas with populations centralized in five neighborhoods: Benbush, Coketon, Davis, Thomas, and William. Municipal public water service covers the communities of Benbush, Coketon, Davis, and Thomas. William is dependent on private wells.

3.5.1.1 Private Wells

Well locations and additional data regarding well construction and bedrock units were obtained from the USGS National Water Information System, USGS publications, the Tucker County Health Department, and field observations. Water quality data concerning private wells is described according to the geologic formation or rock units into which the wells were installed.

USGS 7.5 minute topographic maps were used to estimate the number and location of residences that are identified as being within a potential impact zone. The potential impact zone criteria are residences that are outside of public water service and within 500 feet of the estimated construction limits of the alternatives carried forward for detailed analysis.

Because these are private residences that typically have low production volumes, the 500-foot distance is based upon the minimum pumping capacity fixed radius used by the WVDHHR for Source Water Assessment and Protection Program (WVDHHR, 1999) for community wellhead protection. In addition, well impacts were assumed to occur when relocations of residences that are not currently served by a known public water supply would be required.

A description of the geology of the Study Area is included in the 1996 Corridor H FEIS, which is incorporated into this SFEIS by reference, and is summarized in *Section 3.5.2 Geology, Mines and*

Minerals of this SFEIS. Wells in the Study Area are typically installed in the first water bearing rock formation encountered during well drilling. These wells may be installed within the Conemaugh, Allegheny Pottsville, Mauch Chunk and Greenbrier Groups.

Potential Impacts

The No-Build Alternative would not impact groundwater resources. All of the Build Alternatives would have similar minimal impacts on groundwater resources. Most of the Study Area populations are covered by public water service. Potential impacts and available local residential well information are presented below:

- William, West Virginia is dependent on the Conemaugh Group for groundwater. Seven residences are reported, just south of William, beyond the Thomas PSD water service in the Study Area. Well logs on file with the Tucker County Health Department had an average depth of 102 feet (ranging between 35 and 147 feet) and an average potential production rate of 14 gallons per minute (gpm) (ranging between 1.25 and 45 gpm). Water quality is moderately hard with low levels of iron, dissolved solids and chlorine. Water production for the formation is moderate to good, depending on formation exposure for recharge (Reger, 1924, Schwietering, 1981 and Ward, 1968a/b). These wells are north of any of the Build Alternatives' (carried forward for detailed analysis) potential impact zones.
- The Tucker County Health Department reported one well in the Conemaugh/Allegheny formations in Thomas. The well is 260 feet deep and was reportedly for a concrete batch plant. This well is outside any of the Build Alternatives' (carried forward for detailed analysis) potential impact zones.
- Four wells were reported by the USGS in the immediate vicinity of TCHS. Seven to ten residences are shown beyond the public water service in the Study Area, just south of William, WV. Well logs on file with the Tucker County Health Department had an average depth of 344 feet (ranging between 197 and 650 feet) screened in the Pottsville and Mauch Chunk formations. Water production from these formations is high in the Pottsville Group (especially when overlain by the Conemaugh/Allegheny formations) and low in the Mauch Chunk Group. Water quality is soft with high to moderate levels of iron and chlorine, and low levels of dissolved solids and chlorine (Reger, 1931, Schwietering, 1981, and Ward, 1968). The statuses of these wells are unknown, but may be no longer in service, with the expansion of the Thomas PSD water service along the route to TCHS. One or more of these wells are within the 500-foot potential impact zone of the ROPA/Preferred Alternative and the OPA. The wells are outside the remaining Build Alternatives' (carried forward for detailed analysis) potential impact zones.

Avoidance, Minimization, and Mitigation

The alternative development process included efforts to avoid or minimize impacts to groundwater resources. The following mitigation measures could be used during final design and construction of the proposed alternatives to monitor impacts to existing wells:

- Any wells that would be lost due to construction activities would be replaced, as necessary, through WVDOH's ROW acquisition process. Wells would be properly abandoned and sealed in accordance with standards set by current regulations.
- Wells that are within 500 feet of the ROPA/Preferred Alternative will be monitored before, during, and after construction to identify any changes in water quality during construction activities. If substantial changes in water quality or quantity occur, these wells would be replaced.
- If necessary, existing public water supply lines could be extended to service areas where several residences are within the potential impact zone.

3.5.1.2 Springs

The location and evaluation of springs were based upon literature searches of the WVGES, the USGS, and the Tucker County Health Departments. There is one spring reported within the Study Area: the Close Mountain Spring located near Long Run about three miles west of Benbush, West Virginia. The spring issues from the hillside exposure of the Mauch Chunk Group Mississippian shale and sandstones at a rate of about 4 gpm (McColloch, 1986).

Potential Impacts

The No-Build Alternative and the Blackwater Alternatives would not impact springs. The Close Mountain Spring is over 500 feet northwest of US 219 and over 1,000 feet north of the Blackwater Avoidance Alternatives. The spring is recharged from waters flowing from the northwest, within the Mauch Chunk Group, from under the Backbone Mountain region. Impacts to the spring are not anticipated above those existing from the current US 219 and nearby Long Run strip mine.

Avoidance, Minimization, and Mitigation

Mitigation measures are not required. If additional springs are discovered during final design and construction, the appropriate monitoring measures will be conducted, if appropriate. Springs that are within 500 feet of the ROPA/Preferred Alternative will be monitored before, during, and after construction to identify any changes in water quality during construction activities.

3.5.1.3 Karst Topography

There are no surface expressions of karst topography in the Study Area.

3.5.1.4 Secondary Impacts on Groundwater Resources

The proposed roadway construction would increase the amount of impervious cover in the watersheds. While this would slightly increase storm-water runoff volumes and peak discharges, no long-term impact to the quantity of groundwater would be expected. The area covered by the highway pavement would be small in comparison to the overall land available for recharge. Therefore, no significant impact on groundwater is expected due to highway construction.

3.5.1.5 Public Water Supply

Impacts to sole-source aquifers have been evaluated in accordance with 40 CFR § 149. The municipalities served by, and the sources of, public drinking water supplies were identified based on published River Basin Plans for the Potomac and Monongahela Rivers, as well as on direct communications with state, county, and local officials. Public water supply systems were identified for Davis and Thomas. For each public water supply identified, the approximate location of the source or system intake and the distribution/service area were identified on project GIS, as shown on Exhibit III-7.

Identification and protection of sole source aquifers and wellhead protection areas are required by the Safe Drinking Water Act of 1986. Wellhead protection areas are defined in the Act as "the surface and subsurface area surrounding a water well or wellfield supplying a public water system through which contaminants are reasonably likely to move toward or reach such well or wellfield" (USEPA, 1987).

Existing Conditions

The WVDHHR verified that sole source aquifers or wellhead protection areas were not reported within the Study Area.

Two public water supplies were identified within the Study Area: the Davis and Thomas Public Service Districts (PSDs). Both PSDs obtain their water supply from surface water. The service areas and intakes are shown on Exhibit III-7.

The Davis PSD is located 0.6 mile east of Davis on the Blackwater River. The facility was installed in 1976 and rebuilt in 1985, following a severe flood. The Davis PSD has intakes on the Blackwater River and from a reservoir behind Weiner's Dam south of the river. The primary water source is from the Blackwater River intakes. The Weiner's Dam intakes, located on a small tributary that flow into the Blackwater River, provide supplemental capacity during peak usage or equipment maintenance. The water is piped to a treatment facility located on the north side of the river. Treatment includes sediment basins, filtration, and chlorination. Water production varies greatly due to the summer tourist demand from the Blackwater Falls State Park and Lodge, and associated campgrounds.

The Thomas PSD is located 0.4 mile north of Thomas. The PSD collects water from the City of Thomas Reservoir, 1.2 mile north of Thomas, southeast of William and east of US 219. Water is piped 0.8 mile from the reservoir to a treatment building located east of the Blackwater River. Treatment performed at the facility includes filtration and chlorination.

Potential Impacts

The No-Build Alternative would not impact public water supplies within the Study Area. Potential environmental impacts to the two public water supplies were evaluated for each of the Build Alternatives. The Build Alternatives cross the Beaver Creek and the Blackwater River system downstream of the Thomas and Davis PSDs intakes. Potential impacts to the Thomas and Davis PSDs are not anticipated because both the intakes and recharge areas are upstream of the Build Alternatives. The public water supplies' geographical relationships to the proposed alternatives are presented on Exhibit III-7.

3.5.2 GEOLOGY, MINES & MINERALS

To gain an understanding of the potential impacts to geology, mines and minerals associated with the proposed project, a literature search of state and federal sources was conducted. Sources included reports, databases, files, maps, and interviews with the WVGES, the USGS, the WVDEP – Division of Mining and Reclamation, the WVDEP - Abandoned Mine Lands and Reclamation (AMLR), the United States Department of the Interior (DOI) - Office of Surface Mining (OSM), West Virginia Office of Miner's Safety and Training (WVOMST), and knowledgeable local citizens.

3.5.2.1 Existing Conditions

The Study Area is within the Appalachian Plateau Province and the Black Fork Local Project watershed, which is part of the Cheat River Regional Project Watershed within the Monongahela River basin. The Study Area is predominantly covered with the Dekalb-Brinkerton soils, which are from acid sandstone and shale parent materials with strong to extreme acid content (USDA, 1967). Sedimentary rocks become progressively older from Upper Pennsylvanian age bedrock in the Thomas area, to Mississippian age bedrock to the east, west and south within the large North Potomac (George's Creek) Syncline. The Upper Freeport coal seam slopes (dips) an average of 25 degrees northeast along the syncline axis from Coketon to Thomas. A generalized geologic map of the Study Area is presented in Figure III-8.

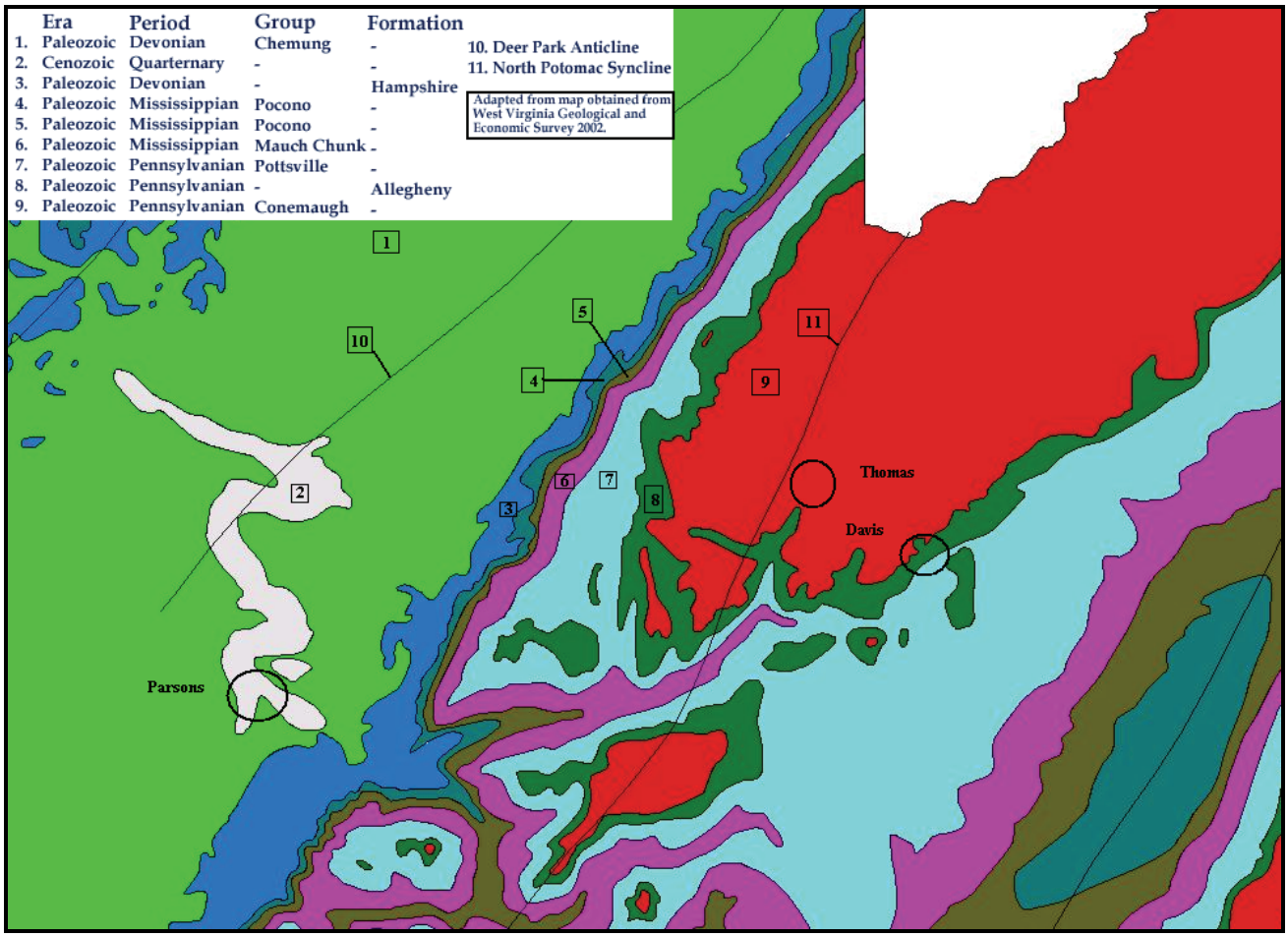

Figure III-8
Generalized Geologic Map of the Study Area

The following groups underlie the Study Area with exposures in descending order to the south of the Study Area:

- Conemaugh Group – Pennsylvanian - cyclic red and gray shale, siltstone and sandstone, with thin limestones and coal seams. The formation is generally 430 feet thick (Cardwell, 1986).
- Allegheny Group – Pennsylvanian – cyclic sandstone, siltstone, shale, limestone and coal. The formation is generally 150 feet thick. Commercial coal production has been restricted to the Upper Freeport coal, which has been extensively mined both at the surface and underground (Reger, 1923).
- The Pottsville Group – Pennsylvanian - primarily conglomeratic sandstones with thin shales and coals.
- Mauch Chunk Group – Mississippian - red, green, and medium-gray shale and sandstone, with few thin limestones; coal is absent, and the unit is largely barren of valuable deposits (Reger, 1923).
- Greenbrier Group – Mississippian – marine limestone and marine/non-marine red and gray shale, and minor sandstone beds, coal is absent, and, while the unit is known for the presence of both springs and caves, none are reported within the Study Area (Cardwell, 1986, Davies, 1965, Reger, 1923).

Coal Mining

The Bakerstown and Upper Freeport coal seams have been extensively mined near the communities of Davis, Thomas, Benbush and Coketon. Underground (deep) mining in the Bakerstown coal seam extends from Douglas to about 0.6 mile north of Thomas, and from Benbush to Chaffey Run east of the Study Area. Surface mining extends along outcrops in the Pendleton Creek, Long Run, Synder Run, Beaver Creek, Lost Run and the North Fork of Blackwater River valleys across the southern portion of the Study Area and north to Thomas and Benbush. Extensive underground (deep) mining in the Upper Freeport covers the central portion of the Study Area from Douglas to Pierce and from Long Run to Davis and the east side of Thomas. Surface mining extends along Long Run, Beaver Creek, the North Fork of Blackwater River, and outcrops west of Benbush and west of Davis.

The DOI, OSM and WVDEP records identify 28 coal-mining locations in the Study Area. These records were reviewed in January 2006 to determine if permit changes have occurred in the Study Area. The records were also reviewed to determine if new permits have been issues since the December 2002 SDEIS. While no new permits have been issued (for new sites) there have been some status modifications to existing sites. The updated information is included in Table III-26. Mines permitted by the WVDEP are shown on Exhibit III-8. The current mine permits are listed in Table III-26.

Table III-26
Issued Mine Permits

Permit	Type	Location	Issued Date	Current Status
O004583	Haul Road	1.3 km (0.8 mi.) Southwest of Thomas on WV 93	8/21/01	Done/Phase 3 Released
O200695	Haul Road	0.5 km (0.3 mi.) Southwest of WV 93, West of Davis	2/5/96	Active/Renewed
S000780	Surface	1.8 km (1.1 mi.) East of Thomas, Pendleton Creek	9/7/04	Done/Phase 3 Released
S007379	Surface	0.5 km (0.3 mi.) Southwest of WV 93, Pendleton Creek	7/18/05	Done/Phase 3 Released
S007476	Surface	1 km (0.6 mi.) Southwest of WV 93, West of Davis	6/23/05	Done/Phase 1 Released
S014677	Surface	0.5 km (0.3 mi.) Southwest of WV 93, Pendleton Creek	9/14/02	Renewal Waiver
S201892	Surface	1 km (0.6 mi.) Southwest of WV 93, West of Davis	7/18/05	Done/Phase 3 Released
S202392	Surface	0.2 km (0.1 mi.) Southwest of WV 93, Northwest of Davis	4/1/93	Inactive/ Renewed
S200595	Surface	1 km (0.6 mi.) Southwest of Benbush, West of Davis	1/31/96	Never Started/ Renewed
U200389	Underground	East of Benbush and North of WV 93	4/21/03	Done/Phase 3 Released
Q002574	Quarry	West of Benbush	3/1/74	Active/Renewed
Q004078	Quarry	West of TCHS	3/28/78	Active/Renewed

Source: WVDEP, 2006.
Note: All Permits issued to Buffalo Coal Co. except the Quarries permits issued to Stanley Industries, Inc.

The coal mining industry makes a low-level economic contribution to the Study Area and Tucker County (Harris, 1999). In 1998, the coal mining industry employed 55 people, just 0.3 percent of the population of Tucker County. It produced 179,000 tons of coal from surface mines, 76,000 tons of limestone, and 550 tons of shale in Tucker County in that same year (Harris, 1999). There are reported to be 178 million tons of recoverable coal reserves in Tucker County (West Virginia Coal Association, Inc., 2002).

The area around Thomas has been particularly susceptible to mine subsidence in the past. Because of the documented occurrences of subsidence and the extensive network of underground mines, the entire Study Area is considered subsidence-prone for the purposes of this SFEIS. No sources indicate the presence of mine fires in the Study Area.

Acid Drainage

Acid drainage is a low pH (acidic), sulfate-rich water. Acid drainage results from the oxidation of metal disulfide minerals upon exposure to air and water. Numerous mine seeps producing acid-drainage have been identified by the AMLR in the Study Area. Because of the geologic composition and the known seeps, the entire Study Area is considered prone to acid drainage.

Natural Gas and Oil

WVDEP records report an exploratory natural gas well (#093-00067) 0.6 mile northeast of Thomas and 0.3 mile east of US 219. The records indicate it was never viable and no other wells are reported in the Study Area.

Sandstone and Limestone Quarries

The Stanley and Fairfax quarries are located north of US 219 and are well outside of any of the potential impact zones of the Build Alternatives carried forward for detailed analysis.

Mineral Resources

The Conemaugh and Allegheny Formations are listed as having favorable geology for sandstone uranium. The Conemaugh Formation is also favorable for sediment-hosted copper. However, no occurrences of sandstone uranium or sediment-hosted copper are reported in the Study Area. In addition, there are no deposits that indicate profitable production of these minerals either now or in the foreseeable future (Cannon *et al.*, 1994 and Reger, 1923).

Karst Topography

There are no surface expressions of karst topography in the Study Area.

Unique Geologic Features

There are no known unique geologic features in the Study Area.

3.5.2.2 Potential Impacts

Because the entire Study Area is considered prone to subsidence, all of the Build Alternatives carried forward for detailed analysis are considered to have an equal potential to encounter subsidence. The No-Build Alternative will not encounter subsidence.

Because most of the Study Area is considered prone to acid-drainage, all the Build Alternatives carried forward for detailed analysis are considered to have an equal potential to produce acid drainage.

3.5.2.3 Avoidance, Minimization & Mitigation

Specific avoidance, minimization, and mitigation measures regarding subsidence are detailed in the 1996 Corridor H FEIS (p. III-237) and are incorporated here by reference. The potential for acid drainage as a result of project construction and appropriate avoidance, minimization, and mitigation

measures are detailed in the 1996 Corridor H FEIS, Volume III *Mitigation Document* (pp. 22 – 25) and are incorporated here by reference (WVDOT, 1996).

3.5.3 HAZARDOUS MATERIALS

The hazardous materials analysis has been conducted in accordance with WVDOT's *Guidelines for Identifying and Dealing with Hazardous Waste on Highway Projects* (WVDOT, 1989) and the guidelines set forth in FHWA's Technical Advisory T 6640.8A (FHWA, 1987), and *Interim Guidance: Hazardous Waste Sites Affecting Highway Project Development* (FHWA, 1988).

Several federal programs regulate hazardous waste sites. These programs include the Resource Conservation and Recovery Act (RCRA), the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA [or Superfund]), and the Superfund Amendments and Reauthorization Act (SARA). These federal laws give USEPA responsibility for regulating hazardous waste. In response to this directive, USEPA is inventorying uncontrolled sites and has published the National Priority List (NPL).

Appropriate data collections and coordination with local, state and federal agencies was undertaken to determine the location of known permitted and non-regulated hazardous waste sites within the Study Area. During the 1994 Corridor H ASDEIS and 1996 Corridor H FEIS stages of the Corridor H Project, letters of inquiry were sent to the West Virginia Division of Waste Management to obtain information regarding countywide lists of hazardous waste sites. Background data searches were also conducted at the ASDEIS and FEIS stages. This information has been updated for the purposes of this SFEIS and was confirmed through field reconnaissance of the Study Area.

3.5.3.1 Existing Conditions

The Study Area is largely comprised of surface and underground mining operations (recent and historical), wetland complexes, and forest. Commercial development is mostly limited to properties with direct access from US 219 and WV 93, including the City of Thomas. The City of Thomas is located within the Blackwater Area defined in the 2000 Settlement Agreement (Appendix B). Potential small-scale hazardous waste generators, such as gas stations (operational and abandoned) and dry cleaners, are also located within this area and along US 219. An abandoned gas station is located in the extreme northern portion of the Study Area, near William on WV 90.

Historically, municipal waste was disposed in "dumps" such as old strip-mining areas. Two of these historic "dumps" are located in the Study Area: the Benbush Refuse area and the Tire Dump. The extent of the Tire Dump was not previously documented, so its extent was delineated by a field evaluation of the existing terrain and other natural features. The old Tucker County dump was located south of Pendleton Creek, but its contents were reportedly removed when mining operations resumed in the area in the late 1980s.

Immediately southeast of Thomas is the Tucker County Landfill (TCL). The landfill is permitted for municipal waste disposal and may accept certain types of "special solid waste" (e.g., shredder fluff, insulation, ash, and drums). "Hazardous wastes" as defined by WVDEP and USEPA are not accepted at the TCL. All potential hazardous waste sites are shown in Exhibit III-8.

Environmental Data Resources, Inc. performed a background data search for the Study Area in June 2002. Table III-27 presents the number of listed hazardous waste facilities within the Study Area.

Table III-27
Potential Hazardous Waste Sites in Study Area

Government Reporting Database		Source Agency	# of Potential Sites in Study Area
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System	USEPA	0
NPL	National Priority List	USEPA	0
ERNS	Emergency Response Notification System	USEPA/NTIS	0
RCRIS	Resource Conservation and Recovery Information System	USEPA/NTIS	1
CORRACTS	Corrective Action Report	USEPA	0
BRS	Biennial Reporting System	USEPA/NTIS	0
CONSENT	Superfund (CERCLA) Consent Decrees	USEPA Regional Offices	0
FINDS	Facility Index System/Facility Identification Initiative Program Summary Report	USEPA	1
HMIRS	Hazardous Materials Information Reporting System	USDOT	0
MLTS	Material Licensing Tracking System	Nuclear Regulatory Commission	0
NPL LIENS	Federal Superfund Liens	USEPA	0
PADS	PCB Activity Database System	USEPA	0
RAATS	RCRA Administrative Action Tracking System	USEPA	0
ROD	Records of Decision	NTIS	0
TRIS	Toxic Chemical Release Inventory System	USEPA	0
TSCA	Toxic Substances Control Act	USEPA	0
MINES	Mines Master Index File	Dept. of Labor, Mine Safety and Health Administration	4
LUST	Leaking Underground Storage Tanks	Division of Environmental Protection	0
SHWS	State Hazardous Waste Sites	Dept. of Commerce, Labor and Environmental Resources	0
LF	List of M.S.W. Landfills/Transfer Station Listing	Division of Environmental Protection	0

Government Reporting Database		Source Agency	# of Potential Sites in Study Area
UST	UST Database	Division of Environmental Protection	0
DELISTED NPL	NPL Deletions	USEPA	0
NFRAP	No Further Remedial Action Planned	USEPA	0
PWS	Public Water Systems	USEPA/Office of Drinking Water	1
FTTS	FIFRA/TSCA Tracking System	USEPA/Office of Prevention	1

Source: Environmental Data Resources, Inc.

3.5.3.2 Potential Impacts

The West Option of Alternatives 1D and 1G involves the use of property currently used by the TCL. However, this section of property is where the access road and scales are located, and hazardous wastes are not expected to exist in this area. None of the other alternatives carried forward for detailed analysis are expected to directly impact known potential hazardous waste sites. The ROPA/Preferred Alternative would not result in any direct impacts to known hazardous waste sites.

3.5.3.3 Avoidance, Minimization, & Mitigation Measures

WVDOT's hazardous waste guidelines state that it is WVDOT practice to avoid known hazardous waste sites (WVDOT, 1989). Avoidance of hazardous waste facilities is often the most practical alternative due to the potential costs of handling, sampling, treatment, storage, and transportation and disposal of these materials. Because no hazardous waste sites are located within the construction limits of the alternatives carried forward for detailed analysis, no site-specific mitigation measures would be necessary.

If any potential hazardous waste site is identified during final design, an environmental site assessment would be performed prior to the acquisition of the property. This assessment would establish the overall risk or liability the property represents to the purchaser. The site investigations would be conducted in accordance with WVDOT's *Guidelines for Identifying and Dealing with Hazardous Waste on Highway Projects* (WVDOT, 1989) and the guidelines set forth in FHWA's Technical Advisory T 6640.8A.

3.5.4 AIR QUALITY

The 1996 Corridor H FEIS included a detailed analysis of the predicted air quality along the immediate corridor of the 100-mile Corridor H highway project. A similar air quality analysis was performed for the Parsons-to-Davis Project to determine whether the 9-mile section for the OPA could be replaced with the ROPA/Preferred Alternative, Alternative 2 or one of the Blackwater Avoidance Alternatives without resulting in an exceedance of the National Ambient Air Quality Standards (NAAQS) for carbon monoxide (CO).

3.5.4.1 Existing Environment

The Study Area is located in Tucker County, West Virginia and within Region 3 of the USEPA's jurisdiction. The agencies normally involved with monitoring and regulating air quality in this region are the USEPA, the WVDEP, and WVDOT.

The Clean Air Act directed the USEPA to establish standards for clean air via the NAAQS. The NAAQS are shown in Table III-28. The standards represent levels of these pollutants and exposure

periods that pose no significant threat to human health or welfare. The state of West Virginia adheres to these same standards. As a result of the Clean Air Act Amendments, and based on historical monitoring data, Tucker County is designated as being in attainment for both CO and ozone (O_3), the pollutants most often associated with mobile source (motor vehicle) emissions.

Table III-28
National Ambient Air Quality Standards[a]

Pollutant	Primary Standards	Secondary Standards
Carbon Monoxide (CO)	1-hour Average[b] 35 parts per million (ppm) (40 milligrams per cubic meter of air [mg/m^3])	None
	8-hour Average[b] 9 ppm (10 mg/m^3)	None
Nitrogen Dioxide (NO_2)	Annual (Arithmetic Mean) 0.053 ppm (100 micrograms per cubic meter [$\mu g/m^3$])	Same as Primary
Ozone (O_3)	Maximum Daily 1-hour Average[c] 0.12 ppm (235 $\mu g/m^3$)	Same as Primary
	Maximum Daily 8-hour Average[c] 0.08 ppm (157 $\mu g/m^3$)	Same as Primary
Lead (Pb)	Maximum Quarterly Average 1.5 $\mu g/m^3$	Same as Primary
Particulate Matter (PM_{10})	Annual (Arithmetic Mean)[d] 50 $\mu g/m^3$	Same as Primary
	24-hour Average[b] 150 $\mu g/m^3$	Same as Primary
Particulate Matter ($PM_{2.5}$)	Annual (Arithmetic Mean)[d] 15 $\mu g/m^3$	Same as Primary
	24-hour Average[b] 65 $\mu g/m^3$	Same as Primary
Sulfur Dioxide (SO_2)	24-hour Average[b] 0.14 ppm (365 $\mu g/m^3$)	3-hour Average[b] 0.50 ppm (1,300 $\mu g/m^3$)
	Annual (Arithmetic Mean) 0.03 ppm (80 $\mu g/m^3$)	None

Source: 40 CFR Part 50.

[a] Parenthetical values are approximately equivalent concentrations.

[b] Not to be exceeded more than once per year.

[c] The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm or maximum 8-hour concentrations above 0.08 does not exceed 1.

[d] The annual standard is attained when the expected annual arithmetic mean concentration is less than or equal to 50 mg/m^3 for PM_{10} and 15 mg/m^3 for $PM_{2.5}$.

The term "attainment" refers to the status of the various pollutants described in the NAAQS. If a pollutant does not exceed the standard more than once per year, then it is considered in attainment of the standard. If the pollutant exceeds the standard two or more times during the year, then it is considered in non-attainment of the standard. When a proposed highway project is located in a non-attainment area, it must be included in an approved Transportation Improvement Plan or meet a series of requirements in order for the project to be approved. The Parsons-to-Davis Project is located in an area designated as being in attainment of the standard for both CO and O_3.

3.5.4.2 CO Microscale Analysis - Methodology

An air quality assessment was performed, using a microscale analysis, to determine the potential effects of the highway project on the surrounding local CO concentrations. The microscale analysis predicts the generation and transportation (dispersion) of CO within the immediate project vicinity. The years 2010 (opening year) and 2020 (design year) were analyzed and compared to the NAAQS criteria for CO. A detailed description of the methodology is provided in the 1996 Corridor H FEIS.

Receptor sites were modeled to represent locations where the highest CO concentration levels could be expected and where the general public could have access during the analysis periods. These receptors were placed at various offsets from the proposed Build Alternatives to represent locations where human activity may occur. The CO concentrations were compiled to include both vehicular and background CO concentrations.

3.5.4.3 Microscale Analysis - Results

Results from the microscale analysis show that none of the predicted one-hour analysis sites exceeded the one-hour CO criteria of 35 ppm, as identified in the NAAQS. These predicted concentrations also did not exceed the more stringent eight-hour CO concentration criteria of 9 ppm. Therefore, a separate eight-hour CO analysis was not performed because the one-hour concentrations were less than eight-hour NAAQS for CO (per USEPA guidelines).

Table III-29 shows the highest predicted one-hour CO concentrations at the various offsets for the 2010 opening and 2020 design years. These predicted CO concentration levels would be typical at locations along the Build Alternatives where the greatest traffic volumes would occur and where human activities may be expected to occur adjacent to the corridor ROW. All predicted concentrations include a conservative (worst-case) one-hour background CO level of 2.0 ppm.

Table III-29
Highest Predicted 1-Hour CO Concentrations for Years 2010 & 2020

Year	Carbon Monoxide Concentrations (ppm) at Offsets (in feet) from the Mainline with Highest Peak Hour Traffic Volumes													
	50	60	70	80	90	100	150	200	250	300	350	400	450	500
2010	2.9	2.7	2.6	2.6	2.6	2.6	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4
2020	3.0	3.0	3.0	2.9	2.8	2.8	2.6	2.5	2.4	2.4	2.4	2.4	2.4	2.4

Source: Michael Baker Jr., Inc.
NAAQS: 1-Hour = 35ppm, 8-Hour = 9ppm Predicted concentrations include a background CO level of 2.0 ppm.

The highest predicted one-hour CO concentration for the years 2010 and 2020 were 2.9 ppm and 3.0 ppm, respectively. Based on these results, no exceedances of either the one-hour or eight-hour criteria are predicted to occur for any of the Build Alternatives. These results are consistent with the air quality analysis conducted for the 1996 Corridor H FEIS where no receptor exceeded either the one or eight-hour criteria for CO.

With the implementation of the ROPA/Preferred Alternative, the OPA, or Alternative 2, the Truck Route would be in operation, which would divert between 45 and 90 percent of the current heavy truck traffic from downtown Thomas (see *Section 3.2.1: Economic Environment*). In the year 2020, the Truck Route will attract an approximate ADT of 500 trucks, of which 50 percent can be assumed to be heavy trucks. This would have a positive impact on the air quality of downtown Thomas. Specifically, the City of Thomas could expect a substantial decrease in Particulate Matter due to the diversion of truck traffic from the Truck Route associated with the ROPA/Preferred Alternative, OPA or Alternative 2.

3.5.4.4 Avoidance, Minimization & Mitigation

The Study Area is in an attainment area for CO. Based on the predicted results, the construction of any of the Build Alternatives carried forward for detailed analysis would not cause an exceedance of the NAAQS for CO in any of the analysis years. As described in the 1996 Corridor H FEIS, the No-Build Alternative will not impact the local air quality.

The predicted CO concentration levels for the proposed Build Alternatives are well below both the one-hour and eight-hour NAAQS criteria for CO. Therefore, no mitigation measures would be required. The Study Area is in an attainment area for O_3. It is also in an area where the State Implementation Plan does not contain any transportation control measures. Therefore, the conformity procedures of 40 CFR Part 51 do not apply.

A quantitative mesoscale or "regional" air quality analysis was not performed for the project because the Study Area is in attainment for both CO and O_3.

3.5.5 TRAFFIC NOISE

A noise analysis was prepared in accordance with the WVDOT Noise Analysis and Abatement Guidelines and in conjunction with 23 CFR 772, which establishes the requirement for a noise study for any proposed Federal or Federal-aid transportation project.

This section presents a description of the methods used in the analysis, applicable noise standards and criteria prescribed by Federal regulations and WVDOT, and the identification of noise sensitive areas contiguous to the project. Additionally, it contains the qualitative modeling results for the base year (1999) and design year (2020) build sound level environments, with a generalized comparison of the predicted future sound levels to the existing (base) year sound environment and to the noise abatement criteria. Finally, the analysis includes a discussion on noise abatement measures.

Details of the noise analysis for Corridor H as a whole are contained in the 1994 Corridor H ASDEIS *Air, Noise, and Energy Technical Report* (WVDOH, 1994b), and cumulative impacts were addressed in the 1996 Corridor H FEIS (p. III-250 to III-254).

3.5.5.1 Fundamentals of Sound and Noise

Sound intensity is normally presented as a sound level using the unit decibel (dB). The decibel is used to measure either sound power or sound pressure levels. These sound pressure levels are expressed as dBA Leq(h). The term dBA refers to decibels on the A-weighted scale that represents the way the human ear perceives sound. The term Leq(h) refers to the sound level that is representative of the average sound level over a one hour time period. Research has shown that normal human hearing can only detect sound level changes of three (3) decibels or more. Therefore, changes of one (1) or two (2) decibels are not generally noticeable.

3.5.5.2 Existing Environment

In order to assess the existing (ambient) sound environment within the Study Area, sound level measurements were taken at 17 representative sites, using a Metrosonics dB-3080 Sound Level Analyzer. Short-term measurement periods of 15 minutes duration each were conducted at the selected monitoring sites. These monitoring sites were chosen to be representative of the noise sensitive land uses adjacent to the Build Alternatives and characteristic of the existing background sound levels within the Study Area. Simultaneous traffic counts were also recorded for nearby roadways as applicable for validating the monitored verses modeled data. A summary of these monitoring sites and their associated sound levels is presented in Table III-30.

Dominant noise sources within the Study Area included traffic from nearby roadways, various localized neighborhood activities, and the sounds resulting from activities at the Tucker County

Landfill. Ambient sound levels measured in the field at the various monitoring locations ranged from 46 to 65 dBA Leq. The highest measured sound levels occurred at M-8, where sound levels are influenced by the peak-hour traffic volumes along US 219. The lowest sound level was measured at site M-14, where traffic noise contributions primarily came from secondary and local roads. These measured ambient sound levels characterize the existing sound environment within the Study Area and include representative peak-hour traffic conditions where appropriate.

Table III-30
Measured Ambient Sound Levels

ID No.	Noise Abatement Criteria (NAC) Level	Date	Measurement Period	Sound Level (dBA Leq)	Dominant Noise Source
M-1	66	2/13/02	15:30 – 15:45	47	Quiet, distant heavy truck (HT) traffic on US 219
M-2	66	2/12/02	8:40 – 8:55	53	Traffic on US 219
M-3	66	2/12/02	9:30 – 9:45	50	Traffic on US 219
M-4	66	2/12/02	11:30 – 11:45	62	Traffic on US 219
M-5	66	2/12/02	12:05 – 12:20	46	Quiet, local ambient sounds
M-6	66	2/12/02	13:45 – 14:00	61	Traffic on US 219 and Tucker Co. 18
M-7	66	2/12/02	13:07 – 13:22	51	Traffic on US 219 and Tucker Co. 18
M-8	66	2/12/02	14:10 – 14:25	65	Traffic on US 219
M-9	66	2/12/02	16:30 – 16:45	52	Quiet, distant traffic on US 219
M-10	66	2/12/02	15:15 – 15:30	50	Quiet, distant traffic on US 219
M-11	66	2/12/02	14:40 – 14:55	60	Local activities at nursing facility, Traffic on US 219
M-12	66	2/13/02	8:24 – 8:39	64	Traffic on WV 32 (South)
M-13	66	2/13/02	9:48 – 10:03	47	Distant HT traffic on WV 32, local school activities inside school
M-14	66	2/13/02	12:45 – 13:00	46	Quiet, local ambient sounds
M-15	71	2/13/02	13:23 – 13:38	63	Landfill operational noises
M-16	66	2/13/02	14:36 – 14:51	52	Local ambient sounds, distant HT traffic on WV 93
M-17	66	2/13/02	14:00 –14:15	53	Distant noise from landfill operations, distant HT traffic on WV 93

3.5.5.3 Traffic Noise Modeling and Impacts

Methodology

Noise Sensitive Areas

Land use and noise levels interact to play an important role in the impact of traffic-generated noise on an area. Some types of land use are more sensitive to noise levels than others. Typically, the land use most sensitive to noise is residential, especially those residential areas composed of single-family dwellings. Other land uses with less sensitivity to noise include open range and pasture lands, wooded areas, commercial and industrial properties, and agricultural areas.

Land within the Study Area is composed primarily of mixed deciduous forest and large tracts of undeveloped land. Areas of rural development and their associated land uses are dispersed

throughout the Study Area. They consist of mixed land uses, including residential dwellings, farmsteads and associated buildings, commercial businesses, public service facilities, churches, and schools. Communities include the City of Thomas and the neighborhoods of Benbush, William, Railroad Hill, Cortland Acres, and Coketon. The Town of Davis is located immediately southeast of the Study Area.

Exhibit III-9 shows the locations of all the noise sensitive receptors included in the noise analysis modeling.

Noise Standards and Criteria

The WVDOT Noise Analysis and Abatement Guidelines were used to provide subjective descriptors of noise impacts at receptors along the proposed Build Alternatives in conjunction with 23 CFR 772. These define traffic noise impacts as "impacts which occur when predicted traffic noise levels approach or exceed the Noise Abatement Criteria (NAC), or when the predicted traffic noise levels substantially exceed the existing noise levels." The NAC are expressed in terms of dBA Leq(h), and describe the various degrees of noise sensitivity for different land use activity categories. Table III-31 shows the NAC for various land use activity categories. The approach criterion is defined as one dBA less than the criterion for each Activity Category. Also, a 16 dBA increase over the existing condition is considered a "substantial increase impact" according to WVDOT guidelines.

Table III-31
FHWA Noise Abatement Criteria (NAC)

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

Source: 23 CFR 772
*Hourly A-weighted Sound Level (dBA)

Noise sensitive receptors evaluated in the analysis were representative of Category B and C receptors. Category B represents the exterior sound levels of such places as parks, residences, schools and hospitals. Category C represents exterior sound levels at commercial and business sites. According to FHWA and WVDOH noise analysis policy as derived through 23 CFR 772, an impact at any Category B receptor occurs if the design year Build Alternative sound levels equal or exceeds the approach criterion of 66 dBA. For Category C receptors, the criterion is 71 dBA.

Traffic Noise Model

Traffic noise calculations were performed using the FHWA's Traffic Noise Model, Version 1.0b (1999). The Traffic Noise Model or TNM1.0b calculates noise levels in the vicinity of highways using a one-third octave-band database and algorithms. The noise modeling accounted for operating speed and peak-hour traffic volumes for autos, medium trucks (two-axle, six-tires), and

heavy trucks (three or more axles). In addition, tree zones, terrain, and elevation were also incorporated into the noise modeling.

Traffic Data

Paragraph b, Section 772.17 of 23 CFR 772 states that, "in predicting noise levels and assessing noise impacts, traffic characteristics which will yield the worst hourly traffic noise impact on a regular basis for the design year shall be used." Since the level of highway traffic noise is normally related directly to the traffic volume, the traffic characteristics that will yield the worst hourly traffic noise impact on a regular basis for the design year will be the average hourly volume for the highest traffic hour of each day.

Traffic volumes for the Study Area were derived from traffic reports prepared by WVDOH and Michael Baker Jr., Inc. The design directional hourly volumes (DDHV) were used in the analyses to represent the loudest period of the day. An operating speed of 60 miles per hour (mph) was used for the proposed Build Alternatives, while the posted speed limits were used for all existing roadways. Traffic assumptions included a DDHV of ten (10) percent. Recent traffic surveys indicate that the vehicle mix for the proposed highway would consist of eighty-seven (87) percent automobiles (including pickup trucks, vans, etc.), three (3) percent medium trucks (two-axle, six-tires), and ten (10) percent heavy trucks (three or more axles).

Traffic Noise Impacts

The locations of the receptors identified as noise sensitive sites and modeled in the analysis are illustrated in Exhibit III-9 and listed in Table III-32. Table III-33 shows the sound level environments and identified criteria impacts at each of the modeled receptor locations for the base year (existing condition), and design year (2020) No-Build Alternative and Build Alternatives.

Base Year

Existing noise levels for receptors in the Study Area range from 42 dBA to 70 dBA. Areas with higher noise levels are located near the major roadways in the Study Area (i.e., US 219, WV 93 and WV 32). Existing noise levels indicate that six (6) NAC Category B receptors currently approach or exceed the NAC impact criterion of 66 dBA (receptors 1, 29, 55, 57, 58, and 59). Modeled existing noise levels are presented in Table III-33.

No-Build Alternative

The modeled noise levels under the No-Build Alternative in the design year indicate that the six (6) receptors currently impacted under the NAC criteria will continue to be impacted by traffic noise in the future. An additional four (4) NAC Category B receptors will also approach or exceed the NAC criteria (66 dBA). These are receptors 2, 33, 35, and 53. There will be no West Virginia (WV) substantial increase criteria impacts with the No-Build Alternative. Modeled No-Build Alternative noise levels are shown in Table III-33 and summarized in Table III-34.

Build Alternatives

Design year predicted noise levels at each of the receptor sites were modeled for each Build Alternative and are shown in Table III-33. A summary of impacts is provided in Table III-34.

None of the Build Alternatives will have more NAC impacts than the No-Build Alternative (10 NAC impacts) in the design year. The ROPA/Preferred Alternative, along with Alternatives 1E, 1G (both East and West), and Alternative 2 will have the least number of impacts with seven (7) NAC impacts. Alternatives 1D (both East and West) and the OPA are predicted to impact the most number of sensitive receptors, with eight (8) NAC impacts. There were no predicted WV substantial increase criteria impacts for any of the alternatives carried forward for detailed analysis. All of the impacted receptors are NAC Category B (Table III-32).

The proposed Truck Route, near the community of Thomas, is now considered part of the ROPA, OPA and Alternative 2. When combined with any of these alternatives, the Truck Route is predicted to impact five (5) locations, all of which are already predicted to be impacted by the ROPA, OPA or Alternative 2 alone (53, 55, 57, 58 and 59).

Table III-32
Modeled Noise-Sensitive Receptors

Receptor Number	Description / Location	NAC Type
1	Residential home located at intersection of US219 & CR-18 in Benbush	B
2	Residential home located at intersection of US219 & CR-18 in Benbush	B
3	Residential home located on access road off of US219 at Benbush	B
4 (M-6)	Residential home located on CR-18 at Benbush	B
5	Residential home located on CR-18 at Benbush	B
6	Residential home located on CR-18 at Benbush	B
7	Residential home located on CR-18 at Benbush	B
8	Residential home located on CR-18 at Benbush	B
9	Residential home located on access road off of CR-18 at Benbush	B
10	Residential mobile home located on access road off of CR-18 at Benbush	B
11	Residential home located on access road off of CR-18 at Benbush	B
12	Residential home located on access road off of CR-18 at Benbush	B
13	Residential home located on CR-18 at Benbush	B
14	Residential home located on CR-18 at Benbush	B
15	Residential home located on CR-18 at Benbush	B
16	Residential home located on CR-18 at Benbush	B
17	Residential home located on CR-18 at Benbush	B
18	Residential home located on CR-18 at Benbush	B
19	Residential home located on CR-18 at Benbush	B
20	Residential home located on CR-18 at Benbush	B
21	Residential home located on CR-18 at Benbush	B
22 (M-7)	Residential home located on CR-18 at Benbush	B
23	Residential home located on CR-18 at Benbush	B
24	Office/tower building at airfield landing strip off of Cortland Acres Drive	C
25	Ground maintenance building at Rose Hill Cemetery on Cortland Acres Drive	C
26 (M-10)	Thomas City Park located near intersection of US219 & WV32	B
27	Pineview Apartments located on US219 near intersection with Cortland Acres Drive	B
28	Pineview Apartments located on US219 near intersection with Cortland Acres Drive	B

Receptor Number	Description / Location	NAC Type
29	Pineview Apartments located on US219 near intersection with Cortland Acres Drive	B
30	Pineview Apartments located on US219 near intersection with Cortland Acres Drive	B
31 (M-11)	Cortland Acres Nursing Home on US219 near intersection with Cortland Acres Drive	B
32 (M-14)	Residential home located at end of CR-27/4 in Coketon	B
33	Residential home located on SB section of US219 (Spruce St.) in Thomas	B
34	Residential home located on SB section of US219 (Spruce St.) in Thomas	B
35	Residential home located on SB section of US219 (Spruce St.) in Thomas	B
36	Residential home located on side street off of US219 in northern section of Thomas	B
37 (M-9)	Residential home located on side street off of US219 in northern section of Thomas	B
38	Residential home located on side street off of US219 in northern section of Thomas	B
39	Residential home located on side street off of US219 in northern section of Thomas	B
40	Ground maintenance building at Thomas Cemetery located on Second St. in Thomas	C
41 (M-13)	Public School Building located on Second St. in Thomas	B
42 (M-15)	Thomas Landfill Operations building located north of WV32 and WV93 intersection	C
43	Davis Community Baseball Field Complex near intersection of WV32 and WV93	B
44	Residential home located in subdivision south of WV93 in Davis	B
45 (M-17)	2 Residential homes located in subdivision south of WV93 in Davis	B
46	4 Residential mobile homes located on Fairfax Ave in subdivision in Davis	B
47	4 Residential mobile homes located on Fairfax Ave in subdivision in Davis	B
48	Residential home located in subdivision south of WV93 in Davis	B
49	Residential home located in subdivision south of WV93 in Davis	B
50	5 Residential homes located on Fairfax Ave in subdivision in Davis	B
51	3 Residential homes located on Fairfax Ave in subdivision in Davis	B
52	3 Residential mobile homes located in subdivision south of WV93 in Davis	B
53	Residential home located on US219 north of Thomas	B
54	Residential mobile home located on US219 south of intersection with WV90	B
55	Residential home located on US219 south of intersection with WV90	B
56	Residential home located on US219 south of intersection with WV90	B
57	Residential home located on US219 south of intersection with WV90	B
58	Residential home located on US219 south of intersection with WV90	B
59	Residential home located on US219 south of intersection with WV90	B
60	Residential home located on Fairfax Ave in subdivision in Davis	B

Receptor Number	Description / Location	NAC Type
61	Residential home located in subdivision south of WV93 in Davis	B
62	Residential home located on Fairfax Ave in subdivision in Davis	B
63	Residential mobile home located on Fairfax Ave in subdivision in Davis	B
64	Residential home located in subdivision south of WV93 in Davis	B
65	Residential home located on Fairfax Ave in subdivision in Davis	B
66	Residential home located on Fairfax Ave in subdivision in Davis	B
67	Residential home located on Fairfax Ave in subdivision in Davis	B
68 (M-16)	Residential home located in subdivision south of WV93 in Davis	B
69	Residential mobile home located on Fairfax Ave in subdivision in Davis	B
70	Residential home located on Second Street in subdivision in Davis	B
71	Residential home located on Second Street in subdivision in Davis	B
72	Residential home located on Kent Ave in subdivision in Davis	B
73	Residential home located on Kent Ave in subdivision in Davis	B
101	Residential home located on access road off of US 219	B
104	Residential home located on CR-219/4	B
105	Residential mobile home located on CR-219/4	B
106 (M-1)	Farm house located off of CR-219/4	B
107	Residential home located on CR-219/4	B
108	Residential home located on CR-219/4	B
109	Residential home located on CR-219/4	B
110	Residential mobile home located on CR-219/3	B
111	Residential home located on CR-219/3	B
112	Residential home (2) located on CR-219/3	B
113	Residential home located on access road off of US 219, south of High School	B
114	Residential home located on access road off of US 219, south of High School	B
115	Residential home located on access road off of US 219, south of High School	B
116	Residential home located on access road off of US 219, south of High School	B
117 (M-2)	Vacant Cabin located on access road off of US 219, south of High School	B
118 (M-3)	TCHS located on US 219	B
119	Residential home located on access road off of US 219, near the High School	B
120 (M-4)	Centennial Park and Scenic Overlook on US 219	B
121	Residential home located on CR-25	B
122	Residential mobile home located on CR-25	B

Receptor Number	Description / Location	NAC Type
123	Residential home located on CR-25	B
124	Residential home located on CR-25	B
125	Residential mobile home located on CR-25	B
126	Residential mobile home located on CR-25	B
127	Residential home located on CR-25	B
128 (M-5)	Sugarland Church located on CR-25	B
129	Residential home located on access road off of CR-25	B
130	Commercial/Business located on CR-25	C
131	Residential mobile home located on CR-25	B
132	Residential home located on access road off of CR-25	B
133	Sugarland School located on CR-25/4	B
134	Residential home located on CR-25/4	B
135	Residential home located on CR-25/4	B
136	Residential home located on CR-25/4	B
137	Residential home located on access road off of CR-25/4	B
138	Residential home located on access road off of CR-25	B
139	Mount Olive Church located on CR-25	B
140	Residential home located on CR-25	B
141	Mining Operations trailer located on CR-25	C
142	Residential home located on CR-25/5	B
143	Residential home located on CR-25/5	B
144	Residential home located on CR-25/5	B
145	Residential home located on CR-25/5	B
146	Residential mobile home located on CR-25/5	B
147	Residential home located on access road off of CR-25/5	B
148	Residential mobile home located on access road off of CR-25/5	B
149	Residential home located on access road off of CR-25/5	B
150	Residential home located on access road off of CR-25/5	B
151	Residential home located on CR-25/5	B
152	Residential home located on CR-25/5	B
153	Residential home located on CR-25/5	B
779	Residential home located near CR-27 in Coketon	B
780	Residential home located on CR-27 in Coketon	B

Receptor Number	Description / Location	NAC Type
781	Residential home located on CR-27 in Coketon	B
782	Residential home located on CR-27 in Coketon	B
786	Residential home located on CR-27 in Coketon	B
787	Residential home located on CR-27 in Coketon	B
788	Residential home located on CR-27 in Coketon	B
792	Residential home located in subdivision off of Eucid Ave in Thomas	B
793	Residential home located in subdivision off of Eucid Ave in Thomas	B
796	Residential home located in subdivision off of Eucid Ave in Thomas	B
797	Residential home located in subdivision off of Eucid Ave in Thomas	B
801	Residential home located at end of access road near intersection of CR-29 & WV32	B
802	Residential mobile home located on CR-29 in Davis	B
803	Residential mobile home located on CR-29 in Davis	B
804	Residential mobile home located on CR-29 in Davis	B
805	Residential home located on CR-29 in Davis	B
806	Residential home located in subdivision on Eucid Ave in Thomas	B
807	Residential home located in subdivision on Eucid Ave in Thomas	B
809	Residential home located on Seventh Street in subdivision in Davis	B
810	Residential home located on Fairfax Ave in subdivision in Davis	B
811	Residential home located on Fairfax Ave in subdivision in Davis	B
812	Residential home located on Fairfax Ave in subdivision in Davis	B
813	Residential home located on Fairfax Ave in subdivision in Davis	B
814	Residential home located on Seventh Street in subdivision in Davis	B
815	Residential home located on Seventh Street in subdivision in Davis	B
816	Residential home located on Blackwater Ave in subdivision in Davis	B
817	Residential home located on Kent Ave in subdivision in Davis	B
818	Residential home located on Blackwater Ave in subdivision in Davis	B
M-12	Speaking platform located in downtown Thomas adjacent to WV 32 S	B
---	Knights of Columbus ballfield adjacent to WV 32 (near proposed Truck Route terminus)	B

Table III-33
Modeled Noise Levels at Noise Sensitive Receptors

Receptor ID Number and NAC Level		Base Year		No-Build Alternative			1 D West			1D East			1E			1G West			1G East			2			OPA			ROPA/Preferred Alternative		
		Noise Level	NAC Impact?	Noise Level	Change	Impact?	Noise Level	Change	Impact?	Noise Level	Change	Impact?	Noise Level	Change	Impact?	Noise Level	Change	Impact?	Noise Level	Change	Impact?	Noise Level	Change	Impact?	Noise Level	Change	Impact?	Noise Level	Change	Impact?
1	66	68	**NAC**	70	2	**NAC**	68	0	**NAC**	68	0	**NAC**	68	0	**NAC**	67	-1	**NAC**	67	-1	**NAC**	67	-1	**NAC**	67	-1	**NAC**	67	-1	**NAC**
2	66	65	No	67	2	**NAC**	67	2	**NAC**	67	2	**NAC**	65	0	No	65	0	No	65	0	No	64	-1	No	64	-1	No	64	-1	No
3	66	52	No	54	2	No	57	5	No	57	5	No	57	5	No	51	-1	No	51	-1	No	51	-1	No	51	-1	No	51	-1	No
4	66	55	No	58	3	No	61	6	No	61	6	No	62	7	No	58	3	No	58	3	No	58	3	No	58	3	No	58	3	No
5	66	55	No	58	3	No	61	6	No	61	6	No	61	6	No	58	3	No	58	3	No	58	3	No	58	3	No	58	3	No
6	66	54	No	57	3	No	59	5	No	59	5	No	60	6	No	57	3	No	57	3	No	57	3	No	57	3	No	57	3	No
7	66	57	No	60	3	No	61	4	No	61	4	No	61	4	No	60	3	No	60	3	No	60	3	No	60	3	No	60	3	No
8	66	54	No	57	3	No	59	5	No	59	5	No	60	6	No	57	3	No	57	3	No	57	3	No	57	3	No	57	3	No
9	66	46	No	47	1	No	54	8	No	54	8	No	57	11	No	46	0	No	46	0	No	46	0	No	46	0	No	46	0	No
10	66	46	No	48	2	No	55	9	No	55	9	No	58	12	No	46	0	No	46	0	No	46	0	No	46	0	No	46	0	No
11	66	46	No	48	2	No	55	9	No	55	9	No	58	12	No	46	0	No	46	0	No	46	0	No	46	0	No	46	0	No
12	66	46	No	47	1	No	56	10	No	56	10	No	59	13	No	46	0	No	46	0	No	46	0	No	46	0	No	46	0	No
13	66	50	No	53	3	No	56	6	No	56	6	No	57	7	No	53	3	No	53	3	No	53	3	No	53	3	No	53	3	No
14	66	53	No	56	3	No	58	5	No	58	5	No	58	5	No	56	3	No	56	3	No	56	3	No	56	3	No	56	3	No
15	66	49	No	52	3	No	56	7	No	56	7	No	57	8	No	52	3	No	52	3	No	52	3	No	52	3	No	52	3	No
16	66	56	No	59	3	No	60	4	No	60	4	No	61	5	No	59	3	No	59	3	No	59	3	No	59	3	No	59	3	No
17	66	51	No	54	3	No	56	5	No	56	5	No	57	6	No	54	3	No	54	3	No	54	3	No	54	3	No	54	3	No
18	66	46	No	48	2	No	52	6	No	52	6	No	54	8	No	48	2	No	48	2	No	47	1	No	47	1	No	47	1	No
19	66	57	No	60	3	No	61	4	No	61	4	No	61	4	No	61	4	No	61	4	No	61	4	No	61	4	No	61	4	No
20	66	52	No	55	3	No	56	4	No	56	4	No	57	5	No	55	3	No	55	3	No	55	3	No	55	3	No	55	3	No
21	66	56	No	59	3	No	60	4	No	60	4	No	60	4	No	59	3	No	59	3	No	59	3	No	59	3	No	59	3	No
22	66	58	No	61	3	No	62	4	No	62	4	No	62	4	No	62	4	No	62	4	No	62	4	No	62	4	No	62	4	No
23	66	54	No	57	3	No	58	4	No	58	4	No	59	5	No	57	3	No	57	3	No	57	3	No	57	3	No	57	3	No
24	71	43	No	43	0	No	45	2	No	45	2	No	49	6	No	55	12	No	55	12	No	43	0	No	43	0	No	43	0	No
25	71	43	No	44	1	No	45	2	No	45	2	No	44	1	No	56	13	No	56	13	No	43	0	No	43	0	No	43	0	No
26	66	46	No	48	2	No	50	4	No	50	4	No	48	2	No	58	12	No	58	12	No	48	2	No	48	2	No	48	2	No
27	66	51	No	53	2	No	49	-2	No	49	-2	No	49	-2	No	59	8	No	59	8	No	49	-2	No	49	-2	No	49	-2	No
28	66	55	No	57	2	No	53	-2	No	53	-2	No	53	-2	No	61	6	No	61	6	No	53	-2	No	53	-2	No	53	-2	No
29	66	68	**NAC**	70	2	**NAC**	66	-2	**NAC**	66	-2	**NAC**	66	-2	**NAC**	67	-1	**NAC**	67	-1	**NAC**	66	-2	**NAC**	66	-2	**NAC**	66	-2	**NAC**
30	66	57	No	59	2	No	55	-2	No	55	-2	No	55	-2	No	60	3	No	60	3	No	54	-3	No	54	-3	No	54	-3	No
31	66	61	No	63	2	No	60	-1	No	60	-1	No	60	-1	No	61	0	No	61	0	No	60	-1	No	60	-1	No	60	-1	No
32	B	44	No	45	1	No	45	1	No	45	1	No	43	-1	No	50	6	No	50	6	No	54	10	No	54	10	No	54	10	No
33	66	65	No	67	2	**NAC**	65	0	No	65	0	No	65	0	No	65	0	No	65	0	No	65	0	No	65	0	No	65	0	No
34	66	63	No	65	2	No	64	1	No	64	1	No	64	1	No	64	1	No	64	1	No	64	1	No	64	1	No	64	1	No
35	66	64	No	66	2	**NAC**	64	0	No	64	0	No	64	0	No	65	1	No	65	1	No	64	0	No	64	0	No	64	0	No
36	66	49	No	51	2	No	50	1	No	50	1	No	51	2	No	55	6	No	55	6	No	50	1	No	50	1	No	50	1	No
37	66	44	No	45	1	No	48	4	No	48	4	No	48	4	No	52	8	No	52	8	No	44	0	No	44	0	No	44	0	No
38	66	44	No	45	1	No	50	6	No	50	6	No	48	4	No	52	8	No	52	8	No	44	0	No	44	0	No	44	0	No
39	66	44	No	45	1	No	50	6	No	50	6	No	47	3	No	52	8	No	52	8	No	44	0	No	44	0	No	44	0	No
40	71	43	No	44	1	No	44	1	No	44	1	No	43	0	No	46	3	No	46	3	No	43	0	No	43	0	No	43	0	No
41	66	45	No	46	1	No	47	2	No	47	2	No	46	0	No	49	4	No	49	4	No	45	0	No	45	0	No	45	0	No

Receptor ID Number and NAC Level		Base Year		No-Build Alternative			1 D West			1D East			1E			1G West			1G East			2			OPA			ROPA/Preferred Alternative		
		Noise Level	NAC Impact?	Noise Level	Change	Impact?	Noise Level	Change	Impact?	Noise Level	Change	Impact?	Noise Level	Change	Impact?	Noise Level	Change	Impact?	Noise Level	Change	Impact?	Noise Level	Change	Impact?	Noise Level	Change	Impact?	Noise Level	Change	Impact?
42	71	60	No	60	0	No	66	6	No	60	0	No	62	2	No	66	6	No	60	0	No	62	2	No	62	2	No	62	2	No
43	66	51	No	53	2	No	53	2	No	53	2	No	54	3	No	53	2	No	53	2	No	54	3	No	54	3	No	54	3	No
44	66	47	No	49	2	No	51	4	No	48	1	No	50	3	No	51	4	No	48	1	No	50	3	No	50	3	No	50	3	No
45	66	47	No	49	2	No	49	2	No	47	0	No	49	2	No	49	2	No	47	0	No	49	2	No	49	2	No	49	2	No
46	66	45	No	46	1	No	49	4	No	48	3	No	49	4	No	49	4	No	48	3	No	49	4	No	49	4	No	49	4	No
47	66	45	No	46	1	No	50	5	No	50	5	No	49	4	No	50	5	No	50	5	No	49	4	No	49	4	No	49	4	No
48	66	45	No	47	2	No	51	6	No	51	6	No	50	5	No	51	6	No	51	6	No	50	5	No	50	5	No	50	5	No
49	66	46	No	48	2	No	52	6	No	51	5	No	51	5	No	52	6	No	51	5	No	51	5	No	51	5	No	51	5	No
50	66	45	No	46	1	No	50	5	No	51	6	No	50	5	No	50	5	No	51	6	No	50	5	No	50	5	No	50	5	No
51	66	45	No	46	1	No	48	3	No	46	1	No	49	4	No	48	3	No	46	1	No	49	4	No	49	4	No	49	4	No
52	66	44	No	45	1	No	50	6	No	50	6	No	49	5	No	50	6	No	50	6	No	49	5	No	49	5	No	49	5	No
53	66	65	No	67	2	**NAC**	67	2	**NAC**	67	2	**NAC**	68	3	**NAC**	69	4	**NAC**	69	4	**NAC**	68	3	**NAC**	68	3	**NAC**	68	3	NAC
54	66	62	No	64	2	No	65	3	No	65	3	No	65	3	No	65	3	No	65	3	No	65	3	No	65	3	No	65	3	No
55	66	68	**NAC**	70	2	**NAC**	71	3	**NAC**	71	3	**NAC**	71	3	**NAC**	71	3	**NAC**	71	3	**NAC**	71	3	**NAC**	71	3	**NAC**	71	3	NAC
56	66	57	No	59	2	No	60	3	No	60	3	No	60	3	No	60	3	No	60	3	No	60	3	No	60	3	No	60	3	No
57	66	68	**NAC**	70	2	**NAC**	71	3	**NAC**	71	3	**NAC**	71	3	**NAC**	71	3	**NAC**	71	3	**NAC**	71	3	**NAC**	71	3	**NAC**	71	3	NAC
58	66	70	**NAC**	72	2	**NAC**	73	3	**NAC**	73	3	**NAC**	73	3	**NAC**	73	3	**NAC**	73	3	**NAC**	73	3	**NAC**	73	3	**NAC**	73	3	NAC
59	66	66	**NAC**	68	2	**NAC**	70	4	**NAC**	70	4	**NAC**	70	4	**NAC**	70	4	**NAC**	70	4	**NAC**	70	4	**NAC**	70	4	**NAC**	70	4	NAC
60	66	45	No	46	1	No	50	5	No	51	6	No	49	4	No	50	5	No	51	6	No	49	4	No	49	4	No	49	4	No
61	66	46	No	47	1	No	51	5	No	51	5	No	50	4	No	51	5	No	51	5	No	50	4	No	50	4	No	50	4	No
62	66	45	No	47	2	No	51	6	No	51	6	No	50	5	No	51	6	No	51	6	No	50	5	No	50	5	No	50	5	No
63	66	45	No	47	2	No	50	5	No	51	6	No	50	5	No	50	5	No	51	6	No	50	5	No	50	5	No	50	5	No
64	66	46	No	47	1	No	50	4	No	51	5	No	50	4	No	50	4	No	51	5	No	50	4	No	50	4	No	50	4	No
65	66	45	No	47	2	No	50	5	No	51	6	No	50	5	No	50	5	No	51	6	No	50	5	No	50	5	No	50	5	No
66	66	46	No	47	1	No	50	4	No	51	5	No	50	4	No	50	4	No	51	5	No	50	4	No	50	4	No	50	4	No
67	66	44	No	45	1	No	48	4	No	46	2	No	48	4	No	48	4	No	46	2	No	48	4	No	48	4	No	48	4	No
68	66	44	No	45	1	No	48	4	No	47	3	No	48	4	No	48	4	No	47	3	No	48	4	No	48	4	No	48	4	No
69	66	44	No	45	1	No	50	6	No	47	3	No	51	7	No	50	6	No	47	3	No	51	7	No	51	7	No	51	7	No
70	66	45	No	46	1	No	51	6	No	47	2	No	50	5	No	51	6	No	47	2	No	50	5	No	50	5	No	50	5	No
71	66	44	No	45	1	No	49	5	No	48	4	No	49	5	No	49	5	No	48	4	No	49	5	No	49	5	No	49	5	No
72	66	45	No	46	1	No	50	5	No	48	3	No	50	5	No	50	5	No	48	3	No	50	5	No	50	5	No	50	5	No
73	66	46	No	47	1	No	49	3	No	49	3	No	48	2	No	49	3	No	49	3	No	48	2	No	48	2	No	48	2	No
101	66	46	No	48	2	No	54	8	No	54	8	No	54	8	No	54	8	No	54	8	No	54	8	No	52	6	No	52	6	No
104	66	42	No	44	2	No	48	6	No	48	6	No	48	6	No	48	6	No	48	6	No	50	8	No	51	9	No	51	9	No
105	66	42	No	44	2	No	49	7	No	49	7	No	49	7	No	49	7	No	49	7	No	51	9	No	51	9	No	51	9	No
106	66	42	No	43	1	No	48	6	No	48	6	No	48	6	No	48	6	No	48	6	No	50	8	No	51	9	No	51	9	No
107	66	42	No	42	0	No	43	1	No	43	1	No	43	1	No	43	1	No	43	1	No	45	3	No	51	9	No	50	8	No
108	66	51	No	52	1	No	52	1	No	52	1	No	52	1	No	52	1	No	52	1	No	52	1	No	52	1	No	51	0	No
109	66	50	No	51	1	No	51	1	No	51	1	No	51	1	No	51	1	No	51	1	No	51	1	No	51	1	No	50	0	No
110	66	47	No	47	0	No	51	4	No	51	4	No	51	4	No	51	4	No	51	4	No	53	6	No	47	0	No	47	0	No
111	66	48	No	48	0	No	51	3	No	51	3	No	51	3	No	51	3	No	51	3	No	53	5	No	48	0	No	48	0	No
112	66	48	No	48	0	No	51	3	No	51	3	No	51	3	No	51	3	No	51	3	No	52	4	No	48	0	No	48	0	No
113	66	53	No	55	2	No	52	-1	No	52	-1	No	52	-1	No	52	-1	No	52	-1	No	52	-1	No	66	13	**NAC**	63	10	No

Receptor ID Number and NAC Level		Base Year		No-Build Alternative			1 D West			1D East			1E			1G West			1G East			2			OPA			ROPA/Preferred Alternative		
		Noise Level	NAC Impact?	Noise Level	Change	Impact?	Noise Level	Change	Impact?	Noise Level	Change	Impact?	Noise Level	Change	Impact?	Noise Level	Change	Impact?	Noise Level	Change	Impact?	Noise Level	Change	Impact?	Noise Level	Change	Impact?	Noise Level	Change	Impact?
114	66	48	No	50	2	No	47	-1	No	47	-1	No	47	-1	No	47	-1	No	47	-1	No	47	-1	No	59	11	No	57	9	No
115	66	51	No	53	2	No	50	-1	No	50	-1	No	50	-1	No	50	-1	No	50	-1	No	50	-1	No	60	9	No	58	7	No
116	66	53	No	55	2	No	52	-1	No	52	-1	No	52	-1	No	52	-1	No	52	-1	No	52	-1	No	61	8	No	59	6	No
117	66	57	No	59	2	No	56	-1	No	56	-1	No	56	-1	No	56	-1	No	56	-1	No	56	-1	No	64	7	No	62	5	No
118	66	44	No	46	2	No	52	8	No	52	8	No	52	8	No	52	8	No	52	8	No	49	5	No	43	-1	No	43	-1	No
119	66	42	No	43	1	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No
120	66	62	No	64	2	No	61	-1	No	61	-1	No	61	-1	No	61	-1	No	61	-1	No	64	2	No	59	-3	No	59	-3	No
121	66	42	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No
122	66	42	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No
123	66	42	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No
124	66	42	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No
125	66	51	No	52	1	No	52	1	No	52	1	No	52	1	No	52	1	No	52	1	No	52	1	No	52	1	No	52	1	No
126	66	50	No	51	1	No	51	1	No	51	1	No	51	1	No	51	1	No	51	1	No	52	2	No	51	1	No	51	1	No
127	66	46	No	47	1	No	47	1	No	47	1	No	47	1	No	47	1	No	47	1	No	47	1	No	47	1	No	47	1	No
128	66	53	No	54	1	No	54	1	No	54	1	No	54	1	No	54	1	No	54	1	No	54	1	No	54	1	No	54	1	No
129	66	42	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No
130	71	49	No	50	1	No	51	2	No	51	2	No	51	2	No	51	2	No	51	2	No	51	2	No	50	1	No	50	1	No
131	66	42	No	43	1	No	46	4	No	46	4	No	46	4	No	46	4	No	46	4	No	46	4	No	43	1	No	43	1	No
132	66	42	No	42	0	No	44	2	No	44	2	No	44	2	No	44	2	No	44	2	No	44	2	No	42	0	No	42	0	No
133	66	47	No	47	0	No	47	0	No	47	0	No	47	0	No	47	0	No	47	0	No	47	0	No	47	0	No	47	0	No
134	66	42	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No
135	66	42	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No
136	66	42	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No
137	66	42	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No
138	66	42	No	42	0	No	50	8	No	50	8	No	50	8	No	50	8	No	50	8	No	49	7	No	42	0	No	42	0	No
139	66	46	No	48	3	No	51	5	No	51	5	No	51	5	No	51	5	No	51	5	No	50	4	No	48	2	No	48	2	No
140	66	44	No	45	1	No	50	6	No	50	6	No	50	6	No	50	6	No	50	6	No	48	4	No	45	1	No	45	1	No
141	71	44	No	46	2	No	50	6	No	50	6	No	50	6	No	50	6	No	50	6	No	47	3	No	46	2	No	46	2	No
142	66	42	No	42	0	No	46	4	No	46	4	No	46	4	No	46	4	No	46	4	No	42	0	No	42	0	No	42	0	No
143	66	42	No	42	0	No	48	6	No	48	6	No	48	6	No	48	6	No	48	6	No	43	1	No	42	0	No	42	0	No
144	66	42	No	42	0	No	47	5	No	47	5	No	47	5	No	47	5	No	47	5	No	42	0	No	42	0	No	42	0	No
145	66	42	No	42	0	No	45	3	No	45	3	No	45	3	No	45	3	No	45	3	No	42	0	No	42	0	No	42	0	No
146	66	42	No	42	0	No	45	3	No	45	3	No	45	3	No	45	3	No	45	3	No	43	1	No	42	0	No	42	0	No
147	66	42	No	42	0	No	44	2	No	44	2	No	44	2	No	44	2	No	44	2	No	42	0	No	42	0	No	42	0	No
148	66	42	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	45	3	No	42	0	No	42	0	No
149	66	42	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No
150	66	42	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No
151	66	42	No	42	0	No	44	2	No	44	2	No	44	2	No	44	2	No	44	2	No	43	1	No	42	0	No	42	0	No
152	66	42	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	43	1	No	42	0	No	42	0	No
153	66	42	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No	42	0	No
779	66	42	No	43	1	No	43	1	No	43	1	No	43	1	No	43	1	No	43	1	No	43	1	No	43	1	No	43	1	No
780	66	44	No	46	2	No	46	2	No	46	2	No	46	2	No	46	2	No	46	2	No	56	12	No	56	12	No	57	13	No
781	66	45	No	47	2	No	48	3	No	48	3	No	48	3	No	48	3	No	48	3	No	55	10	No	55	10	No	55	10	No

Receptor ID Number and NAC Level		Base Year		No-Build Alternative			1 D West			1D East			1E			1G West			1G East			2			OPA			ROPA/Preferred Alternative		
		Noise Level	NAC Impact?	Noise Level	Change	Impact?	Noise Level	Change	Impact?	Noise Level	Change	Impact?	Noise Level	Change	Impact?	Noise Level	Change	Impact?	Noise Level	Change	Impact?	Noise Level	Change	Impact?	Noise Level	Change	Impact?	Noise Level	Change	Impact?
782	66	46	No	48	2	No	48	2	No	48	2	No	48	2	No	48	2	No	48	2	No	48	2	No	48	2	No	48	2	No
786	66	54	No	57	3	No	58	4	No	58	4	No	58	4	No	58	4	No	58	4	No	57	3	No	57	3	No	57	3	No
787	66	45	No	48	3	No	50	5	No	50	5	No	50	5	No	50	5	No	50	5	No	53	8	No	53	8	No	53	8	No
788	66	45	No	46	1	No	46	1	No	46	1	No	46	1	No	46	1	No	46	1	No	48	3	No	48	3	No	48	3	No
792	66	44	No	44	0	No	45	1	No	45	1	No	45	1	No	45	1	No	45	1	No	49	5	No	49	5	No	49	5	No
793	66	44	No	44	0	No	45	1	No	45	1	No	45	1	No	45	1	No	45	1	No	48	4	No	48	4	No	48	4	No
796	66	44	No	44	0	No	45	1	No	45	1	No	45	1	No	45	1	No	45	1	No	50	6	No	50	6	No	50	6	No
797	66	44	No	44	0	No	45	1	No	45	1	No	45	1	No	45	1	No	45	1	No	49	5	No	49	5	No	49	5	No
801	66	48	No	51	3	No	50	2	No	50	2	No	50	2	No	50	2	No	50	2	No	54	6	No	54	6	No	55	7	No
802	66	52	No	54	2	No	52	0	No	52	0	No	55	3	No	52	0	No	52	0	No	55	3	No	55	3	No	55	3	No
803	66	50	No	54	4	No	51	1	No	51	1	No	53	3	No	51	1	No	51	1	No	55	5	No	55	5	No	55	5	No
804	66	51	No	54	3	No	53	2	No	53	2	No	54	3	No	53	2	No	53	2	No	55	4	No	55	4	No	55	4	No
805	66	51	No	53	2	No	53	2	No	53	2	No	54	3	No	53	2	No	53	2	No	55	4	No	55	4	No	55	4	No
806	66	44	No	44	0	No	45	1	No	45	1	No	45	1	No	45	0	No	45	0	No	49	5	No	49	5	No	49	5	No
807	66	44	No	44	0	No	45	1	No	45	1	No	45	1	No	45	0	No	45	0	No	49	5	No	49	5	No	49	5	No
809	66	46	No	48	2	No	48	2	No	49	3	No	49	3	No	48	2	No	49	3	No	50	4	No	50	4	No	50	4	No
810	66	45	No	47	2	No	47	2	No	48	3	No	48	3	No	47	2	No	48	3	No	50	5	No	50	5	No	50	5	No
811	66	46	No	47	1	No	48	2	No	48	2	No	49	3	No	48	2	No	48	2	No	50	4	No	50	4	No	50	4	No
812	66	45	No	47	2	No	49	4	No	51	6	No	49	4	No	49	4	No	51	6	No	50	5	No	50	5	No	50	5	No
813	66	46	No	47	1	No	48	2	No	50	4	No	49	3	No	48	2	No	50	4	No	50	4	No	50	4	No	50	4	No
814	66	46	No	47	1	No	48	2	No	50	4	No	49	3	No	48	2	No	50	4	No	50	4	No	50	4	No	50	4	No
815	66	46	No	48	2	No	48	2	No	49	3	No	49	3	No	48	2	No	49	3	No	49	3	No	49	3	No	49	3	No
816	66	46	No	48	2	No	48	2	No	50	4	No	49	3	No	48	2	No	50	4	No	49	3	No	49	3	No	49	3	No
817	66	46	No	47	1	No	49	3	No	51	5	No	49	3	No	49	3	No	51	5	No	50	4	No	50	4	No	50	4	No
818	66	45	No	47	2	No	49	4	No	51	6	No	49	4	No	49	4	No	51	6	No	49	4	No	49	4	No	49	4	No
MS-12	66	64	No	64	0	No	64	0	No	64	0	No	64	0	No	64	0	No	64	0	No	61	-3	No	64	0	No	64	0	No
Knights of Columbus Ballfield	66	62	No	62	0	No	62	0	No	62	0	No	62	0	No	62	0	No	62	0	No	62	0	No	62	0	No	62	0	No

Table III-34
Predicted Design Year Noise Level Impacts

Alternative	NAC Impacts	WV Substantial Increase Impacts	Impacted Receptors
No-Build	10	0	1, 2, 29, 33, 35, 53, 55, 57, 58, 59
1D West	8	0	1, 2, 29, 53, 55, 57, 58, 59
1D East	8	0	1, 2, 29, 53, 55, 57, 58, 59
1E	7	0	1, 29, 53, 55, 57, 58, 59
1G West	7	0	1, 29, 53, 55, 57, 58, 59
1G East	7	0	1, 29, 53, 55, 57, 58, 59
OPA[1]	8	0	1, 29, 53, 55, 57, 58, 59, 113
2[1]	7	0	1, 29, 53, 55, 57, 58, 59
ROPA/Preferred Alternative[1]	7	0	1, 29, 53, 55, 57, 58, 59

[1] With the ROPA/Preferred Alternative, the OPA, or Alternative 2, the Truck Route would not impact any additional receptors.

3.5.5.4 Mitigation Measures

In accordance with 23 CFR 772, noise abatement measures for the reduction or elimination of noise impacts along a proposed highway corridor must be considered for those noise sensitive locations that receive an impact. FHWA and WVDOT specify several types of mitigation to be studied for areas warranting noise abatement consideration. These include traffic management measures, changes in horizontal and vertical alignment of the proposed roadway, acquisition of property rights for construction of noise barriers/construction of earth berms/sound walls, creation of buffer zones, sound insulation for public institutions, and other considerations as warranted under 23CFR772.13 (d).

A preliminary mitigation (barrier) analysis was conducted for the modeled impacted receptor sites under each of the proposed Build Alternatives. Guidance criteria established under WVDOT policy for barrier reasonableness and feasibility were followed in determining whether the barriers could be implemented as noise abatement measures.

There were no practical noise abatement measures that would eliminate or reduce the traffic noise impacts at these receptor locations under WVDOT policy for barrier reasonableness and feasibility. The impacted receptors were eliminated from further noise abatement consideration (sound barriers) for one or more of the following reasons:

- Isolated or single receptor locations that would not typically warrant further consideration because of the potential cost of protecting one site;
- Areas with only a few homes which did not have acceptable cost per receptor ratios;
- Areas where the predicted noise contributions coming from other roadways would have precluded a sufficient Insertion Loss (IL) from any proposed noise abatement structure; and
- Overriding direct access requirements to existing roadways.

In general, sound barriers for any of the proposed Build Alternatives were found to be ineffective in reducing traffic noise levels (insufficient IL) for any of the impacted receptors. This was due to the close proximity of US 219 to each of the receptors, whereby the overriding traffic noise contribution from US 219 prevented any sufficient IL from occurring at the impacted receptors by a sound barrier along the proposed Build Alternatives. Additional sound barriers located between the different receptor locations and US 219 would not be feasible due to the direct access requirements (driveways and entrances) from the highway to the residential properties.

The redirecting of truck traffic through the use of the Truck Route, as proposed with the ROPA/ Preferred Alternative, the OPA, or Alternative 2, is forecasted to decrease truck traffic through downtown Thomas by as much as 80 percent (see *Section 3.2.1 Economic Environment*). This reduction would lower noise levels by as much as six (6) decibels in the downtown area (as modeled at receptor site M-12, Table III-32). This would be a "noticeable" improvement (as discussed above) in the noise environment within this area.

3.5.6 ENERGY

The 1996 Corridor H FEIS included a detailed computational analysis of the predicted transportation-related energy consumption for the 100-mile long Corridor H Project. The analysis presented below was conducted to compare energy requirements for each of the Parsons-to-Davis Build Alternatives. The following three categories of energy consumption were analyzed: construction, maintenance, and operational.

3.5.6.1 Methodology

Construction-related energy consumption is based on the construction cost of the roadway alternatives. The energy analysis methodology was developed for the FHWA by the California Transportation (CALTRANS) Laboratory (California Department of Transportation, 1983). It determines the total amount of British Thermal Units (BTUs) required for the production and placement of materials (earthwork, asphalt, structures, etc.) based on the project's construction cost. These BTU estimates are then converted to quantities of gasoline. Approximately 125,000 BTUs equal 1 gallon of fuel.

3.5.6.2 Existing Environment

The existing energy consumption environment is normally not analyzed. Construction energy requirements do not apply for the base year (1999). However, maintenance and operational energy consumption quantities can be computed for informational and comparative purposes. The primary roadway network within the Study Area was analyzed for both maintenance and operational energy consumption. The roadway network was comprised of US 219 extending from Mackeyville Road to the WV 32 intersection at Thomas, then northward along US 219 for 0.95 mile and a segment of WV 32 from the US 219 intersection to the WV 93 interchange. The 1999 average daily fuel consumption for these roadway segments was calculated to be 1,140 gallons, while the maintenance energy requirement for these same roadway segments was calculated to be 23,700 gallons of fuel, annually.

3.5.6.3 Impacts

Table III-35 summarizes the construction, maintenance and operational energy requirements for each of the alternatives for the ten-year period between 2010 and 2020. The ROPA/Preferred Alternative would consume an estimated 175,755,700 gallons of fuel over the ten-year period (total fuel consumption). Alternative 2 is predicted to consume the greatest amount of energy of all the alternatives during the ten-year period (over 207 million gallons of fuel). The OPA is predicted to consume the least amount of total energy of all the Build Alternatives (172,369,100 gallons of fuel). It is important to note that the Truck Route, which would allow for truck traffic to bypass the town of Thomas, was included as part of the overall alignment for the ROPA/Preferred Alternative, the OPA, and Alternative 2 in the energy analysis. Of the total energy consumption for the ROPA/Preferred Alternative, approximately 16 percent is due to the Truck Route component. Even with this component included in its alignment, the total energy expended on the ROPA/Preferred Alternative is less than any of the other Build Alternatives, except for the OPA alignment. As described in the 1996 Corridor H FEIS, the No-Build Alternative would not impact energy usage in the Study Area.

Table III-35
Energy Consumption for the Ten Year Period 2010 to 2020 (in gallons of fuel)

Alternative	Construction Energy	Maintenance Energy	Operational Energy	TOTAL Energy
No-Build	N/A	237,000	6,215,900	6,452,900
1D West	180,057,300	430,100	19,834,800	200,322,200
1D East	176,842,000	422,400	19,462,100	196,726,500
1E	165,588,400	395,500	18,034,200	184,018,100
1G West	178,449,600	426,200	19,659,700	198,535,500
1G East	175,234,300	418,600	19,287,000	194,939,900
ROPA/Preferred Alternative	160,765,400	384,000	14,606,300	175,755,700
OPA	157,550,100	385,900	14,433,100	172,369,100
2	189,703,200	462,700	17,815,200	207,981,100

ROPA/Preferred Alternative, OPA, and Alternative 2 include the Truck Route as part of the overall alignment.
N/A – Not Applicable

3.5.6.4 Avoidance, Minimization, & Mitigation Measures

Mitigation measures for energy consumption are normally not employed, primarily due to the avoidance of environmentally sensitive areas and single-family residences, as well as basic highway engineering laws. However, recovery of the construction energy may be calculated to predict when the benefits gained by the predicted operational consumption equals or exceeds the construction energy loss.

This project is intended to attract people into the surrounding area; therefore, recovery of the construction energy that would normally result from the relief of congestion is not applicable to this project. However, energy that is not predicted to be used for this project may have to be used for other roadway improvements if Corridor H is not constructed.

3.6 RELATIONSHIP OF LOCAL SHORT-TERM USES VERSUS LONG-TERM PRODUCTIVITY

The construction phase of the project would cause limited adverse effects on the environment, which would be short-term. Adverse effects have been evaluated in detail and mitigation measures identified. In addition, careful attention would be given to the problems identified during final design. Proposed mitigation measures, some temporary and some permanent, would minimize adverse short-term effects and avoid any substantial long-term damage.

The project would be classified as a long-term productive facility. This project, with its desirable design characteristics, would provide for safe and efficient vehicle operation for present and future traffic volumes. The benefits such as reduced operating costs, reduced travel time, reduced accidents, and general economic enhancement of the area, offered by the long-term productivity of this project, should more than offset the short-term inconvenience and adverse effects on the human environment.

3.7 IRREVERSIBLE & IRRETRIEVABLE COMMITMENTS OF RESOURCES

Implementation of any of the Build Alternatives carried forward for detailed analysis would involve a commitment of a range of natural, physical, human, and fiscal resources. Land used in the construction of the proposed facility is considered an irreversible commitment during the period that the land is used for a highway facility. However, if a greater need arises for the use of the land, or if the highway facility is no longer needed, the land can be converted to another use. At present, there is no reason to believe such a conversion would be necessary or desirable.

Considerable amounts of fossil fuels, labor, and highway construction materials such as cement, aggregate, and bituminous material would be expended. In addition, large amounts of labor and natural resources would be used in the fabrication and preparation of construction materials. These materials are not generally retrievable; however, they are not in short supply, and their use would not have an adverse effect upon continued availability of these resources. Any construction would also require a substantial one-time expenditure of both state and federal funds, which are not retrievable.