REEVALUATION FOR
CORRIDOR Q OVERLAP PHASE A

State Project # 0121-013-793, P102, R201, C501, D601; UPC 90282
From: Route 614    To: Route 604
Buchanan County

Submitted pursuant to 42 USC § 4332(2)(c) and 23 CFR 771.129(c)

Prepared for
Federal Highway Administration
by
Virginia Department of Transportation
Environmental Division
1401 East Broad Street
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1. INTRODUCTION

The Virginia Department of Transportation (VDOT), in cooperation with the Federal Highway Administration (FHWA), has prepared this Reevaluation for Corridor Q Overlap Phase A, which extends approximately 2.8 miles from Route 614 to Route 604 in Buchanan County, Virginia, as shown in Figure 1. Corridor Q Overlap Phase A is part of Corridor Q of the Appalachian Development Highway System (ADHS) and also part of US 121 Section IIIB. The overlap is illustrated in Figures 2 and 3.

The ADHS was created by Congress to bring better transportation to isolated regions of Appalachia across portions of 13 states. Corridor Q of the ADHS traverses portions of Kentucky, Virginia, and West Virginia, generally following the existing US 460 corridor, with some sections on new location off of existing US 460. US 121 is a new highway initiated by Congress that would generally parallel the VA 83 corridor from US 23 in the Town of Pound to the West Virginia State Line. In October 2010, the Appalachian Regional Commission (ARC) approved the realignment of 13.1 miles of Corridor Q that follows US 460 in Buchanan County between the Kentucky-Virginia state line and the Town of Grundy to coincide with (i.e., overlap or follow the same alignment as) the US 460 Connector, Section IIIA of US 121, and a portion of Section IIIB of US 121. Where Corridor Q and US 121 overlap, the roadway would be dually designated and signed as US 460 and US 121.

An Environmental Studies document (VDOT, 2014) was prepared in 2014 by VDOT for US 121 Section IIIB to address modifications to the corridor location that was established originally in the 2001 Final Environmental Impact Statement (FEIS) and Record of Decision (ROD) (FHWA, 2001). The selected alternative identified in the ROD was Alternative F1. The proposed realigned corridor was referred to in the Environmental Studies document as Alternative F1 Modified. Except for the crossings of Poplar Creek and Levisa Fork, Alternative F1 Modified was represented in the Environmental Studies document as a 750-foot-wide corridor, which was the same width as the alternative corridors studied in the FEIS and therefore allowed for estimating and comparing impacts of Alternative F1 and Alternative F1 Modified on an equal basis. Crossings of Poplar Creek and Levisa Fork were anticipated to be on bridges and a narrower corridor was used to represent these locations in order to reflect the reduced impacts associated with bridge crossings. A location public hearing was held on September 23, 2014. The Commonwealth Transportation Board (CTB) on February 18, 2015 approved the location of Alternative F1 Modified for Section IIIB, limited to the 4.1 mile portion that overlaps Corridor Q of the ADHS. FHWA on July 20, 2015 concluded that no new significant environmental impacts were associated with Alternative F1 Modified within the Corridor Q/Section IIIB Overlap. Therefore, FHWA determined pursuant to 23 CFR 771.130(c) that a supplemental Environmental Impact Statement would not be necessary for Alternative F1 Modified within the Corridor Q/Section IIIB Overlap. Further, FHWA approved the location of Alternative F1 Modified within the Corridor Q/Section IIIB Overlap and indicated that the project could proceed to subsequent development.
Figure 1. Corridor Q Overlap Phase A
Figure 2. Relationship between ADHS Corridor Q and US 121
Figure 3. Corridor Q Overlap Phase A Access
FHWA did not take a position on the environmental impacts of Alternative F1 Modified outside of the Corridor Q Overlap. Nor did FHWA approve the location of Alternative F1 Modified in Section IIIB outside of the Corridor Q Overlap. FHWA also noted that National Environmental Policy Act (NEPA) documentation would need to be reevaluated prior to final design, acquisition of right of way, and construction.

Based on the approvals, VDOT then proceeded with project development, which included a detailed construction cost analysis. The analysis concluded that the cost of completing the Corridor Q Overlap portion of Section IIIB would be greater than the amount of allocated funds. Consequently, the project was split into two phases (Phase A and Phase B) and changes to the project concept were made to enable construction of a useable portion of the project with the available funds. On July 6, 2016, VDOT amended the agreement with the Design-Build Team (DBT) to provide for the design and construction of the 4.1-mile section in phases. The amendment obligated the DBT to design and construct Phase A, extending approximately 2.8 miles from Route 614 to Route 604, which is the subject of this Reevaluation. VDOT and the DBT intend to enter into subsequent design-build contract(s) to design and construct the remainder of the section, Phase B as shown in the inset of Figure 1, as funding allows and in substantially the same manner, with such changes as are appropriate to reflect the differences in the work to be performed. Accordingly, Corridor Q Overlap Phase A is the focus of this environmental Reevaluation. Corridor Q Overlap Phase B would be advanced and be the subject of a separate environmental Reevaluation when funding is identified and Phase B moves forward.

This Reevaluation has been prepared in accordance with provisions of NEPA and 23 CFR 771.129(c) to assess the environmental consequences resulting from changes to Phase A of the proposed project, changes in the affected environment, and changes in regulatory requirements and guidance since location approvals by the CTB (February 18, 2015) and FHWA (July 20, 2015). Since FHWA’s location approval, design modifications for Phase A have been initiated to reduce project cost, including the following:

- Reduction of the roadway typical cross section from four lanes to two lanes with a truck climbing lane where necessary.
- Modification of connections to existing roadways. Instead of connecting with Route 614 (Woods Fork) as previously proposed, Corridor Q Overlap Phase A would connect to Route 604 (Poplar Creek Road). Route 614 would be severed where the new road crosses and turn-arounds would be provided on both sides of the new road. The intersection of Route 604 and Route 615 (Hoot Owl Street) would be modified due to the new intersection of Corridor Q Overlap Phase A with Route 604.
- Replacement of the previously proposed bridge spanning Route 604 and Poplar Creek with a roadway embankment and box culvert.

Throughout this Reevaluation, “Environmental Studies document” refers to the 2014 documentation comparing the impacts of Alternative F1 Modified with Alternative F1 for the entirety of US 121 Section IIIB. “Corridor Q Overlap Phase A” refers to the preliminary design footprint between the nominal limits of Route 614 and Route 604, plus an extension west of Route 614 to cover a short portion of US 121 Section IIIA (Hawks Nest) that was not included in the rough grade construction of that section, and a short extension east of Route 604 to cover the Route 604 connection area. Impacts of Corridor Q Overlap Phase A are compared with the impacts of the corresponding section of Alternative F1 Modified (i.e., the section of Alternative F1 Modified...
between the same limits). Therefore, when comparing impacts in Section 4, Environmental Consequences, of this Reevaluation, the term “Alternative F1 Modified” pertains only to that segment corresponding to Corridor Q Overlap Phase A.

2. BACKGROUND

FHWA, in accordance with provisions of NEPA and 23 CFR 771, completed a Final Environmental Impact Statement (FEIS) in September 2001 and signed a Record of Decision (ROD) in November 2001 for the proposed US 121. The FEIS covered the full 59 miles of the proposed new four-lane divided US 121 roadway across Wise, Dickenson, and Buchanan Counties from US 23 at the Town of Pound to VA 83 at the West Virginia state line. The ROD identified Alternative F1 as the selected alternative. The ROD also noted that the project would be designed and constructed in numerous phases and stated that:

Each phase will ultimately contribute to the project's overall purpose and need. Sequential design and construction of large projects is consistent with FHWA regulations and guidance.

On January 11, 2002, VDOT entered into a Comprehensive Agreement and Design-Build Contract in accordance with the Virginia Public-Private Transportation Act (PPTA) for the design, construction, and maintenance of US 121. By 2005, however, at a time when VDOT was struggling with declining revenues and budget cuts, cost estimates for constructing the highway had escalated beyond available funding sources and it became apparent that the project could not advance until another implementation strategy or additional funding sources could be identified.

VDOT then became aware of a project in West Virginia that was utilizing a construction concept referred to as “coal synergy” and decided to determine if the concept could be applied to the US 121 project in order to move the project forward. Coal synergy is an innovative concept that utilizes large-scale earth moving equipment and techniques common to the mining industry and revenue from incidental coal recovery within the project construction area to offset roadway construction costs, thereby reducing the expenditure of public funds to construct the highway. Thereafter, on January 11, 2006, VDOT entered into an assignment and assumption agreement with private contractors (hereafter referred to as the Design Build Team, or DBT) for development of the project using a coal synergy approach. The DBT was tasked by VDOT to develop modifications to the selected Alternative F1 that would best facilitate construction of US 121 using the coal synergy approach.

- As VDOT considered applying the coal synergy approach to accelerate implementation of the proposed road, FHWA concurred with the identification of five sections of independent utility within the original US 121 corridor (Section I, Section II, Section IIIA, Section IIIB, and Section IIIC). Each section was of sufficient length to address environmental matters on a broad scope and each would provide a serviceable facility regardless of whether other US 121 sections are constructed. VDOT and FHWA undertook review of each section under FHWA’s NEPA regulations to evaluate the environmental consequences of modifying the selected Alternative F1 under the coal synergy approach. The status of each section is listed below.

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1 Following a series of location public hearings in April 2000, the CTB endorsed Alternative F1 in August 2000 and designated the future Coalfields Expressway (CFX) as US Route 121 in Virginia.
2 Additional information on the sections of US 121 can be found at: http://www.virginiadot.org/projects/bristol/route_121.asp.
- **Section I** is approximately 2.5 miles long and extends from US 23 to VA 83, connecting with Section II east of the Town of Pound. An environmental Reevaluation (VDOT, 2008a) was conducted for this section to address minor corridor shifts. FHWA concurred with the Reevaluation on January 8, 2009. Location public hearings were held on August 13 and August 14, 2012 and the CTB approved the revised location of the corridor on February 20, 2013. Funding for construction is not currently programed for this section, and therefore no work is taking place on this section.

- **Section II** is approximately 26 miles long and extends from the east end of Section I east of the Town of Pound to the west end of Section IIIA where it would intersect with the US 460 Connector Phase II that is currently under construction. A Draft Supplemental EIS was completed for Section II and approved by FHWA on June 6, 2016 (FHWA, 2016a). Further advancement of this section is dependent on identification of funding.

- **Section IIIA**, also referred to as the Hawks Nest section, is approximately 2.5 miles long and runs from the US 460 Connector Phase II (currently under construction) to Route 614. An environmental Reevaluation for Section IIIA was completed to address modifications to the corridor location and changes to design features (VDOT, 2008b). FHWA concurred with the Reevaluation on March 26, 2008. Section IIIA, except for a portion on the east end, was constructed to rough grade concurrently with the Hawks Nest surface coal mining operation (construction completed July 2011). VDOT’s FY 2017-2022 Six-Year Improvement Program includes funding for paving, which would be completed in conjunction with the US 460 Connector Phase II. As noted in the Introduction, US 121 Section IIIA is also part of Corridor Q. Although the nominal eastern terminus of Section IIIA was Route 614 where there would have been a connection, the proposed changes associated with Corridor Q Overlap Phase A would move the connection previously proposed at Route 614 approximately 1.9 miles eastward to Route 604. Notwithstanding, even if Corridor Q Overlap Phase A is not constructed, Section IIIA still would have a connection to the local road system. Southern Gap Road, also known locally as the Buchanan County Industrial Development Authority Access Road, has been completed between Route 604 and VA 83 where it is designated as Route 744. Between Route 604 and Corridor Q/Section IIIA Overlap, Southern Gap Road has been constructed to rough grade. When Corridor Q/Section IIIA Overlap is completed and paved, so will Southern Gap Road be completed and paved, providing a connection between Corridor Q and the local road network and the development that has occurred on portions of the former Hawks Nest mine site.

- **Section IIIB**, from the east end of Section IIIA to Route 643, is approximately 15 miles in length. As described in the Introduction, an Environmental Studies document for Section IIIB was completed in August 2014 to address proposed shifts of the corridor from the original selected Alternative F1 to Alternative F1 Modified. The location of Alternative F1 Modified is similar to the location of Alternative F1 that was selected in the ROD (approximately 30% of the total length overlaps and the remainder is generally parallel to and offset by up to 1.5 miles at the farthest point). As previously indicated in the Introduction, a location public hearing was held and the CTB and FHWA approved the location of Alternative F1 Modified for Section IIIB limited to the 4.1-mile-long portion that overlaps Corridor Q of the Appalachian Regional Commission’s (ARC) Appalachian Development Highway System (ADHS). This 4.1 mile section (also referred to as the “Poplar Creek” section) extends from the junction of Sections IIIA and IIIB at Route 614 to existing US 460 at the Town of Grundy. The approved location of the remaining portion of Section IIIB of US 121 outside of the...
Corridor Q overlap area remains on the Alternative F1 corridor as originally approved by the CTB on August 17, 2000 and FHWA in the November 13, 2001 ROD. The Corridor Q Overlap Phase A portion is funded for design and construction. Funding is not currently programmed for construction of Phase B of the Corridor Q Overlap or for the remainder of Section IIIB outside of the Corridor Q Overlap.

- **Section IIIC**, also known as the Rockhouse Section, is approximately 5 miles in length and extends from Route 643 to the West Virginia state line at existing VA 83, from where the West Virginia Department of Transportation’s Coalfields Expressway would continue northeastward toward Beckley, West Virginia. An environmental Reevaluation to address minor corridor shifts for Section IIIC was completed (VDOT, 2008c) and concurred in by FHWA on October 29, 2008. A location public hearing was held on November 20, 2008. On February 5, 2009, the CTB approved the revised location of the corridor as presented at the public hearing. Funding for construction is not currently programmed for this section, and therefore no work is taking place on this section.

Corridor Q of the ADHS is complete in West Virginia and complete or under construction in Kentucky. In Virginia, Corridor Q is complete from Grundy eastward. (ARC, 2015) The remaining uncompleted portions of Corridor Q in Virginia are all on the overlap sections of US 460 Connector and US 121 Sections IIIA and IIIB, as shown on Figure 2 and as summarized below. Corridor Q Overlap Phase B is the only portion of Corridor Q in Virginia that currently remains unfunded for construction.

- US 460 Connector Phase I (approximately 1 mile) - construction completed September 2015.
- US 460 Connector Phase II (approximately 6.2 miles) – fully funded, construction began in October 2015; completion of rough grade expected May 2019, paving scheduled for 2020.
- US 121/US 460 Connection (approximately 0.3 miles) – fully funded, comprehensive agreement for design and construction in negotiations.
- US 121/US 460 Hawks Nest (approximately 2 miles) – construction completed to rough grade June 2011; comprehensive agreement for paving in negotiations; anticipated start date for paving May 2018.
- US 121/US 460 Poplar Creek Phase A (approximately 2.9 miles) – fully funded for rough grade construction and paving; design/build contract signed with Bizzack Construction July 2016; provides at grade connection with Route 604.
- US 121/US 460 Poplar Creek Phase B (approximately 1.6 miles) – currently unfunded; scope includes 2 lane roadway with climbing lanes as needed with bridge over Levisa Fork; connects with existing US 460 at Grundy to complete Corridor Q.

3. **TRAFFIC ANALYSIS**

The forecasted traffic volume on Corridor Q Overlap Phase A for the design year 2040 (approximately 14,970 vehicles per day) is similar to the forecasted volume for the year 2035 (approximately 14,600 vehicles per day) presented in the 2014 Environmental Studies document. The difference is approximately 2.5 percent.

The design modifications that have been made to Corridor Q Overlap Phase A include a change in the location of a connection to the local roadway network. As presented in the 2014 Environmental Studies document, Corridor Q Overlap would have a connection to Route 614. The current design shifts this connection to Route 604 just north of Route 615 as shown on Figure 3. Additionally, Route 614 would be severed where it is crossed by Corridor Q Overlap Phase A and turnarounds
would be provided on both sides of the new Corridor Q roadway. The roadway distance on Corridor Q Overlap Phase A between the previously proposed connection and the revised proposed connection is approximately 1.9 miles. Because the area surrounding the project has low densities of population and land development, this relatively small distance is expected to result in shifting travel patterns for localized trips only. See the Traffic Technical Memorandum (VDOT, 2016a) for a detailed analysis.

The reduction in the width of the typical cross section from four-lane divided to two lanes plus climbing lane would reduce the traffic capacity of the highway. An at-grade intersection of the type proposed for Route 604 onto the limited access Corridor Q/US 460/US 121 highway would introduce a conflict point that could potentially affect traffic safety. The proposed configuration of Route 604 would contain design elements that would not meet VDOT and American Association of State Highway and Transportation Officials (AASHTO) standards for horizontal and vertical alignment that are typical for highways with the same functional classification as Route 604 (rural minor collector). Accordingly, FHWA’s approvals of the necessary variances and design exceptions were premised on a satisfactory level of service and a reasonable level of safety being provided. To ensure that the proposed highway would be adequate for the predicted type and volume of traffic, VDOT evaluated the anticipated level of service (LOS) on Corridor Q Overlap Phase A. VDOT also conducted detailed crash analyses on both Corridor Q Overlap Phase A and Route 604, along with geometric design considerations and comparative cost analyses. VDOT also proposed features to mitigate the reduced design criteria for Route 604, including the provision of left and right turn lanes from Corridor Q Overlap Phase A to Route 604, widened curves with paved shoulders to accommodate larger vehicles, and enhanced warning signage relative to curvature and grade. Based on the provided data, FHWA approved the variances and design exceptions. (VDOT, 2016b; VDOT, 2016c; FHWA, 2016b)

4. ENVIRONMENTAL CONSEQUENCES

As illustrated in Figure 1, the corridor location for Alternative F1 Modified was represented in the 2014 Environmental Studies document as a 750-foot-wide corridor, with the exception of the Poplar Creek crossing, where a bridge structure was proposed. A narrower corridor was used to represent the bridge in order to reflect the lower environmental impacts associated with using a bridge at the Poplar Creek crossing instead of earth fill for road embankment. Likewise, displays and other information at the September 23, 2014 location public hearing reflected a bridge crossing at Poplar Creek. In contrast, a preliminary roadway design is now available for Corridor Q Overlap Phase A. The preliminary design reflects changes in the typical cross section, changes in connections to existing roads, and the replacement of the previously proposed Poplar Creek bridge with a box culvert and embankment. Figure 1 also illustrates the changed footprint of the project as a result of the design. The new footprint reflects estimated construction limits, proposed right of way limits, and proposed acquisition limits of residual parcel remnants.

The proposed right of way encompasses the land necessary to construct, maintain, and operate the roadway. As such, the proposed right of way represents the limits within which land disturbance may occur for Corridor Q Overlap Phase A and is therefore used for purposes of quantifying direct physical impacts in this Reevaluation. During the identification of proposed right of way limits, an assessment also was conducted of the need to acquire residual parcel remnants (Bizzack, 2016a). VDOT is authorized by state law to acquire such remnants when any of the following conditions apply: 1) the remnant can no longer be utilized for the purpose for which the entire
tract is being utilized; 2) the highway project will leave the remnant without a means of access to a public highway; 3) the remnant is determined by VDOT to have little or no value or utility to the owner (referred to an “uneconomic remnant”). (VDOT, 2016d) The limits of acquisitions of these remnants are designated on project plans as “proposed acquisition” instead of “proposed right of way.” Notwithstanding, landowners may elect to keep ownership of the remnants, in which case the remnants would not be acquired. Final determinations of the acquisitions would not be made until the right of way acquisition stage.

As shown in Figure 1, the proposed right of way and limited access footprint of Corridor Q Overlap Phase A is largely, but not entirely, contained within the original 750-foot-wide location study corridor for Alternative F1 Modified. Corridor Q Overlap Phase A has a variable width that reflects the actual cut and fill construction limits, with some locations having a narrower and some having a wider footprint than the uniform 750-foot-wide corridor assumed for Alternative F1 Modified. The largest difference in the footprints of Corridor Q Overlap Phase A and Alternative F1 Modified is at the Route 604/Poplar Creek crossing.

The nominal western terminus of Corridor Q Overlap Phase A is Route 614; however, the project area has been extended westward approximately 1,500 feet in this location. The extension encompasses part of US 121 Section IIIA (shown in orange in Figure 1, to the west of Corridor Q Overlap Phase A) and it is the only portion of Section IIIA that remains to be constructed to rough grade. It has been included in this Reevaluation for Corridor Q Overlap Phase A in order to complete the connection between these two sections of US 121/US 460/Corridor Q.

Existing environmental conditions have changed along one portion of the project corridor where there is now an active surface coal mining operation. Areas along other portions of the project corridor remain primarily forested with limited residential or commercial development occurring along secondary roads including Routes 604 and 614. Table 1 quantifies and compares impacts between Corridor Q Overlap Phase A and the portion of Alternative F1 Modified that equates to Corridor Q Overlap Phase A. Individual sections following the table provide more specific information for each resource pertinent to the impact analyses.

### Table 1. Summary of Impacts

<table>
<thead>
<tr>
<th>Category</th>
<th>Alternative F1 Modified Corridor Footprint</th>
<th>Corridor Q Overlap Phase A Right of Way Footprint</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Area within Alternative (acres)</td>
<td>177</td>
<td>284</td>
</tr>
<tr>
<td>Homes</td>
<td>4</td>
<td>22</td>
</tr>
<tr>
<td>Businesses</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Schools</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Churches</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Other Community Facilities (rescue squads, fire stations, etc.)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Cemeteries</td>
<td>0</td>
<td>1 (Cantrell Cemetery)</td>
</tr>
<tr>
<td>Prime and Unique Farmland (acres)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Forest (acres)</td>
<td>163</td>
<td>229</td>
</tr>
<tr>
<td>Section 4(f) Property (acres)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Parks and Recreational Resources</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Reevaluation for  
Corridor Q Overlap – Phase A

<table>
<thead>
<tr>
<th>Category</th>
<th>Alternative F1 Modified Corridor Footprint</th>
<th>Corridor Q Overlap Phase A Right of Way Footprint</th>
</tr>
</thead>
<tbody>
<tr>
<td>Historic Properties affected</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Number of Stream Crossings</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Length of Streams (miles)</td>
<td>0.29</td>
<td>1.53</td>
</tr>
<tr>
<td>Wetlands (acres)</td>
<td>0</td>
<td>0.03</td>
</tr>
<tr>
<td>Open Water (acres)</td>
<td>0</td>
<td>0.23</td>
</tr>
<tr>
<td>Floodplains filled (acres)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Noise Impacts (Receptors Impacted)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Hazardous Material Sites Impacted</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

The most notable changes in impacts are increases in the total right of way area, number of homes displaced, area of forest impact, and length of stream impacts. Also of note is the displacement of a cemetery. These differences are mostly attributable to the larger area needed now to accommodate a box culvert and road fill instead of a bridge at Poplar Creek and to accommodate a connection with Route 604, where no connection was proposed before.

4.1 Socioeconomics, Land Use, and Right of Way/Relocation

4.1.1 Land Use

With the exception of a new surface coal mine operation, land uses along Corridor Q Overlap Phase A are consistent with the uses found along Alternative F1 Modified. Most of the area remains primarily forested with limited residential or commercial development occurring in some areas along secondary roads such as Routes 604 and 614. Barren land and grassland also occur in small amounts. Table 2 lists the existing (based on the most recently available National Land Cover Dataset) land uses within the Corridor Q Overlap Phase A proposed right of way footprint. These land uses would be converted to transportation use.

The surface coal mine was permitted September 10, 2015 by the Virginia Department of Mines, Minerals and Energy (DMME) and mining is underway in areas near the project (Bizzack, 2016b). The approved limits of the mine cover an area of approximately 224 acres, approximately 34 acres of which overlap the proposed right of way for Corridor Q Overlap Phase A. Mining within the portion in the proposed right of way area and the reclamation required under the permit are expected to be completed prior to acquisition of the land by VDOT for highway purposes (Bizzack 2016b). Reclamation would consist of the mining company returning the land to approximate original contours and reforestation. Construction of the road then would require coordinating with the mining company and DMME for a modification of the mining permit for a change in post-mining land use from reclaimed mine land to highway use pursuant to DMME surface coal mining regulations.

Table 3 lists existing land uses within the additional areas of acquisition of parcel remnants. These lands would be acquired, but not converted to highway use because they are beyond the right of way limits needed for construction and maintenance of the highway. Accordingly, these lands would not be expected to be disturbed, unless done prior to acquisition (e.g., as part of the active surface coal mine discussed above) or after conveyance to an adjoining property owner (VDOT often attempts to convey uneconomic remnants to adjoining property owners). Approximately 30 acres of the surface coal mine described above overlap the additional acquisition areas.
Table 2. Land Use/Land Cover in Corridor Q Overlap Phase A Proposed Right of Way

<table>
<thead>
<tr>
<th>Land Use/Land Cover Classification</th>
<th>Within Proposed Right of Way Corridor Q Overlap Phase A (Acres)</th>
<th>Percent of Total Proposed Right of Way Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developed, Open Space*</td>
<td>11</td>
<td>3.87%</td>
</tr>
<tr>
<td>Developed, Low Intensity*</td>
<td>8</td>
<td>2.82%</td>
</tr>
<tr>
<td>Developed, Medium Intensity*</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Developed, High Intensity*</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Barren Land</td>
<td>11</td>
<td>3.87%</td>
</tr>
<tr>
<td>Deciduous Forest</td>
<td>228</td>
<td>80.28%</td>
</tr>
<tr>
<td>Evergreen Forest</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Mixed Forest</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Shrub / Scrub</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Grassland / Herbaceous</td>
<td>26</td>
<td>9.16%</td>
</tr>
<tr>
<td>Pasture / Hay</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Cultivated Crops</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Open Water</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Total</td>
<td>284</td>
<td>100%</td>
</tr>
</tbody>
</table>

Source: Calculated from 2011 National Land Cover Dataset.

* Developed land is a mixture of constructed materials and vegetation and the category is subdivided based on amount of impervious surface. In open space, impervious surface accounts for less than 20% of total cover; low intensity, 20-49% of total cover; medium intensity, 50-79% of total cover; and high intensity, 80-100% of total cover.

Table 3. Land Use/Land Cover in Additional Acquisition Areas

<table>
<thead>
<tr>
<th>Land Use/Land Cover Classification</th>
<th>Within Additional Acquisition Areas Corridor Q Overlap Phase A (Acres)</th>
<th>Percent of Total Additional Acquisition Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developed, Open Space*</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Developed, Low Intensity*</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Developed, Medium Intensity*</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Developed, High Intensity*</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Barren Land</td>
<td>7</td>
<td>4.12%</td>
</tr>
<tr>
<td>Deciduous Forest</td>
<td>148</td>
<td>87.06%</td>
</tr>
<tr>
<td>Evergreen Forest</td>
<td>7</td>
<td>4.12%</td>
</tr>
<tr>
<td>Mixed Forest</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Shrub / Scrub</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Grassland / Herbaceous</td>
<td>8</td>
<td>4.70%</td>
</tr>
<tr>
<td>Pasture / Hay</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Cultivated Crops</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Open Water</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Total</td>
<td>170</td>
<td>100%</td>
</tr>
</tbody>
</table>

Source: Calculated from 2011 National Land Cover Dataset.
4.1.2 Executive Order 12898
There are no minority or low-income populations within or adjacent to Corridor Q Overlap Phase A. Accordingly, the project would have no disproportionately high and adverse effects on such populations under the purview of Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. See the Socioeconomics, Land Use, and Right of Way and Relocations Technical Memorandum for detailed discussion (VDOT, 2016e).

4.1.3 Displacements
No businesses, farms, or non-profit organizations would be displaced by Corridor Q Overlap Phase A or by Alternative F1 Modified. Homes, community facilities, and cemeteries in the vicinity of the project are depicted in Figure 4. Residential displacements for Corridor Q Overlap Phase A are summarized as follows (Bizzack, 2016c):

- Number of homes displaced: 22, three are located in the Route 614 area crossed by the project; two are located at the west end of Stable Drive; 17 are located in the Route 604/Poplar Creek crossing area
- Average number of persons per family: 3
- Tenure of occupants: greater than 5 years
- Types of occupancy (owner/tenant): owner occupied single family dwellings, including 13 mobile homes; There may be tenants, however, it is believed that on sites where there are multiple mobile homes family members own them
- Estimated income range: $15,000–$75,000, the median household income is estimated at $29,821 and the family median income is estimated at $38,687
- Minority and/or ethnic groups: no minorities
- Disabled persons: none known at this time; if present, VDOT will assist them by arranging meetings with realtors, banks, local government offices, etc., as needed
- Elderly persons or large families: there are several elderly persons occupying dwellings on the proposed project; VDOT does not believe there are large families occupying dwellings; however, if there are, then the relocation assistance provided will ensure that they are relocated to accommodate the family members

Alternative F1 Modified would displace the same homes as Corridor Q Overlap Phase A in the Route 614 crossing area and at the west end of Stable Drive, but would not displace any homes in the Route 604/Poplar Creek area. Therefore, Corridor Q Overlap Phase A, with its box culvert and fill concept would result in 17 additional residential displacements, 12 of which are mobile homes. However, these displacements can be mitigated by providing replacement housing and relocation assistance, as described in the next section.

4.1.4 Replacement Housing
Potential displacements would occur within one zip code area: 24614. There were approximately 37 homes for sale within this zip code area in October 2016 based on real estate listings (www.trulia.com). Therefore, housing replacement sites are available in the project area. Housing also is available in varying locations and at an array of prices within other parts of Buchanan County and in the surrounding jurisdictions. Thirteen of the displacements are mobile homes, which may aid in relocation as it would be faster and easier to provide a home in the area by relocating the mobile home.
Figure 4. Approximate Locations of Homes, Community Facilities, and Cemeteries in Vicinity of Project
Right of way acquired for Corridor Q Overlap Phase A would be purchased in accordance with established VDOT procedures and requirements of the federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended. Assurance is given that relocation resources will be available to all residential displaced without discrimination. In addition, all displaced families and individuals would be relocated to suitable replacement housing; all replacement housing would be fair housing available to all persons without regard to race, color, religion, sex, or national origin; and all replacement housing would be within the financial means of the displaced. Each person would be given sufficient time to negotiate for and obtain possession of replacement housing. No residential occupants would be required to move from property needed for the project until comparable decent, safe, and sanitary replacement dwellings have been made available to them. VDOT has the ability and, if necessary, is willing to provide housing of last resort, including the purchase of land or dwellings; repair of existing dwellings to meet decent, safe, and sanitary conditions; relocation or remodeling of dwellings purchased by VDOT; or construction of new dwellings. VDOT’s right of way brochure, A Guide for Property Owners and Tenants, outlines the right of way acquisition process (VDOT, 2011).

4.1.5 Cemeteries
Two family cemeteries are located within or near the proposed right of way of Corridor Q Overlap Phase A: the Owens Cemetery and the Cantrell Family Cemetery. The Owens Cemetery is located adjacent to Route 614. The cemetery contains 19 identifiable graves, with the oldest marked grave dating back to 1910 and the most recent dated 2015, with family names including Belcher, McClanahan, Owens, Quinley, and Stiltner. The cemetery is maintained by the current property owners, who are also descendants of the deceased. Although adjacent to the proposed right of way, the Owens Cemetery would not be disturbed by Corridor Q Overlap Phase A, based on current preliminary plans. Alternative F1 Modified also would avoid the cemetery.

The Cantrell Family Cemetery is located approximately 300 feet northwest of the intersection of Stable Drive and Route 604, and it contains 48 identifiable graves. The oldest marked grave is dated 1886 and the most recent is dated 2006, with family names including Cantrell, Rose, and Stiltner. The cemetery is maintained by the current property owners, who are also descendants of the deceased. The Cantrell Family Cemetery would be displaced by Corridor Q Overlap Phase A as a result of the earthwork required for the box culvert and road embankment. All graves would be relocated in accordance with Virginia law. (Bizzack, 2016d; S&ME, 2016). Alternative F1 Modified would not displace this cemetery because the Poplar Creek crossing would be by bridge instead of box culvert and fill. Therefore, Corridor Q Overlap Phase A, with its box culvert and fill concept would result in displacement of a cemetery with 48 graves that would not occur with Alternative F1 Modified. However, this displacement can be mitigated by relocating the graves to a suitable replacement site.

4.2 Natural Resources
4.2.1 Streams, Ponds, and Wetlands
Streams. The US Geological Survey (USGS) and the Natural Resources Conservation Service (NRCS) catalog watersheds nationwide using a hierarchical hydrologic unit code (HUC) system in which numerical codes are assigned based on stream order from largest to smallest. The HUC system is used for a variety of planning, scientific, and regulatory purposes. The project is located within the Upper Levisa sub-basin (4th order stream, 8-digit HUC 05070202). The Upper Levisa boundaries encompass approximately 1,200 square miles that include a portion of eastern Kentucky, a portion of Wise County, nearly all of Dickenson County, and most of Buchanan
County. The project is located primarily within the Home Creek-Levisa Fork subwatershed (6th order stream, 12-digit HUC 050702020201), with approximately 454 acres of the proposed land acquisition area (proposed right of way plus remnant acquisitions) lying within this subwatershed, as shown in Figure 5. Approximately one acre of the additional acquisition area is located in the Russell Prater Creek subwatershed (6th order stream, 12-digit HUC 50702020407).

Corridor Q Overlap Phase A would cross the streams listed below and shown in Figure 6:

- Belcher Branch
- Left Fork Bull Creek (Convict Hollow)
- Joe Branch
- Poplar Creek and two of its unnamed tributaries

Alternative F1 Modified would cross Belcher Branch and Joe Branch. Alternative F1 Modified also would cross Poplar Creek, but would do so on a bridge, which would not require direct encroachment into Poplar Creek. Therefore, Corridor Q Overlap Phase A would involve direct encroachments into four streams (Left Fork Bull Creek (Convict Hollow), Poplar Creek, and two tributaries of Poplar Creek) that would not be encroached upon by Alternative F1 Modified. There are no streams within the additional acquisition areas outside the proposed right of way for Corridor Q Overlap Phase A.

The 2016 waters of the United States (WOUS) jurisdictional delineation (3B Consulting, 2016) assigned each stream a flow regime classification of ephemeral, intermittent, or perennial based on field review for each identified stream. Presence of a defined bed and bank structure, ordinary high water mark, evidence of water flow, and ability to transport nutrients to downstream waters were used to delineate the flow regime and jurisdiction of each stream channel observed. All data collected during the site visits were reported on standard US Army Corps of Engineers (USACE) jurisdictional determination forms, which are included in the delineation report. The delineation report was submitted December 12, 2016 to USACE for review. A copy of the report also is included as an appendix to the Natural Resources Technical Memorandum (VDOT, 2017a).

Table 4 compares the lengths of delineated streams within the footprint of the Alternative F1 Modified corridor and the proposed right of way footprint of Corridor Q Overlap Phase A. In total, the Corridor Q Overlap Phase A right of way footprint would encompass more estimated stream length (approximately 1.53 miles) than the Alternative F1 Modified corridor (approximately 0.29 miles). However, this comparison does not account for the impacts of disposal sites needed to dispose of excess excavated material because information on such sites was not available when the Alternative F1 Modified corridor was defined. A more realistic comparison based on construction limits is provided in the discussion following Figure 6.

### Table 4. Potential Impacts to Streams (in miles)

<table>
<thead>
<tr>
<th>Stream Type</th>
<th>Alternative F1 Modified (within Corridor)</th>
<th>Corridor Q Overlap Phase A (Within Proposed Right of Way)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ephemeral</td>
<td>0.22</td>
<td>0.40</td>
</tr>
<tr>
<td>Intermittent</td>
<td>0</td>
<td>0.18</td>
</tr>
<tr>
<td>Perennial</td>
<td>0.07</td>
<td>0.95</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>0.29</strong></td>
<td><strong>1.53</strong></td>
</tr>
</tbody>
</table>

Note: Figures for Alternative F1 Modified do not account for impacts of disposal of excess excavated material since quantities and disposal sites were unknown at the time the Alternative F1 Modified corridor was defined. Table 5 provides a more realistic comparison based on estimated construction limits.
Reevaluation for Corridor Q Overlap – Phase A

Figure 5. Sub-watersheds
Figure 6. Waters of the US Jurisdictional Delineation
After FHWA approved the location of Alternative F1 Modified within the Corridor Q/Section IIIB Overlap and indicated that the project could proceed to subsequent development, VDOT and the DBT began design work. As part of that effort, the DBT developed estimated cut and fill limits and evaluated various options regarding the amount of earthwork required. The DBT determined that under the four-lane design originally proposed, Corridor Q Overlap Phase A would have required excavation of approximately 14.5 million cubic yards of rock and soil (Bizzack, 2017). Most of the excavated material would have had to be deposited in offsite disposal areas because, with a bridge proposed at the Poplar Creek crossing, there were not enough roadway fill sections to accommodate the material. Given that the two largest cost elements of roadway construction involve excavation and bridges, the DBT undertook analyses to eliminate the bridge over Poplar Creek and construct a roadway embankment at the same location using the excess excavated material. The DBT also looked at ways to reduce the amount of earthwork required, which resulted in the proposed reduction in typical cross section to accommodate a two-lane roadway with truck climbing lane. This change resulted in reduction in excavation to approximately 11.8 million cubic yards (Bizzack, 2017). These modifications (reduction of typical cross section and elimination of bridge at Poplar Creek) would substantially reduce construction costs while also achieving more of a balance of cut and fill earthwork and substantially reducing the need for offsite disposal of excess material. Although the proposed fill at the Poplar Creek crossing would impact Joe Branch, Poplar Creek, and two unnamed tributaries of Poplar Creek to an extent that Alternative F1 Modified would not, the box culvert and fill option would substantially reduce impacts to other streams by avoiding off-site disposal of excess material. Specifically, under the bridge scenario, the DBT estimated that disposal of excess excavation would need to occur at four separate sites entailing impacts to Knotty Poplar Fork and increased impacts at Left Fork Bull Creek (Convict Hollow), Joe Branch, and unnamed tributaries of Poplar Creek. Additional impact to Belcher Branch also would occur as a result of providing a connection at Route 614.³ No stream impacts are now proposed as part of offsite disposal of excess excavation. Table 5 compares impacts within roadway construction limits and excess material disposal sites under the two scenarios.

Table 5 – Summary of Estimated Stream and Wetland Impacts within Construction Limits

<table>
<thead>
<tr>
<th></th>
<th>Projected Permanent Stream Impacts (linear miles)</th>
<th>Projected Permanent Wetland Impacts (acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Roadway</td>
<td>Excess Material Disposal Areas</td>
</tr>
<tr>
<td>Phase A with Bridge at Poplar Creek, Disposal Areas Required</td>
<td>0.22</td>
<td>1.28</td>
</tr>
<tr>
<td>Phase A with Box Culvert and Fill at Poplar Creek, No Disposal Areas Required</td>
<td>1.03</td>
<td>0</td>
</tr>
</tbody>
</table>

In summary, the DBT’s analysis concluded that by consolidating the excavated material into a single, larger embankment at Poplar Creek, the overall stream impacts would be less than for a scenario that includes a bridge at Poplar Creek and disposal sites for excess excavated material. (See Bizzack, 2017 for additional details.)

Ponds. One pond with an area of approximately 0.23 acres lies within the Corridor Q Overlap Phase A proposed right of way adjacent to Poplar Creek. This is a new impact resulting from

³ The original configuration of the roadway called for a connection at Route 614 as a connection at Route 604 would not be practicable under the bridge scenario at Poplar Creek.
installation of the proposed box culvert and associated fill at Poplar Creek. Alternative F1 Modified included a proposed bridge crossing of Poplar Creek that would not impact this pond.

**Wetlands.** Executive Order 11990, Protection of Wetlands, requires that each federal agency take action to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance their natural values.

Wetlands are defined by the USACE (33 CFR 328.3[b]) and the US Environmental Protection Agency (USEPA) (40 CFR 230.3[t]) as:

> Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

As reported in the 2014 Environmental Studies document, the National Wetlands Inventory (NWI) database shows no wetlands within the project area. However, a WOUS jurisdictional delineation (3B, 2016) identified palustrine emergent (PEM) wetlands within the delineation area. Only one wetland site would be encroached upon by Corridor Q Overlap Phase A. The site is at the headwaters of Left Fork Bull Creek (Convict Hollow) and is within a former sediment basin that was associated with a mining operation. The total size of the site is approximately 0.22 acres and the dominant vegetation (approximately 60% cover) is cattails (*Typha latifolia*). Approximately 0.03 acres of the wetland are within Corridor Q Overlap Phase A proposed right of way limits at the toe of a fill slope. Alternative F1 Modified does not encroach upon this site.

### 4.2.2 Water Quality

Existing water quality in the vicinity of the project is reflected in the designations of certain waters as “impaired.” The Virginia Department of Environmental Quality (VDEQ) makes impairment designations based on ability to support designated uses of the waters by humans or aquatic life. Impaired waters do not support one or more uses, which include aquatic life use, fish consumption use, shellfishing use, recreation use (swimming, boating), public water supply, and wildlife use. VDEQ documents the designations in 305(b) and 303(b) reports (after sections of the federal Clean Water Act that require such reports) and submits the reports to the EPA and Congress. **Figure 7** shows the locations of impaired waters. The impaired waters that would receive drainage from Corridor Q Overlap Phase A are the same as those reported in the Environmental Studies document for Alternative F1 Modified, namely, Bull Creek and its tributaries, Poplar Creek, and Levisa Fork. Although the magnitude of direct physical encroachment on Poplar Creek from Corridor Q Overlap Phase A would be greater than for Alternative F1 Modified, the water quality impacts are expected to be similar.

Potential short-term impacts of the proposed project will be minimized with implementation of appropriate erosion and sediment control practices in accordance with the Virginia Erosion and Sediment Control Regulations, the Virginia Stormwater Management Law and regulations, and VDOT’s Road and Bridge Specifications. These specifications also prohibit contractors from discharging any contaminant that may affect water quality. In the event of accidental spills, the contractor is required to immediately notify all appropriate local, state, and federal agencies and to take immediate action to contain and remove the contaminant. Additionally, the requirements and special conditions of any required permits for work in and around surface waters would be
Reevaluation for
Corridor Q Overlap – Phase A

incorporated into construction contract documents, so that the contractor would be required to comply with such conditions.

Figure 7. Impaired Waters

Water quality effects could occur as a result of removal of forest land, increases in impervious surfaces, and consequent increases in pollutants washed from the road surface into receiving water bodies. Stormwater management measures, including detention basins, vegetative controls, and other measures, will be implemented in accordance with federal, state, and local regulations to minimize potential water quality impacts. These measures would reduce or detain discharge volumes and remove pollutants, thus avoiding substantial further degradation of impaired water bodies in the project vicinity.

4.2.3 Floodplains and Flooding

No 100-year floodplains designated by the Federal Emergency Management Agency (FEMA) are in the vicinity of the project. The nearest FEMA-designated floodplain is along Levisa Fork to the east of the project. Notwithstanding, analysis was conducted for the triple 84-inch by 84-inch box culvert proposed for the Poplar Creek crossing to determine the extent of potential upstream backwater in the event that one of the barrels of the box culvert were to become clogged. The results showed a backup of water for approximately 450 linear feet upstream of the box culvert. Beyond the 450-foot distance, the stream elevations would be the same as for the unblocked
scenario. Accordingly, the backwater area has been included in the right of way footprint for Corridor Q Overlap Phase A. (Bizzack, 2016e)

4.2.4 Wildlife and Habitat
The construction of Corridor Q Overlap Phase A would result in removal of wildlife habitat, including forest areas. Based on the US Geological Survey (USGS) National Land Cover Dataset (NLCD), approximately 229 acres of forest lie within the proposed right of way footprint of Corridor Q Overlap Phase A, an increase over the 159 acres estimated within the corresponding section Alternative F1 Modified’s 750-foot-wide corridor. Based on the construction limits of Corridor Q Overlap Phase A, the actual physical impacts to forest are estimated at approximately 124 acres (Bizzack, 2016f). Within the proposed right of way, locations for approximately 52 acres of potential reforestation have been identified to offset the loss of forest area. The DBT is obligated under its contract with VDOT to coordinate with the Virginia Department of Forestry regarding a suitable mitigation plan for forest impacts. Within the additional acquisition areas beyond the proposed right of way are additional forested areas totaling approximately 156 acres. These areas are not expected to be disturbed by the project activities. However, should it become necessary to dispose of excess excavated material offsite, such disposal activity could result in additional forest impacts. No specific information regarding the need for such disposal offsite is available at this time.

4.2.5 Federally Listed Threatened and Endangered Species
The USFWS is responsible for listing, protecting, and managing federally listed threatened and endangered species under the Endangered Species Act of 1973, as amended (ESA). The USFWS’s online Information for Planning and Conservation (IPaC) system was queried for an updated official species list in September 2016. One of the goals of the IPaC system is to streamline the environmental review process associated with Section 7 of the ESA. The 2016 official species list included the five species listed below.

- Indiana bat (*Myotis sodalis*); endangered
- Northern long-eared bat (*Myotis septentrionalis*); threatened
- Virginia big-eared bat (*Corynorhinus (=plecotus) townsendii virginianus*); endangered
- Gray bat (*Myotis grisescens*); endangered
- Big Sandy crayfish (*Cambarus callainus*); threatened

The first three bat species were considered in the 2014 Environmental Studies document (the northern long-eared bat was proposed for listing at that time, the final listing occurred April 2, 2015). Although the gray bat was added to the Federal List of Endangered and Threatened Wildlife in 1976, this species had not previously been identified by USFWS as being potentially present in Buchanan County. The Big Sandy crayfish (*Cambarus callainus*) was added to the Federal List of Endangered and Threatened Wildlife since completion of the Environmental Studies document (Big Sandy crayfish final listing April 7, 2016).

**Indiana Bat, Northern Long-Eared Bat, Virginia Big-Eared Bat, and Gray Bat**

Winter Habitat
Winter habitat for the Indiana bat, northern long-eared bat, and Virginia big-eared bat include any type of underground structures such as limestone caves, sandstone rockshelters, and abandoned

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4 The FEIS noted that USFWS listed the gray bat for Wise County in its scoping response. The February 10, 1998 USFWS letter is reproduced in Appendix A of the FEIS.
underground mines. For the Gray bat, the majority of the wintering population resides in caves. Since Corridor Q Overlap Phase A is not within a limestone area complex, well developed caves are not expected to be in the proposed project area. Therefore, the most likely potential winter habitat for the four species of listed bat would be in abandoned mine portals. All four bat species are known to use abandoned underground mines during the autumn and winter as hibernacula.

**Summer Habitat**

Since the northern long-eared bat roosts in live, damaged, dying, and dead trees of 3” diameter at breast height (dbh) or greater, and the Indiana bat roosts in trees of 5” dbh or greater, it is assumed that all forested areas within the project area provide potential summer roosting habitat. Suitable summer roosting habitat may also be present for the gray bat and Virginia big eared bat within mine portals in the project area. Suitable foraging habitat includes waterbodies, fields, treelines, and riparian areas, with suitable corridors connecting potential roosting habitat to the foraging areas.

**Big Sandy Crayfish** In Virginia, Big Sandy crayfish have been reported to occur in the Russell Fork and Levisa Fork drainages in Dickenson, Buchanan, and Wise Counties. The decline of the Big Sandy crayfish in Virginia is attributed to habitat degradation resulting from extensive mining, logging, and development. Chemical and physical changes associated with these activities have made many streams within their historical range unsuitable for the crayfish. In the Big Sandy River basin of Virginia, VDEQ reported that 25 streams, stream segments, or stream systems (approximately 295 miles of stream length) were impaired. The primary causes of these impairments were noted as coal mining (n=5), rural residential development (n=12), forestry (n=1), or unknown (n=7). (USFWS, 2015) Sedimentation and other pollutants attributable to these sources degrade waters within the range of Big Sandy crayfish and likely have contributed to the decline and reduced distribution and abundance of the species. (USFWS, 2016).

**Preliminary Species Conclusions** No formal bat surveys or detailed habitat assessments have been conducted at this time. However, open mine portals are present in the project area that may provide suitable winter habitat for all bat species and summer habitat for the Virginia big eared bat and gray bat. Additionally, forested communities are present that may contain suitable summer roosting habitat for the Indiana and northern long-eared bat. Detailed presence/absence bat surveys will be conducted prior to any construction activities. The surveys would be conducted during the approved survey window (May 15 – August 15) and would be valid for 3 years. Adhering to time of year restrictions for forest clearing or other activities that may affect summer roosting habitat for the four bat species may be used as a means to mitigate any potential effect. Formal consultation with USFWS under Section 7 of the ESA may be required to determine the effect on summer roosting habitat or impacts to winter habitat.

No formal Big Sandy crayfish surveys or detailed habitat assessments have been conducted at this time. If suitable habitat is present, it is likely limited to the largest affected stream, Poplar Creek. If present, impacts to Big Sandy crayfish could occur as a result of in-stream construction, potential contaminants in runoff from the road, and erosion and sedimentation occurring as a result of alterations to the watershed. A detailed presence/absence survey will be conducted prior to construction. If the species is present, relocation efforts would be performed in accordance with VDGIF Big Sandy crayfish protocols prior to construction activities.
Based on available data, a preliminary determination of “may affect” is indicated for all five listed species. Further consultation with USFWS will be undertaken when species surveys are conducted and final species conclusions will be made at that time.

4.2.6 Farmland
Corridor Q Overlap Phase A would not change impacts to farmland, as defined in the federal Farmland Protection Policy Act (FPPA). Updated coordination with the Natural Resources Conservation Service (NRCS) and completion of the NRCS-CPA-106 Form (Farmland Conversion Impact Rating for Corridor Type Projects) has confirmed that there is no farmland within the proposed right of way footprint or the additional acquisition area of Corridor Q Overlap Phase A. Previous NRCS review also noted no impacts to farmland by Alternative F1 Modified. Therefore, no farmland would be converted and no further consideration is required for farmland protection measures or other alternatives that might reduce farmland conversion (7 CFR § 658.4(c)(2)). Buchanan County has established no agricultural or forestal districts under the Local Agricultural and Forestal Districts Act (§ 15.2-44 Code of Virginia), according to a Virginia Department of Forestry GIS database. Therefore, there continues to be no impact to agricultural or forestal districts.

4.2.7 Topography, Geology, and Coal Mines
The footprint of the land areas encompassed by the proposed right of way and the additional property acquisition area for Corridor Q Overlap Phase A is larger than the footprint for the 750-foot-wide Alternative F1 Modified corridor previously evaluated. However, the general topography and geology of land crossed by Corridor Q Overlap Phase A remain the same. The topography is characterized by intricately dissected (dendritic) drainage patterns where level surfaces are rare. Level land in the region is found in the alluvial valley floors and along major mountain ridges. Most ridge tops and alluvial valleys are very narrow, providing only slivers of level to moderately level land.

Geologic features consist of sedimentary rocks (sandstone, siltstone, shale, conglomerates, and coal), and there are two geological considerations for implementation of roadway projects in these conditions. The first relates to the engineering properties of coal that make coal unsuitable for road foundations. The second is the potential for acidic stormwater runoff from rock exposed to air and water as a result of excavation during construction. Both of these considerations are described further below.

Coal Encountered During Roadway Project Construction Because of the terrain, outcrops of coal seams occur at the ground surface throughout the study area. Excavation for roadway construction in this region often intersects coal seams. Accordingly, removal of coal deposits within the Corridor Q Overlap Phase A roadway template during construction is expected. The removal of coal for public road construction is referred to as incidental coal removal. Incidental coal removal for highway projects is performed under a government financed exemption (GFE) from the Surface Mining Control and Reclamation Act of 1977 (SMCRA). Incidental coal removal from a highway project right of way under a GFE does not constitute a mine as stated in DMME’s Guidelines for Coal Removal Associated with Government Financed Construction.

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5 The Virginia Department of Mines, Minerals and Energy (DMME) issues mine permits and performs inspections, investigations, and other health and safety related activities at coal mines within the Commonwealth of Virginia. DMME is also authorized to enforce and administer the Surface Mining Control and Reclamation Act of 1977 (SMCRA) (30 USC § 1201 et seq) and the Virginia Coal Surface Mining Control and Reclamation Act of 1979 (Chapter 19, § 45.1-226 et seq. of Title 45.1 of the Code of Virginia), which mirrors the federal law.
August 2010: “The area in which coal is excavated under an exemption to the permitting requirements of § 45.1-234 shall not be a mine.” Designation as a GFE is not allowed if the site is, in fact, a mine. The incidental coal is a byproduct of, not the purpose of, the road construction. Rather than dispose of this valuable resource in a waste dump, the coal can be sold if justified by the quality and quantity. The differences between footprints of Corridor Q Overlap Phase A and the corresponding section of the Alternative F1 Modified corridor may result in incremental differences in the quantities of incidental coal recovery during construction. Further, removal of coal by the mining operation within a portion of Corridor Q Overlap Phase A, as discussed in section 4.1.1 above, would reduce the amount of incidental coal to be removed during roadway construction.

**Acidic Stormwater Runoff** Exposure of sulfidic minerals to air and water may occur as a result of project construction, which could increase the acidity of stormwater runoff. The acidic runoff can corrode road infrastructure, degrade water quality, and affect aquatic plants and animals. In research that included compilation of a statewide sulfide hazard rating map, Orndorff and Daniels (2002) reported that the Appalachian Plateau region of Virginia poses a relatively low sulfide hazard risk. This is because some of the geologic formations in the region are generally low in sulfur content and others contain carbonate agents that offset the relatively minor amounts of sulfides found in most geologic sections. Although coal seams may contain accumulations of sulfides, these seams are relatively thin and are usually completely removed and marketed during road construction.

**Surface Coal Mine and effect on Road Design** For decades, coal mining has formed the foundation of the regional economy, and the locations of current, proposed, and legacy mining permits in the vicinity of Corridor Q Overlap Phase A are shown in Figure 8. At the time of the completion of the Environmental Studies document, there were no active or permitted mines within the Corridor Q Overlap Phase A corridor and there were no pending mining applications. On September 10, 2015, however, a coal surface mining operation (CSMO) permit was issued to the Black Diamond Company, a subsidiary of United Coal Company. CSMO #1102133, also known as Surface Mine No. 1, encompasses approximately 224 acres, approximately 34 acres of which lie within the proposed right of way of Corridor Q Overlap Phase A, as shown in Figure 8. Another approximately 30 acres of the mine are within the additional acquisition area.

The following information is summarized from *Technical Memorandum: Assessment of Impacts on the Project from Surface Mine No. 1 Active Mine, DMLR Permit No. 1102133* (Bizzack 2016b). Surface Mine No. 1 is currently active and coal removal is ongoing in accordance with the mining permit. The activities associated with the current approved permit include plans to actively mine coal from 2016 through 2017. The overburden and interburden materials removed as part of the surface mining will be replaced within the mine limits to the approximate original contours (AOC).

Excess material generated as a result of the swell of the excavated materials will be placed in designated disposal sites within the permit boundary. The mining and reclamation activities have implications for the design and construction of the Corridor Q Overlap Phase A roadway. Options are being considered for adjustments to cut slopes to ensure stability and to maintain positive drainage; construction of transition zones to account for material changes from existing rock to reclaimed mine spoil slope; removal and replacement of some or all of the mine fill; dynamic compaction of the mine fill; blending of the mine fill with materials excavated from roadway cuts; or other means to be identified during the final design phase of Corridor Q Overlap Phase A.
Figure 8. Coal Mines
Options to avoid Surface Mine No. 1 altogether have been considered by adjusting the location of the planned roadway project. However, the location of the Corridor Q Overlap Phase A terminus to the west at the completed Section IIIA Hawks Nest project and the future connection with existing US 460 at Grundy (at the terminus of Phase B of the Corridor Q Overlap project) provided little room for adjustment near the area of the planned surface mining activities. The planned roadway construction generally follows a ridgetop route, which largely avoids impacts to residences and aquatic resources outside of the planned embankment at Poplar Creek and Route 604. Alternative routes considered to the south to avoid Surface Mine No. 1 would require substantial additional embankment construction in both Woods Fork (Route 614) and Joe Branch, which would result in additional impacts to both residences and streams.

**Underground Abandoned Mine Void** An abandoned underground mine, referred to as KAP Mining Inc. No. 1 Mine, intersects the estimated excavation limits for Corridor Q Overlap Phase A. This mine was not identified in the Environmental Studies document because it was not known at the time. The KAP No. 1 Mine is an abandoned deep mine with some voids measured to be over 10 feet high. Test borings have shown accumulated water within some of the mine voids. According to the Technical Memorandum: Remediation of Planned Cut Slope Station 292+00 – 300+00 Due to Abandoned Mine Voids and Drainage (Bizzack, 2016g), the surface mining discussed above for Surface Mine No. 1 will remove a portion of the mine void and will drain water trapped within the abandoned mine works. Water accumulating within the mine works in the future will likely seep through mine spoil placed within the surface mining limits during the reclamation phase of the surface mining. By excavating coal from within the boundary of the underground mine it is unlikely that substantial amounts of water will remain in the abandoned works following surface mining and no substantial problems relative to the underground mine and construction of Corridor Q Overlap Phase A are expected.

### 4.3 Air and Noise

#### 4.3.1 Air Quality

Corridor Q Overlap Phase A is located in an area that is in attainment of all National Ambient Air Quality Standards (NAAQS) established by USEPA. As such, regional air quality conformity requirements do not apply. The results of the previous air quality modeling for the FEIS showed that no violations of NAAQS were expected. The 2014 Environmental Studies document concluded that, since the study area and expected use of the facility have not substantially changed, and since the updated traffic volumes were well below the threshold for consideration of quantitative analyses of carbon monoxide per the VDOT-FHWA Project-Level CO Air Quality Studies Agreement in place at that time, the project was not expected to interfere with the attainment or maintenance of the NAAQS.

With respect to mobile source air toxics (MSATs), the Environmental Studies document concluded that, based on FHWA guidance, the Section IIIB project, including the Corridor Q overlap portion, had low potential for MSAT effects because the forecasted daily traffic for the project would be well below the thresholds (i.e., 140,000 to 150,000 ADT) where the potential for MSAT effects increase or MSAT effects from a project become a concern. The Environmental Studies document further indicated that total MSAT emissions are virtually certain to be lower than present levels in the design year as a result of USEPA’s national control programs that are projected to reduce annual MSAT emissions by 83 percent from 2010 to 2050.
Based on a review of previous air quality study results and current regulations, conditions, and traffic data, a new or revised quantitative air quality analysis is not warranted as changes in the models, methods and/or assumptions from the original analysis are not considered substantive. That is, an updated quantitative analysis would not reasonably be expected to affect the modeling results and/or the analysis to the degree that it would change a finding, determination, or conclusion that all applicable requirements for air quality analysis for the project would be met.

The Environmental Studies document and the FEIS did not address greenhouse gases (GHG). The President’s Council on Environmental Quality (CEQ, 2016) only recently issued final guidance on considering GHG\(^{6}\) emissions and climate change in NEPA reviews. CEQ’s guidance counsels federal agencies to apply NEPA principles and the rule of reason inherent in NEPA and the CEQ’s NEPA regulations when assessing potential impacts of project-related GHG emissions on climate change in EAs and EISs.

Atmospheric concentrations of GHG have accumulated rapidly as the world has industrialized and emissions have increased. Scientists blame the accumulation of GHG in the atmosphere for global climate changes that adversely affect human health and welfare (USEPA, 2009). Electric power generation plants account for the largest share of total GHG emissions—approximately 31 percent—while transportation accounts for the second largest share—approximately 26 percent (USEPA, 2016a). The federal government’s regulatory approach to addressing climate change attributable to human-sourced GHG is to implement emissions reductions at the sources. For example, USEPA has issued fuel economy and emissions standards for automobiles and trucks (USEPA, 2012 and 2016b). Accordingly, there are no regulatory thresholds for atmospheric concentrations or emissions quantities of GHG that can be considered at a project level.

GHG emissions from vehicles using roadways are a function of traffic volume, distance travelled (expressed as vehicle miles travelled, or VMT), vehicle speed, and road grade. A detailed VMT analysis was not conducted. Rather, existing and forecasted traffic volumes are used as an indicator of the potential magnitude of GHG emissions from vehicles using Corridor Q Overlap Phase A and adjoining local roads. Existing traffic volumes and year 2040 traffic forecasts are 250 vehicles per day (vpd) or less on Routes 614 and 615. On Route 604 in the vicinity of the Corridor Q Overlap Phase A crossing, the existing traffic volume is approximately 560 vpd and the forecasted 2040 volume is approximately 630 vpd, an increase of about 13 percent. On Route 604 to the north approaching existing US 460, the existing volume is approximately 920 vpd and the 2040 forecast is 1,150 vpd, an increase of approximately 25 percent. The year 2040 forecasted volume for Corridor Q Overlap Phase A is approximately 14,970 vehicles per day. The low magnitudes of these volumes suggest that GHG emissions along existing roads and the proposed new road would not be substantial and therefore would have no meaningful contribution to climate change.

Greenhouse gas emissions also are generated during roadway construction and maintenance activities. Preparation of the roadway corridor (e.g., earth-moving activities) would involve consumption of energy and resulting GHG emissions. Typically, construction emissions associated with a new roadway account for approximately five percent of the total 20-year lifetime emissions from the roadway, although this can vary widely with the extent of construction activity.

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\(^{6}\) CEQ defines GHG as carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, nitrogen trifluoride, and sulfur hexafluoride.
and the number of vehicles that use the roadway (FHWA, 2016). Manufacture of the materials and fuel used in construction also would contribute to GHG emissions at the manufacturing sites. Maintenance activities on the new roadway also would incrementally increase energy consumption and GHG emissions in the future. However, Corridor Q Overlap Phase A is only 2.8 miles long, which is approximately 0.5 percent of the total of approximately 531 miles of roadway in Buchanan County.

A major factor in mitigating the increase in VMT nationally is USEPA’s GHG emissions standards, implemented in concert with national fuel economy standards (USEPA, 2012 and 2016). USEIA (2016) projects that vehicle energy efficiency on a per-mile basis will improve by approximately 23% between 2016 and 2040. This improvement in energy efficiency and corresponding reductions in GHG emissions rates would offset potential incremental increases in VMT in the project area. Thus, the project area would be expected to see a net reduction in vehicular GHG emissions under either the build alternative or the no-build alternative.

Based on the above, Corridor Q Overlap Phase A is not reasonably expected to have a substantial effect on the magnitude of GHG emissions and associated effects on climate change. Likewise climate change is not reasonably expected to substantially affect Corridor Q Overlap Phase A and its environmental effects. The project is not in a coastal area that would be subject to flooding from sea level rises, nor is the project located in floodplains that might be subject to increases in flooding due to more severe rainfalls that might arise from climate change.

### 4.3.2 Noise

A new detailed quantitative noise analysis was not conducted for purposes of this Reevaluation. Rather, a review of previous noise studies was conducted, along with a comparison of forecasted traffic volumes and qualitative conclusions regarding the likelihood of meaningfully different noise impacts for the current project area compared to previous analyses.

In the 2014 Environmental Studies document, traffic forecasts were updated to design year 2035 from the 2020 design year forecast prepared for the FEIS. The average daily traffic volume on the Corridor Q Overlap section from Route 614 to US 460 was forecast to increase approximately 17 percent, from 12,500 vehicles per day (vpd) in 2020 to 14,600 vpd in 2035. The FEIS analysis predicted noise levels well below the noise abatement criteria (NAC) and no receptors located within Corridor Q Overlap section were identified as being affected. While forecasted traffic volumes increased due to extension of the design year farther into the future, the increases were found to be not substantial enough to meaningfully change the noise analysis results from the FEIS. Alternative F1 Modified also shifted locations of portions of the corridor, so the distance to receptors that could be potentially affected shifted as well from what was assumed in the FEIS. Given the locations of the shift in alignment, the conclusions of the FEIS regarding noise impacts were assumed to be transferrable to the new receptors.

The year 2040 traffic forecast for Corridor Q Overlap Phase A between Route 614 and Route 604 is approximately 14,970 vpd, which is only slightly higher than the 2035 daily forecast of 14,600 vpd generated for this segment in the 2014 Environmental Studies document. Accordingly, it is concluded that there would be no material change in noise impacts, i.e., noise levels at receptors along the project would be below the NAC.
4.4 Parks and Recreational Resources
Corridor Q Overlap Phase A would not change impacts to parks and recreational resources because there are no such resources within or adjacent to the project. A review of the project area and the Virginia Department of Conservation and Recreation online database indicates that there are no parks or recreation areas, nature conservancy conservation lands, or Virginia Outdoors Foundation protected easements within or adjacent to the Corridor Q Overlap Phase A footprint. Likewise, none of these resources are within or adjacent to Alternative F1 Modified.

4.5 Historic Properties
Corridor Q Overlap Phase A would not impact historic properties because there are no historic properties present within the area of potential effects (APE). The 2016 Cultural Resources Survey Poplar Creek Project Phase A Buchanan County, Virginia (S&ME, 2016) documents the review of previous historic property identification efforts in the APE and findings from the 2016 survey in the APE to identify unrecorded resources. The survey will be coordinated with the Virginia Department of Historic Properties (VDHR), the State Historic Preservation Office for Virginia, for concurrence that none of the cultural resources recorded in the APE are eligible for the National Register of Historic Places and that Corridor Q Overlap Phase A would have no effect on historic properties. VDHR previously concurred on February 28, 2011 that Alternative F1 Modified would have no effect on historic properties.

4.6 Hazardous Materials
Corridor Q Overlap Phase A would not impact any known hazardous material sites because no such sites have been identified within or adjacent to the project. The federal government and the Commonwealth of Virginia, primarily through the US Environmental Protection Agency (EPA) and the Virginia Department of Environmental Quality (VDEQ), respectively, regulate hazardous materials under multiple statutes. These agencies maintain databases of sites and facilities regulated by the statutes. The databases were reviewed to identify and locate sites with the potential presence of any hazardous materials or wastes within a one-mile-wide corridor centered on the Corridor Q Overlap Phase A centerline. No hazardous material sites were identified.

4.7 Indirect Effects
Indirect effects are those that are caused by an action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on natural systems, including ecosystems (40 CFR § 1508.8(a)). The analysis of indirect effects for Corridor Q Overlap Phase A followed a seven-step process described in the Transportation Research Board’s (TRB) National Cooperative Highway Research Program (NCHRP) Report 466, Desk reference for estimating the indirect effects of proposed transportation projects (TRB, 2002) and outlined below:

Step 1 – Scoping.
Step 2 – Identify study area’s direction and goals.
Step 3 – Inventory study area’s notable features.
Step 4 – Identify impact-causing activities of proposed action and alternatives.
Step 5 – Identify indirect effects for analysis.
Step 6 – Analyze indirect effects and evaluate analysis results.
Step 7 – Assess consequences and develop mitigation.
A detailed discussion of the methodology and analysis of indirect effects using the seven-step process is presented in the *Indirect and Cumulative Effects Technical Memorandum* (VDOT, 2017b).

### 4.7.1 Methods for Indirect Effects Analysis

According to NCHRP Report 466, indirect effects can occur in three broad categories:

- **Encroachment–alteration effects** (effects stemming from direct encroachments or alterations of the physical environment). These are changes in the behavior and functioning of the affected environment that occur later in time or some distance away from the initial direct physical impact (e.g., a change in flow regime of a stream caused by installation of a culvert may over time cause changes to habitat characteristics downstream). These types of effects sometimes are addressed along with direct effects, although direct effects are construed by regulation to occur at the same time and place as the action (40 CFR 1508.8(a)).

- **Induced growth** impacts. Development (land use changes) that occurs as a result of changes in traffic access and mobility.

- **Impacts related to induced growth.** These are the effects of the project-influenced development (impacts on the human and natural environment attributable to the change of land use induced by the project).

Accordingly, indirect effects study areas were developed for the following resource topics beginning with the proposed location of Corridor Q Overlap Phase A as shown in Figure 1 and moving outward to a logical regional boundary within which indirect effects may be experienced:

**Socioeconomics and Land Use:** The study area for the indirect effects analysis for socioeconomics and land use includes the Census Block Groups abutting the project or abutting connecting roadways where induced development could potentially occur. Corridor Q Overlap Phase A would have controlled access, preventing direct access to properties abutting the road right of way. Access to Corridor Q Overlap Phase A would be provided only at Route 604. The most likely and predictable locations for induced growth effects would therefore include lands within a one-mile radius of the Route 604 intersection and along roads leading out from the intersection to a five-mile distance. These areas, which represent the induced growth study area for the Corridor Q Overlap Phase A, are shown in Figure 9. This area of potential induced growth includes areas within and around the Town of Grundy, which was identified as the primary location for growth and development in the indirect and cumulative impacts analysis for Alternative F1 Modified in the Environmental Studies document.

**Natural Resources:** This study area was established to analyze indirect and cumulative effects to Waters of the US, water quality, wildlife, and threatened and endangered species. The natural resources study area is comprised of the Home Creek – Levisa Fork HUC 12 subwatershed, shown in Figure 7.

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7 Induced growth is development that would not otherwise occur if the project were not constructed. Guidance in the North Carolina Department of Transportation’s (NCDOT) *Guidance for assessing indirect and cumulative impacts of transportation projects in North Carolina*, vol. II: practitioners handbook (NCDOT, 2001) suggests the identification of a specific distance from an interchange or intersecting road where induced growth may occur. Based on the guidance, areas within a radius of one mile around the interchanges/intersections and a distance of five miles along the roads leading to the interchanges/intersections were considered as the most likely areas to experience induced growth.
Figure 9. Areas of Potential Induced Growth
Taking into consideration the impact-causing activities and the potential direct effects summarized in Sections 4.1 through 4.6 of this Reevaluation, along with the induced growth potential of the project, the following two subsections describe the analysis of indirect effects, followed by a summary of the overall consequences and mitigation.

4.7.2 Effects Related to Induced Growth

Employment Opportunities If induced growth materializes, local residents would benefit from increased employment opportunities. Such opportunities may include construction jobs and, depending on the types of businesses established, service, manufacturing, education, research, and other types of jobs.

Business Opportunities A variety of business types could be attracted to induced development areas. They may be travel or recreation-related service business (hotels, restaurants, tour businesses), manufacturing or warehousing related, or consumer related (shopping centers), or other types.

Stream and Wetland Displacements Construction of developments potentially induced by the project could displace or relocate streams or wetlands. However, impacts to these resources are restricted and regulated by USACE and any impacts will require the developer to implement appropriate mitigation.

Threatened or Endangered Species Construction of developments potentially induced by the project could destroy or modify habitat for federally listed species. More specifically, such development could involve forested areas that may serve as habitat for federally listed threatened or endangered bat species.

Wildlife Habitat Construction of developments potentially induced by the project could displace various types of habitat, including forest, barren land, or streams and wetlands.

4.7.3 Encroachment-Alteration Effects

Socioeconomic Effects Alteration of travel patterns and accessibility may, over time, result in changes to community composition, cohesion, and stability. Communities can become more attractive, or unattractive, depending on perceived benefits or detriments of living in proximity to the new road. Such changes may take years before they are manifested or recognized. Changes in travel patterns may also result in perceived improvements to quality of life due to improved access to jobs, goods, and services.

Ecological Effects Habitat fragmentation and degradation may bring about potential changes in wildlife population density and species richness. These changes may only be realized over a period of years or decades. Changes in stream hydrology or configuration by the initial project construction could result over time in ecological changes downstream as biota adjust to modified flow regimes or changes in sediment inputs. Loss of headwater streams could result in changes in nutrient and detritus inputs to larger downstream waters. Such changes could potentially affect food availability and resident biota populations. Excavation and earthwork during construction could result in exposure of acid- and/or total dissolved solids (TDS)-bearing soils and rocks, the runoff from which could affect downstream water chemistry. Changes in water chemistry could also affect resident biota. Sedimentation from excavation and earthwork during construction should be minimal due to the commitment to ensure strict erosion and sediment controls during construction.
4.7.4 Assessment of Consequences and Mitigation
Even though improvements to access and mobility in and of themselves do not guarantee that development will occur, induced development is assumed to occur. Indeed, such development would fulfill a key element of the purpose and need for the project. Although some of the resulting impacts of such development may be perceived as negative (e.g., impacts to streams, wetlands, and wildlife habitat), other impacts would be perceived as very beneficial (economic opportunities, improved travel time and safety, and better quality of life). Many of the direct impacts that may translate into encroachment-alteration indirect effects can be mitigated to some extent. For example, stream displacements would be offset by stream mitigation required by federal and state permitting regulations. Temporary and permanent stormwater management measures would be implemented to minimize downstream contamination by construction and highway runoff.

4.8 Cumulative Impacts
Cumulative effects (40 CFR 1508.7) result from the incremental impacts of an action when added to other past, present, and reasonably foreseeable future actions that affect the same resources. To alleviate confusion regarding the nature of cumulative impacts, the Council on Environmental Quality issued guidance on consideration of past actions (CEQ, 2005). According to the guidance, environmental analysis required under NEPA is forward-looking in that it focuses on the potential impacts of the proposed action that an agency is considering. Accordingly, a cumulative effects analysis is not merely a cataloging of the environmental impacts of past actions. Rather, the analysis considers “the identifiable present effects of past actions to the extent that they are relevant and useful in analyzing whether the reasonably foreseeable effects of the agency proposal for action and its alternatives may have a continuing, additive, and significant relationship to those effects.” The aggregate environmental effects of past actions in the study area are reflected in the current state of the affected environment.

For the cumulative impacts analysis, there are similarities to the indirect effects analysis with respect to much of the data collection and boundary setting, but there are also differences in describing and accounting for the impacts. Accordingly, as with several other recent projects, VDOT and FHWA have agreed to follow the five-element framework described in the Fritiofson v. Alexander (1985) case, and outlined in FHWA’s 2003 interim guidance (FHWA, 2003), as the best approach for the cumulative impacts analysis. The steps are listed below:

Step 1 – What is the Affected Geographic Area?
Step 2 – What are the Resources Affected by the Project?
Step 3 – What are the Other Past, Present, and Reasonably Foreseeable Actions That Have Impacted or May Impact the Same Resources?
Step 4 – What are the Impacts of Other Past, Present, and Reasonably Foreseeable Actions?
Step 5 – What is the Overall Impact on Affected Resources from the Accumulation of the Actions?

A detailed discussion of the methodology and analysis of cumulative effects using the five-step process is presented in the Indirect and Cumulative Effects Technical Memorandum (VDOT, 2017b).

4.8.1 Methods for Cumulative Impacts Analysis
The geographic area affected by the project (the study area) is the same as the study area for the indirect effects analysis described in Section 4.7.1 above, and the resources affected by the project are those identified in Sections 4.1 through 4.6 of this Reevaluation. The time frame for this cumulative effects assessment begins in the 1950s, with the advent of large-scale surface mining
in the region, and ends at the year 2040, the design year for the project. Although coal mining in the region certainly began long before the 1950s and accelerated with railroad construction in the early 20th century, the large-scale surface mining is what generates particular concerns by the public and regulatory agencies in terms of its environmental impacts.

4.8.2 Past, Present, and Reasonably Foreseeable Actions
Past, present, and reasonably foreseeable actions considered in the analysis were identified by reviewing past documentation and records of public and agency input from past project review efforts. Past, present, and reasonably foreseeable actions considered in the analysis are listed in Table 6.

Table 6. Past, Present, and Reasonably Foreseeable Actions

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Project Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coal mines</td>
<td>Resource extraction</td>
<td>Surface coal mines throughout the study area, ongoing</td>
</tr>
<tr>
<td>Coal mine reclamation</td>
<td>Restoration / mitigation</td>
<td>Reclamation of current mined lands and pre-1977 Surface Mining Control and Reclamation Act (SMCRA) abandoned mine lands, ongoing</td>
</tr>
<tr>
<td>Gas wells and distribution lines</td>
<td>Resource extraction</td>
<td>Gas wells throughout study area, pipelines to collection points</td>
</tr>
<tr>
<td>Spearhead Trails</td>
<td>Recreation</td>
<td>System of off-highway-vehicle (OHV) trails throughout the seven-county region of southwest Virginia; some proposed portions of trails would be in vicinity of study area</td>
</tr>
<tr>
<td>Southern Gap Business Park</td>
<td>Commercial/Industrial</td>
<td>3,000-acre business park, including 1,100 acres of developable land, located on reclaimed mine land south of Corridor Q Overlap Phase A</td>
</tr>
<tr>
<td>US 121 Section IIIA (Hawks Nest)</td>
<td>Transportation</td>
<td>Construction to rough grade complete - Planning for finished grade, NEPA complete</td>
</tr>
<tr>
<td>US 121 Section IIIIB (east of Route 604)</td>
<td>Transportation</td>
<td>Portion of Section IIIIB of proposed US 121 between Route 604 and Route 643</td>
</tr>
</tbody>
</table>

4.8.3 Overall Impact on Affected Resources from the Accumulation of the Actions
The overall accumulated impacts from the project combined with the actions described in the preceding section are summarized below:

- Social
  - While the residential displacement impacts of the multiple portions of Corridor Q/US 121 would be additive, these impacts would not all be occurring simultaneously due to the phasing of construction over a period of years. Additionally, the implementation of a comprehensive relocation program would minimize the effects on residents required to move.
  - The neighborhood and travel pattern alteration impacts also would be disbursed over time and space, which should allow ample opportunity for residents to adapt to the changes.
  - Corridor Q Overlap Phase A and the other nearby proposed road projects would provide cumulative benefits for residents of the study area and beyond such as higher travel speeds,
lower travel times, and greater mobility and accessibility to business and personal services and amenities.

- Cumulative social impacts associated with Corridor Q Overlap Phase A would be similar to those that were anticipated in the Environmental Studies document.

- **Cemeteries**
  - The expected cumulative effect is limited to the direct impact of Corridor Q Overlap Phase A. This is a new impact that was not associated with Alternative F1 Modified. The cemetery displacement is a result of the design concept change at the Poplar Creek Crossing from a bridge to a box culvert and fill.

- **Economic**
  - Improved transportation would support economic development and tourism in the region which is consistent with local and regional goals.
  - Cumulative economic effects associated with Corridor Q Overlap Phase A would be similar to those that were anticipated for Alternative F1 Modified in the Environmental Studies document.

- **Habitat and Wildlife**
  - While a wildlife habitat would be converted to highways and other uses, the majority of this habitat consists of forest lands that are abundant throughout the region.
  - Cumulative impacts to wildlife habitat associated with Corridor Q Overlap Phase A would be similar to those anticipated for Alternative F1 Modified in the Section IIIB Environmental Studies document.

- **Streams**
  - While the impacts of the multiple sections of Corridor Q/US 121, as well as the multiple mining operations in the study area, on streams would be additive, these impacts would not all be occurring simultaneously due to the phasing of highway construction and mining activities over a period of years. Like Corridor Q Overlap Phase A, the direct impact at each stream would be localized and the reach of the indirect impacts is not expected to be extensive.
  - Stormwater generated through new impervious surfaces would be treated through improved or new stormwater management facilities. Implementation of stream mitigation, both for the highway projects and mining activities would offset the adverse direct and indirect impacts. Present and future mines are subject to reclamation requirements of SMCRA, and pre-SMCRA abandoned mine lands may be reclaimed under Virginia’s AML Program.
  - Cumulative impacts to streams associated with Corridor Q Overlap Phase A would be similar to those anticipated for Alternative F1 Modified in the Environmental Studies document.

- **Wetlands**
  - While the impacts of the multiple sections of Corridor Q/US 121, as well as the multiple mining operations in the study area, on wetlands would be additive, these impacts would not all be occurring simultaneously due to the phasing of highway construction and mining activities over a period of years. Implementation of wetland mitigation, both for the
highway projects and mining activities, would offset the adverse direct and indirect impacts to wetlands.
- The direct impact to wetlands by Corridor Q Overlap Phase A is very small and the cumulative impacts to wetlands associated with Corridor Q Overlap Phase A would be similar to those anticipated for Alternative F1 Modified in the Environmental Studies document.

- Ecological Process
  - Cumulative effects from habitat fragmentation are expected to be limited because large blocks of habitat will likely continue to persist due to topographic constraints on future development.
  - The adverse cumulative effects from the loss of headwater streams and exposure of acid-and/or TDS-bearing soils and rocks are reflected in the designation of some streams in the study area as impaired for benthic biota.
  - Cumulative impacts to ecological processes associated with Corridor Q Overlap Phase A would be similar to those anticipated for Alternative F1 Modified in the Environmental Studies document.

- Water Quality
  - Cumulative water quality impacts from past, present, and reasonably foreseeable future projects are anticipated given the existing impaired status of waters within the study area. Since the establishment of the Clean Water Act in 1972, discharges of pollutants are more highly regulated than prior to that year. State and federal certifications required for discharges to waters of the United States have greatly reduced the potential for substantial harm to water quality by pollutants that may be contained in such discharges.
  - Stringent stormwater management requirements are imposed on any new construction project to minimize adverse water quality impacts. Therefore, the contribution of Corridor Q Overlap Phase A to cumulative water quality impacts is expected to be minimal.
  - Cumulative impacts to water quality associated with Corridor Q Overlap Phase A would be similar to those anticipated for Alternative F1 Modified in the Environmental Studies document.

- Threatened and Endangered Species
  - While the impacts of the multiple sections of Corridor Q/US 121 on listed species may be additive, these impacts would not all be occurring simultaneously due to the phasing of construction over a period of years. Additionally, potential harm to these species may be minimized through the implementation of time-of-year restrictions and strict erosion and sediment control measures.
  - Cumulative impacts to threatened and endangered species associated with Corridor Q Overlap Phase A would be similar to those anticipated for Alternative F1 Modified in the Environmental Studies document.

5. MITIGATION MEASURES
The following mitigation measures have been proposed to compensate for unavoidable impacts associated with the project. All mitigation efforts will be coordinated with appropriate local, regional, state, and federal authorities.
5.1 Relocations
Right of way acquired for the roadway would be purchased in accordance with requirements of the federal Uniform Relocation Assistance and Real Property Acquisition Policies Act. Relocation assistance will be available to all residential displacees without discrimination. In addition, all displaced families and individuals would be relocated to suitable replacement housing; all replacement housing would be fair housing available to all persons without regard to race, color, religion, sex, or national origin; and all replacement housing would be within the financial means of the displacees. Each person would be given sufficient time to negotiate for and obtain possession of replacement housing. For the cemetery that would be displaced, all graves will be relocated to a suitable site in accordance with all applicable provisions of state law.

5.2 Waters of the US
Unavoidable impacts to waters of the US, including wetlands, will be offset by compensatory mitigation. Mitigation will be developed in coordination with USACE, VDEQ, and VMRC during the permitting process consistent with EPA’s and the USACE’s 2008 Final Rule, Compensatory Mitigation for Losses of Aquatic Resources (73 FR 19594 [April 10, 2008]). Potential water quality impacts will be minimized by implanting appropriate temporary and permanent erosion and sediment control practices in accordance with the Virginia Erosion and Sediment Control Regulations, the Virginia Stormwater Management Law and regulations, and VDOT’s Road and Bridge Specifications.

5.3 Forest
Of the approximately 229 acres of forest within the proposed right of way limits of Corridor Q Overlap Phase A, approximately 124 acres lie within the estimated construction limits and would be directly impacted. Within the construction limits, potential areas of reforestation have been identified. Areas that potentially could be planted and allowed to grow under unmanaged forest conditions include roadway embankment slopes, cut slopes 2:1 (horizontal:vertical) or flatter, and areas where temporary features such as sediment basins or staging areas are removed following completion of roadway construction. Three areas within the proposed right of way were identified totaling approximately 52 acres. Additional details on the potential areas of reforestation are included in the technical memorandum Assessment of Deforestation Impacts from the Project (Bizzack, 2016f). Additionally, the DBT is obligated under its contract with VDOT to coordinate with the Virginia Department of Forestry regarding a suitable mitigation plan for forest impacts.

5.4 Threatened and Endangered Species
Potential effects on federally listed threatened or endangered species will be minimized by conducting species surveys within suitable habitat at a time closer to anticipated start of construction to confirm the presence or absence of listed species. Coordination will continue with USFWS for final determinations of effects. If listed bat species are present, time of year restrictions for tree clearing will be imposed. If Big Sandy crayfish is present, time of year restrictions for in-stream work will be imposed and efforts will be made to relocate potentially affected populations in coordination with USFWS and the Virginia Department of Game and Inland Fisheries.
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3B Consulting Services, LLC (3B)

Council on Environmental Quality (CEQ)

Federal Highway Administration (FHWA)
2016b Appalachian Highway Development (ADHS) Corridor Q – Poplar Creek Phase A Variance Requests. Letter dated February 24, 2016 from Tim Lewis, FHWA, to Amanda J. Cox, VDOT, approving VDOT’s variance requests.

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Fritiofson
1985 Fritiofson v. Alexander, 772 F.2d 1225 (5th Cir. 1985).
North Carolina Department of Transportation (NCDOT)


Orndorff and Daniels


S&ME


Transportation Research Board (TRB)


US Energy Information Administration (USEIA)


US Environmental Protection Agency (USEPA)


US Fish and Wildlife Service (USFWS)


US Geological Survey

2016 National Map Website:  http://viewer.nationalmap.gov/basic/?howTo=true

Virginia Department of Mines, Minerals, and Energy (DMME)


Virginia Department of Transportation (VDOT)


2015 VDOT GIS layers compiled from data from the following agencies:

2009 Agricultural and Forestal Districts. Virginia Department of Forestry. Layer name: SDE_VDOT_AG_FREST_DIST.

2003a Cold water streams survey. VDGIF. Layer name: SDE_VDGIF_TROUT_STREAMS.

2003b Reaches that are confirmed or potential migration pathways, spawning grounds, or nursery areas for anadromous fish. Virginia Department of Game and Inland Fisheries (VDGIF). http://www.dgif.virginia.gov/gis/gis-data.asp. Layer name: SDE_DGIF_ANADROMOUS.
2009  Threatened and endangered species observations. VDGIF. Layer name: SDE_DGIF_TE_WATER_SEG.


2015d  VDH, Office of Water Programs, Division of Water Supply Engineering, and as altered for presentation by the GIS Program Office of the Virginia Department of Transportation. http://www.vdh.state.va.us/ODW/. Layer name: SDE_VDH_SRFC_WTR_INTK.

2015e  VDH, Office of Water Programs, Division of Water Supply Engineering, and as altered for presentation by the GIS Program Office of the Virginia Department of Transportation. http://www.vdh.state.va.us/ODW/. Layer name: SDE_VDH_SRFC_WTR_INTK_WTRSHD.


2015g  Environmental Protection Agency, Hazardous Materials. Layer Name: SDE_US_EPA_RCRA.

2016  VDGIF Threatened and Endangered Species – Bald Eagle Nests. Layer name: SDE_VDGIF_TE_SPEC_EAGLES.

2016a  Traffic Technical Memorandum, Corridor Q Overlap Phase A. State Project No.: 0121-013-793, P102, R201, C501, D601; UPC 90282; From: Route 614 To: Route 604; Buchanan County. December 28, 2016.

2016b  Variance Requests to the Federal Highway Administration (FHWA) for Concurrence Appalachian Development Highway System (ADHS), 2012 Estimate of the Cost to Complete. Letter dated February 22, 2016 from Amanda J. Cox, VDOT, to Tim Lewis, FHWA.

2016c  Design Exception Request for Route 604. US Route 121/460 Poplar Creek Phase A Section, Buchanan County. Project No. 0121-013-793, PE-101, PE-102, RW-201, C-501;
UPC 90282. Form LD-440 with supporting documentation and attachments. Approved by FHWA April 14, 2016.


2016e *Socioeconomics, Land Use, and Right of Way and Relocations Technical Memorandum, Corridor Q Overlap Phase A*. State Project No.: 0121-013-793, P102, R201, C501, D601; UPC 90282; From: Route 614 To: Route 604; Buchanan County. December 28, 2016.

2017a *Natural Resources Technical Memorandum, Corridor Q Overlap Phase A*. State Project No.: 0121-013-793, P102, R201, C501, D601; UPC 90282; From: Route 614 To: Route 604; Buchanan County. January 19, 2017.