United States Department of Agriculture
Forest Service
George Washington and Jefferson National Forests
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File Code: 2720; 1900
Date: July 30, 2015

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First St., N.E., Room 1A
Washington, DC 20426

Dear Ms. Bose:

The Forest Service appreciates the opportunity to review the draft resource reports filed by Atlantic Coast Pipeline, LLC for the proposed Atlantic Coast Pipeline Project (Docket No. PF15-6-000). The proposed project would affect National Forest System (NFS) lands on the George Washington National Forest and the Monongahela National Forest.

The Forest Service has reviewed the draft resource reports and identified information and data requirements necessary for the assessment of project effects on NFS lands. The requirements are detailed in the attached document, along with comments and discussions of concerns of potential project effects on NFS lands.

For questions, please contact Jennifer Adams, Special Project Coordinator, at (540) 265-5114 or by email at jenniferpadams@fs.fed.us.

Sincerely,

H. THOMAS SPEAKS, JR.
Forest Supervisor

Comments of the U.S. Forest Service
Atlantic Coast Pipeline Project No. PF15-6-000
Draft Resource Reports

1. The draft resource reports do not reflect many of the Forest Service's scoping comments on the Atlantic Coast Pipeline Project (ACP Project or project) and statements made during meetings with Atlantic Coast Pipeline, LLC (ACP).

2. The "Appalachian Trail" should be referred to by its official and formal name, Appalachian National Scenic Trail.

3. The Forest Service is concerned about ACP's proposal to conduct soils and geology studies post-filing rather than pre-filing. The Forest Service provided extensive comments regarding study needs for soils and geology in the scoping comments and those comments are reiterated in this document. The Forest Service requires the studies to be completed in order to identify and analyze potential effects of the proposed projects on NFS lands. Additionally, the results of the soils and geology studies could influence the need for route variations. Please note that ACP would need to contact the Forest Service for permission to do geologic surveys because ACP did not request permission to conduct geology studies under the current permit (at least on the GWNF).

4. Regarding studies, provide a schedule of studies and surveys showing the studies that have been completed to date and dates of completion, and the studies remaining to be conducted with expected dates of completion.

5. In draft resource report 1, clarify whether any storage locations are proposed on National Forest System (NFS) lands where hazardous materials would be stored including but not limited to blasting materials, drilling fluids, contaminated soil, and fuels and oils.

6. Clarify whether any equipment cleaning would be conducted at areas other than staging areas, particularly on NFS lands. If equipment cleaning is proposed on NFS lands, identify the specific locations, describe the procedures, and list proposed measures to prevent effects on resources.

7. The purpose and need described in section 1.1.1 should be expanded to include a discussion of the necessity to cross NFS lands. Forest Service Manual 2700, Special Uses Management (FSM 2700), §2703.2 describes Forest Service policy relating to the use of NFS lands. §2703.2(2) states to authorize use of NFS lands only if: a) the proposed use is consistent with the mission of the Forest Service to manage NFS lands and resources in a manner that will best meet the present and future needs of the American people; b) the proposed use cannot reasonably be accommodated non-NFS lands. §2703.2(3) further states not to authorize the use of NFS lands solely because it affords the applicant a lower cost or less restrictive location when compared to non-NFS lands. Therefore, ACP's discussion should clearly articulate why the project cannot reasonably be accommodated off NFS lands. This discussion should not cite lower costs or less restrictive locations as the sole purpose of crossing NFS lands.

8. According to section 1.4.1.1, land within the temporary construction right-of-way will be restored to preconstruction conditions and uses following construction of the proposed project. Please define the term "preconstruction conditions and uses" and provide pictorial examples of a post-construction pipeline right-of-way that has been restored to preconstruction conditions and uses, particularly as it relates to steep and forested terrain.

9. According to section 1.5.1.2, timber removal will be conducted in accordance with the Timber Removal Plan, which will identify the schedule and methods for timber removal and salvage from the construction right-of-way. Revise the final resource reports, and include language in the Timber Removal Plan, to acknowledge that timber located on NFS lands will be paid for and disposed of at the discretion of the Forest officer in charge.

10. Section 1.5.1.8 should contain a statement that all restoration activities located on NFS lands shall be completed to Forest Plan Standards and accepted federal, state, and local best management practices, to the satisfaction of the Forest Service representative in charge. In addition, as-built drawings of the segments crossing NFS lands will be provided to the Forest Service and all National Forest boundaries disturbed or damaged within the project area will be re-established upon completion of installing the pipe and establishing the right-of-way corridor.

11. According to section 1.5.2.1, page 1-43, flume pipes will be inspected prior to installation to confirm pipes are free of dirt, grease, oil, and other pollutants. Please explain the process and criteria for confirming pipes are free of dirt, grease, oil, and other pollutants.

12. In section 1.1.1.6, beginning on page 1-39, please state whether any proposed locations for the discharge of water used for hydrostatic testing are proposed on NFS lands. For any locations proposed on NFS lands, identify the locations on a map and include a written description of the areas along with a discussion of potential effects to abiotic and biotic resources.

13. In section 1.6, identify how long spreads on NFS lands would be disturbed by construction and restoration activities.

14. Any plans identified in Appendix 1F and proposed for implementation on NFS lands must be approved by the Forest Service. Please note requirements for plans proposed for implementation on NFS lands may exceed the requirements of plans required by the Federal Energy Regulatory Commission (FERC) or permits granted by state agencies. ACP should submit plans in writing to the Forest Service for review and comment to ensure compliance with the Land Resource Management Plan (LRMP or Forest Plan) for both the Monongahela National Forest (MNF) and the George Washington National Forest (GWNF). Preliminary comments on plans are provided in discussions herein.

15. When addressing item #32 in FERC's comments on the draft resource reports concerning cumulative effects of the proposed project, identified in Appendix 1L, include discussions of the following resources on NFS lands:

a. social characteristics of the forests;
b. wildlife species that may be cumulatively affected by long linear rights-of-way;
c. wildlife species that may be cumulatively benefited by long linear rights-of-way; and
d. viewsheds.

16. In appendix 1L, identify and quantify effects of proposed pipeline crossings on the Appalachian National Scenic Trail, a Congressionally designated National Scenic Trail under the National Trails System Act of October 2, 1968. Include all currently proposed pipeline crossings of the Appalachian National Scenic Trail along its 2180 miles, and crossings by other rights-of-way.

17. In sections 1.1.1 and 1.1.2, locations by milepost are not provided for all facilities. To facilitate the review of the proposal, please revise the final resource reports to show mileposts of facilities or reference the table in which locations are identified.

18. 1.3.1.1, page 1-13. This is the first reference in the overall proposal to the Appalachian Trail. The formal name is the Appalachian National Scenic Trail.

19. In section 1.3.1.1, regarding the statement that the proposed pipeline facilities are collocated to the maximum extent possible, provide a list of the existing corridors and explain why collocation with those corridors is not possible.

20. Regarding impacts to scenery, relating to sections 1.4.1.1, 1.5.1.2 and 1.5.2.4, and Table 1.5.1-1, there is a concern that the pipeline alignment will run up and down slopes as opposed to laterally on side slopes. There is also a concern that more extensive grading will be required in steep side slope or vertical areas and trench width needs to be up to twice as wide in steep terrain. In steep terrain impacts to scenery are the greatest. Draft resource reports 1 and 8 describe why this alignment and trench width is preferable for pipeline construction (2 years), but it is not clear why this alignment is preferable for operations (many decades).

21. The proposed plans listed in section 1.5 do not include a plan for Scenery, which will be required on NFS lands.

22. Figure 1.5.1-1 is very helpful. Similarly, a figure showing the sequence of construction for roads and other above ground facilities on NFS lands would be helpful.

23. Section 1.5.1.2 contains no reference to the Forest Service's general requirement for lopping and scattering of cleared vegetation and stumps, even if chipped. Final resource reports should address this requirement in either reports 1, 8, or 10. Specify maximum extents of chip piles, tree tops, etc.

24. In section 1.5.1.3, identify if blasting is proposed near Braley Pond Recreation Area and dam, in the vicinity of milepost 111.

25. In section 1.5.2.1, horizontal directional drill is discussed beginning on page 1-46, but only in the context of Waterbody crossings. In drat resource report 8, horizontal directional drill is mentioned as a possible construction technique for the crossing of the Appalachian National Scenic Trail and the National Park Service-Blue Ridge Parkway. Provide information sufficient to understand the difference between horizontal directional drill and conventional bore, including the limitations of the techniques.

26. According to section 1.5.2.3, unpaved roads, two-tracks, trails, and driveways will be crossed using the open-cut technique. According to draft resource report 8, this method will render the road or trail impassable for the period of construction. Impassable roads and trails do not meet the needs of hunters, hikers, horse and mountain bike riders, and other dispersed recreationists who utilize the network of Forest System trails and roads proposed to be crossed by this project, including both Forest Service roads open to public motor vehicle use and also those closed either seasonally or permanently to public motor vehicle use but used by the public on foot, horse, or bike; and by the agency and its partners. The final resource reports should address effects of construction on users of Forest System trails and roads.

27. Table 1.6-1 lists expected construction on spreads and identifies construction on the GWNF lands from January 2017 thru October 2018. For spreads on NFS lands, develop a construction schedule that minimizes the duration of construction on NFS lands and adjusts the timing of the construction to reduce overall disruption caused by construction to dispersed recreationists, including hunters during big game hunting seasons. If the construction schedule cannot be revised, provide specific reasons.

28. Table 1.12-1 shows that the only permit(s), approval(s), and consultation(s) needed for the portion of the proposal that is on GWNF lands including the Appalachian National Scenic Trail is a BLM special use permit and some amendments to the Forest Plan. This table should include consultation with either the National Park Service-Appalachian Trail Park Office or the Appalachian Trail Conservancy.

29. Revise section 1.13 to note that, in addition to the LRMP, other documents may be relevant, such as agency manuals and handbooks.

30. Section 1.14 does not specify if the Appalachian Trail Conservancy (nationally and regionally) and potentially impacted ATC-affiliated Local Appalachian National Scenic Trail Clubs such as the Old Dominion Appalachian Trail Club.

31. According to sections 1.4.1.1 and 8.2.1, construction corridors would be narrowed from the 125-foot construction corridor to a 75-foot construction corridor in wetlands. Explain why narrow construction corridors are not possible in all ecologically sensitive areas on NFS lands. If narrow construction corridors are possible in any ecologically sensitive areas on NFS lands, those areas should be identified and mapped in the final resource reports. The Forest Service made this request in its scoping comments.

32. On page 1-39, it is stated that suitable fill, including crushed limestone rock, may be used to protect the pipeline in rocky areas. When working in acidic ecosystems on NFS lands, alkaline materials are prohibited to avoid leaching of alkaline soil water or subsurface flow into acidic wetlands or bogs. Also, please define suitable fill and unsuitable fill.

33. According to page 1-39, coal ash and coal refuse will not be used to backfill the trench. Because the MNF2 route traverses areas on Cheat Mountain where coal mining refuse was once disposed, explain how and where refuse from this area would be disposed.

34. Page 1-40 discusses stabilization practices, but does not address the length of right-of-way that will be disturbed at one time. The amount of right-of-way on NFS lands that is cleared at any one time should be limited to reduce erosion and runoff concerns. Limit the amount of open trench and soil disturbance to minimize the risk for erosion, sedimentation, and loss of stockpiled bare soil. Specifically, any variances to state or federal permit requirements requested by ACP and proposed for implementation on NFS lands must be reviewed and approved by the USFS.

35. On page 1-52 in the discussion about the use of erosion blankets on steep slopes, clarify whether geotextile nails will be used with the erosion blankets.

36. Appendix 1H, part 2, contains notes from a September 24, 2014 meeting between the Forest Service and ACP. The second paragraph of these notes incorrectly depicts of a portion of the meeting. To correct the record, the Forest Service provides a correct depiction of the conversation in the paragraph below.

> *Karriker followed this discussion by indicating that the MNF staff had reviewed Dominion's route, and if there were no alternative to crossing Cheat Mountain, the route was probably the "least bad" route available. Within the constraints of the area where Dominion prefers to cross the MNF, they had done a good job of using the resource-specific shape file data that the MNF provided to avoid sensitive areas to the extent possible. However, he followed this by reviewing with Dominion specific notes from his resource staff about the route, which he also provided to Dominion as hard copy typed notes. The notes and discussion indicated that substantial resource impact issues remain to be addressed, including potential impacts to threatened, endangered, and sensitive species; conflicts with ongoing ecosystem restoration activities; potential inconsistencies with the Forest Plan; and many other issues. MNF staff indicated that they would like to see other alternatives analyzed. Karriker indicated that MNF staff were ready to review Dominion's Special Use Permit application for survey permission within the MNF.*

37. On pages 2-5 and 2-6, it is difficult to correlate the aquifer map with the table (Figure 2.1.1-1 and table 2.1.1-1). For example, between mileposts 82.9 and 147.3, the Valley and Ridge aquifers appear to be grouped in the table but differentiated on the map. Please clarify.

38. In section 2.1, identify any hazardous or toxic chemicals or materials that would be transported to and used in the pipeline corridor on NFS lands.

39. On page 2-6, Table 2.1.1-1, for locations without aquifer information and classified as "other rocks" (e.g. between milepost 52.1 and 59.7 and between 68.5 and 80.2), explain a potential for aquifer impacts will be determined in those areas and clarify if the "other rocks" designation indicates that no aquifer occurs beneath this area.

40. The discussion on pages 2-9 to 2-11 is limited to the locations of wells; the discussion does not state how the applicant plans to address wells and wellhead protection areas. The final resource reports should address wells and wellhead protection areas.

41. On page 2.15, explain how the direct connection is determined, referring to the statement "... karst features with direct connection to phreatic zone ..."

42. Table 2.2.2-3 indicates that the proposed route crosses no intermittent or ephemeral waterbodies on MNF which seems unlikely. Identify the source of the information and update the table based on results of field surveys to reflect accurate numbers of stream types for both the GWNF and MNF.

43. The information on page 2-22 regarding Tier 1/2/3 streams is incomplete. According to the report, the proposed route crosses five Tier 3 streams in West Virginia. Other streams proposed for crossing on the MNF meet the definition of Tier 3 streams in WV, generally because they contain reproducing trout populations. Such streams are in fact Tier 3 streams, even if not depicted on the West Virginia Department of Environmental Protection maps. Identify and map all such streams on NFS lands and provide a discussion of project effects on streams in the final resource reports, highlighting the Tier 3 streams and other sensitive waters in section 2.2.10.

44. In sections 2.2.6 and 2.2.7, and other relevant sections, discuss the effects of water withdrawals for and use for construction activities including but not limited to dust abatement, hydrostatic testing, and hydroseeding, on aquatic resources on NFS lands.

45. On page 2-29, it is stated that additional temporary workspace would be located at least 50 feet from stream banks, with the exception of site-specific modifications requested by ACP. The MNF Forest Plan prohibits landings and skid roads within 100 feet of streams (perennial, intermediate, or ephemeral). Likewise, the GWNF Plan requires ground disturbing activities to be outside the Riparian corridor (100 feet minimum). Revise the final resource reports to locate Additional Temporary Work Space (ATWS) farther away from streams consistent with the MNF and GW Forest Plans.

46. On page 2-30, the definition of "temporary bridge" includes clean rock over culverts, railcar flatbeds, or "other types of spans." Some of these are not actually bridges. Please coordinate with the Forest Service to gain approval of crossing structures on NFS lands.

47. In section 2.2.10, clarify if equipment will be cleaned prior to being on-site and in-stream.

48. In section 2.2.10, describe concrete coating activities. The report states that concrete coating activities would occur at minimum of 100 feet from wetlands/waterbodies. Please state if these activities can be performed off-site, and if so, explain why the activities are proposed on-site on NFS lands.

49. Provide to the Forest Service a stream crossing monitoring plan to be implemented during operation of the pipeline. The plan should include the rationale for scheduling the timing of stream monitoring, monitoring locations, and the specific criteria ACP would use to determine whether stream stability and bank conditions are being maintained, as well as remediation actions what would occur should crossing not meet the criteria. The plan should include documentation of ACP's consultation with the appropriate agencies in developing the plan. The plan should be included in the final resource reports.

50. Regarding section 2.2.11, where permanent access roads cross perennial streams on NFS lands, natural stream simulation design for aquatic organism passage must be used. Stream crossing structures shall be designed to withstand a stream discharge that represents the 100-year return interval; refer to the Forest Plan (e.g. MNF Forest Plan standards SW36, SW44, SW45, SW46, RF07 and guidelines SW25, SW51, SW60, SW62, WF19, WF21). Submit the proposed designs of stream crossing structures to the Forest Service for approval. Include the approved designs in the final resource reports.

51. In section 2.2.11, discuss increased sedimentation from cleared slopes leading down to streams or new access/maintenance roads.

52. In section 2.3.6.4, it is stated that wetlands will be protected from sedimentation from adjacent upland construction by installing temporary erosion control devices at the edges of upland construction areas. Any long-term increase in sedimentation to the wetland as a result of the adjacent permanently cleared upland areas should also be addressed.

53. Regarding Table 2A-1, time restriction for streams on the MNF, note that perennial streams on the MNF that support coldwater fisheries resources have additional restrictions on potential sediment producing activity within channel buffers (MNF Forest Plan direction SW37, WF14).

54. Regarding Old House Run in Table 2A-1, Fishery Type and Time Restriction, Warmwater classification is incorrect and the N/A time restriction is not appropriate (MNF Forest Plan direction WF14).

55. In Appendix 2C, Table, 2c-1, all brook trout streams crossed by the pipeline in Virginia should be included in this table (as identified in Table 2A). Several of the streams in Table 2C are brook trout streams, in addition to potential for mussels, specifically but not limited to the crossings on Stoutameyer Branch, Jennings Branch, White Oak Draft, Ramseys Draft, Hodges Draft, Back Creek, Orebank Creek.

56. For West Virginia streams in Table 2C, Shavers Fork through UNT of Little River, terms used to identify sensitive fish features associated with waterbodies crossed by the projects appear to be applied in an inconsistent manner. For example, some stream entries list Tier 3 and brook trout as sensitive fish features while others only list either brook trout or Tier 3; by definition, streams supporting reproducing brook trout populations on the MNF are classified as Tier 3 streams (West Virginia Department of Environmental Protection 2008). The following 6th level watersheds (12 digit Hydrologic Unit Code) and the streams within them represent the watershed restoration priorities on the MNF in accordance with the USDA Forest Service Watershed Condition Framework: West Fork Greenbrier River, Little River (in the West Fork Greenbrier River), and the Headwaters East Fork Greenbrier River. This status carries an elevated awareness of risks and potential affects to the aquatic ecosystem to which they belong.

57. In section 3.1.1, identify all streams, waterbodies, wetlands, floodplains and other riparian areas crossed or potentially affected by the proposed pipeline the associated biota.

58. The fishes listed for Virginia in Table 3.1.2-1 do not adequately represent the fish species which may occur in waterbodies crossed by the proposed project, since the table includes only game fish and excludes other species characteristic of those waters. Update the table.

59. Add the Greenbrier River to the river basins intersected by the projects on page 3-11.

60. The information presented on representative warmwater and coldwater fish species in West Virginia on page 3-9 is inaccurate. The Forest Service recommends reviewing Stauffer et al. (1995) to update this section.

61. This section references Appendix 2C in Resource Report 2, of which no wild trout streams are identified for Virginia, although there are wild trout streams being crossed as stated on page 3-11 and 3-18. The list of trout streams should be complete and updated; for example, Orebank Creek is missing from the list as a trout stream.

62. The proposed route crosses three 6th level hydrologic unit code watersheds that are included in the Federally Listed Fish and Mussel Conservation Plan as developed by the Forest Service and U.S. Fish and Wildlife Service in 2004. Address and reference the mussel conservation plan either in this section or in section 3.7. Discuss the effects of the proposed pipeline on these watersheds and its resources. Please consult the Forest Service for a copy of the plan.

63. The proposed route crosses three priority watersheds as identified in the GWNF Forest Plan. Discuss the effects of the proposed pipeline on these watersheds and its resources.

64. On page 3-15, include a discussion of the MNF Forest Plan direction relating to potential restrictions on activities in/around streams (MNF Forest Plan SW37, WF14).

65. On page 3-16, ACP proposes to cooperate with the West Virginia Division of Natural Resources (DNR) about brook trout. Most aquatic habitat and populations associated with native brook trout communities in West Virginia that could be affected by the proposed project activities occur on NFS lands managed and the MNF is the lead agency for funding and directing watershed and stream restoration in brook trout ecosystems in West Virginia. Therefore, please consult with the MNF about brook trout.

66. Table 3.1.3-1, includes streams that are not actually in Randolph County, West Virginia. The rare fish species identified in these streams have been documented in more streams in the list than the table indicates (ACP_FishDistribution_030415.xlsx emailed to D. Jones on 3/9/2015; Stauffer et al. 1995; Welsh and Cincotta 2007). Rare fish species have also been documented in other streams that would be intersected by the proposed project, but these other streams are not listed in the table. Please consult further with Dan Cincotta at West Virginia DNR and Dr. Stuart Welsh at the West Virginia University.

67. According to page 3-16, the nearest public fishing lake is located more than 2 miles from the proposed route. This statement is incorrect. Buffalo Lake on the MNF, which is open to public fishing, is located within 4,000 feet of the proposed corridor.

68. In section 3.1.3.2, on page 3-19, ACP states that Braley Pond is within 0.5 mile of the proposed mainline, but "neither lake nor angling activities will be impacted by the ACP" (page 3-19). Discuss the rationale for this statement and consider conducting an analysis to determine if lake and angling activities will be impacted.

69. ACP crosses stocked trout waters above, below, or parallel to the stocked stream reach. Project effects on these fisheries must be identified and discussed in the final resource reports.

70. On page 3-20, under USFS Sensitive Species on the GWNF, there are two sensitive fish species that occur on the GWNF within or near the project corridor, the roughhead shiner and orangefin madtom. In addition, discuss other Forest Service sensitive species, management indicator species species, and locally rare species within the survey corridor and downstream of the proposed project.

71. The Virgnia Chapter American Fisheries Society (AFS) outlined concerns and made recommendations in a February 23, 2015 letter. The recommendations made by the Virginia AFS, and underlying concerns leading to those recommendations, should be addressed prior to making a determination of effect.

72. Include a more thorough discussion on short and long-term impacts on stream and riparian habitat and biota associated with pipeline construction activities, including sedimentation, turbidity, water pollutants, dissolved oxygen, pH, and temperature. Aquatic biota should include all those identified in section 3.1.2 and 3.1.3, and 3.7.

73. According to page 3-26 and 3-27, pipeline operation is not expected to impact fisheries. This statement would seem to dismiss potential adverse effects associated with roads used to access/maintain the proposed project, legal and potential illegal activity within the cleared

pipeline right-of-way, and accidental spills/leaks/ruptures that could occur. Include an analysis of potential contamination to water (and any other resource) that could result from construction equipment (i.e., oils, fuels, and fluids) and materials used to construct the pipeline or associated facilities.

74. Include an analysis and monitoring plan of potential water contamination and in-stream effects resulting from long-term operation and maintenance of the proposed pipeline. Include effects on stormwater from alteration of water drainage patterns, especially on steep slopes.

75. Include a detailed description of the proposed stream crossings on National Forest and their associated impact to the stream and riparian resources. Develop a plan for monitoring stream crossings during operation of the pipeline. The plan should include the rationale for scheduling the timing of stream monitoring, monitoring locations, and the specific criteria ACP would use to determine whether stream stability and bank conditions are being maintained, as well as remediation actions what would occur should crossing not meet the criteria. The plan should include documentation of ACP's consultation with the appropriate agencies in developing the plan.

76. A mussel study plan should to be approved by Virginia Department of Game and Inland Fisheries and the U.S. Fish and Wildlife Service for federally listed mussel species, and reviewed by the Forest Service for implementation on NFS lands. Mussel relocation should not be considered a substitute for minimizing effects to streams on NFS lands.

77. In section 3.2.1, also include the commonly accepted ecological descriptions used by the Nature Conservancy, located on the NatureServe website, to provide continuity with vegetation descriptions used by the GWNF in the Forest Plan and other documents providing standards and guidelines.

78. Regarding vegetation resources in section 3.2.1, describe impacts on NFS lands in terms of ecosystem group and structural class, as described in the GWNF revised LRMP, pages 2-9 through 2-17. Describe impacts on MNF lands in terms of forest community and age class, as described in the MNF LRMP, pages III–6 and III-4.

79. Conduct an extensive vegetation survey that documents stand age and height, and species by 2" diameter class, for all areas potentially impacted by the proposed right-of-way and any temporary and permanent access roads. The Forest Service requires this information to assess project effects as described in the item above. The index should be measured as that information is useful in preliminary estimates of volume and value of any wood products. The Forest Service Common Stand Exam methodology should be used. Consult the Forest Service for more information.

80. In section 3.2.1, describe impacts in terms of more specific vegetation types. The classifications of Coniferous, Deciduous, and Mixed Forests currently utilized in the draft resource report are too broad to describe project effects adequately, in terms relating to Forest Plan objectives.

81. In section 3.2.1, disclose the acres of existing, potential, and future old growth as identified by the GWNF Forest Plan (page 2-26 and Appendix B) that would be impacted. Consider impacts relating to the size and connectivity of old growth patches. Existing old growth on the GWNF should be defined pursuant to the Guidance for Conserving and Restoring Old Growth Forest Communities on National Forests in the Southern Region (Region 8 Guidance).

82. Conduct vegetative surveys designed to address the four operational criteria that define old growth per the Region 8 Guidance. This will be necessary to address the impacts described in the item above. These surveys may coincide with the vegetation surveys described previously with the addition of coring of trees that represent the oldest age class of a given stand so that criteria 1 of the Region 8 Guidance is addressed.

83. In the discussion of ecoregions in section 3.2.1.1, on page 3-36, excludes red spruce. Red spruce is a critical, unique, and globally rare ecological community that only exists at this far south at higher elevations within this ecoregion. Red spruce and spruce-hardwood communities support several plants on the Regional Forester Sensitive Species list, including white alumroot, bog buckbean, beadle's mountain mint, Canada yew, and others. Therefore, this community should be discussed as a distinct characteristic of this ecoregion.

84. The sentence on page 3-36, "Other common vegetation includes Kate's mountain clover, yellow nailwort, and low false bindweed (LandScope America, 2014)," is incorrect due to inaccurate paraphrasing. LandScope America's website actually states, "Shale barrens, a unique combination of geology, soil, topography, and climate, support rare species such as Kate's-mountain clover (*Trifolium virginicum*), yellow nailwort (*Paronychia virginica*), and low false bindweed (*Calystegia spithamaea*)." Kate's mountain clover and yellow nailwort are Regional Forester's Sensitive Species in part due to their rarity, and are not appropriate examples of "common vegetation" for this ecoregion. Revise the phrasing to reflect accurate descriptions of vegetation on NFS lands.

85. The sentence on page 39, "Deciduous forests (mesic-wet and xeric-mesic) grow best in drier, acidic soils on ridges and mountains and in areas with cold winters and hot summers (WVDNR, 2014c)," is incorrect. The information on the website actually reads, "Much of our land supports deciduous forests of various sorts. These range from oak forests that grow on dry, acidic soils of upper slopes and ridges to extremely diverse 'mixed mesophytic' forests that grow on enriched soils of lower slopes and coves" (WV DNR, 2015). Deciduous forests include communities across the entire hydrologic spectrum, from wet riparian and floodplain forests to dry oak-pine forests and limestone barrens, and also include the entire spectrum of soil pH, from highly acidic oak forests on sandstone-derived soils to very rich northern hardwood cove forests on calcareous, limestone-based soils. Revise the resource reports to accurately describe these deciduous forests.

86. On page 3-39, it should be stated that northern hardwoods (red maple, sugar maple, beech, black cherry, yellow birch) characterize middle elevations of the CA ecoregion, and spruce ecosystems characterize high elevations.

87. Regarding the following text taken from page 3-39: "Deciduous savanna and glade communities are primarily found in the CA ecoregion where there are shallow soils at higher elevations. Typical species include white cedar, sugar maple, four-leafed milkweed, and pignut hickory." This is incorrect due to poor paraphrasing. The cited website actually states, "Dominant trees are primarily stunted red and chestnut oak, scrub oak, pignut hickory, and Virginia pine; on higher-pH substrates the common trees include red-cedar and white ash." White cedar (*Thuja occidentalis*), in contrast, grows in rich, moist environments such as swamps and adjacent to streams (Burns 1990), although it can also occur on limestone cliffs. Revise the text to reflect accurate descriptions.

88. Concerning the sentence on page 3-40, which states, "Open lands include disturbed lands, grasslands, shrub lands, beach and shore lands, and cliff, canyon, and talus lands." Though there are areas of talus, none of the ecoregions affected by the proposed project are characterized by canyons. Please delete "canyons."

89. The sentence on page 3-40, "Typical species in grassland and herbaceous areas include American holly, little bluestem, Japanese stiltgrass, and woodoats," is incorrect. American holly is a woody understory forest interior species often associated with oak, hickory, sweet gum, ash, and red maple. Also, Japanese stiltgrass is a non-native invasive species and thus would not be considered characteristic of any native plant community.

90. Revise section 3.2.1.2, to adequately describe the habitat that is crossed by the proposed pipeline. Include discussions of rare communities near the project area, particularly Special Biological Areas, National Natural Landmarks, Special Biological Areas, and Cave Conservation Areas identified in the GWNF and MNF Forest Plans that may be affected by the proposed project.

91. On page 3-52, in the paragraph on red spruce stands, include the fact that areas in high elevations containing less than 10 percent red spruce are highly suitable for red spruce ecosystem restoration. Additionally, areas with "medium" red spruce cover (10-50%) are highly suitable habitat for rare species associated with the red spruce ecosystem, such as the northern flying squirrel and the Cheat Mountain salamander.

92. Regarding the sentence on page 3-52, "The USFS has recently taken efforts to decompact soils, control non-native plant species, and plant native species associated with spruce-hardwood ecosystems (USFS 2015)." The literature cited section lacks a citation for this reference. This statement does not accurately portray the extensive, ongoing, successful restoration projects on the Mower tract, of which the Lambert is an integral part. Tens of thousands of genetically local trees, shrubs, and other plants have been planted and are surviving and dozens of vernal pools have been installed for wildlife. Because the restoration project has been so successful, more work is planned. Over a million dollars have been invested in this effort by the Forest Service and its partners (Climate Framework, 2014). The AP-1 mainline route would significantly affect this unique area.

93. Regarding the sentence on page 3-52, "The USFS (2015) reported that the planted tree saplings have been browsed by deer, and the area remains largely clear of vegetation," the

literature cited section lacks a citation for this reference. Also, it is incorrect that the area remains largely clear of vegetation. The entire area is heavily vegetated with young trees, shrubs, forbs, and grasses, many of which were planted as part of the ongoing successful restoration project. Please revise this information to include correct information about the vegetation. See Climate Framework (2014) for more information.

94. On page 3-52, ACP proposes to coordinate with the MNF regarding planned restoration activities in this area. According to NRG (2015), Monongahela National Forest Route Alternatives Assessment, ACP would restore these areas with additional red spruce plantings following construction for no net loss. Please describe how the methods for the proposed plantings. The description should include the following:

a. a map showing the proposed locations of restoration;
b. a written description of the proposed locations;
c. criteria for site selection;
d. method of site preparation;
e. the quantity, species, and geographic sources of the trees, shrubs, forbs, grasses, sedges, and rushes proposed for planting;
f. proposed monitoring plans in perpetuity for the life of the project; and
g. the criteria for success

95. In section 3.2.2, the sentence on page 3-54, "The most common invasive plant species in West Virginia are marijuana, plumeless thistle, curled thistle, musk thistle, autumn olive, opium poppy, kudzu, multiflora rose, and johnsongrass (USDA 2014b)" is neither an indication of how common these species are in West Virginia nor an indication that all plants on the list considered invasive species. For a list of the most significant invasive species in the state across all taxa, please refer to Appendix B of the West Virginia Invasive Species Strategic Plan (WV DNR 2015b). Please also refer to MNF's list of invasive plants (USFS 2015), and the Potomac Highlands Cooperative Weed and Pest Management Area (2015).

96. Please include the list of priority non-native invasive plant species for the GWNF. The Forest Service can provide this list upon request.

97. Regarding the sentence on page 3-57, "Direct temporary impacts will result from tree removal, clearing, and grading in construction areas prior to installation of the pipelines" please describe plans to restore areas of temporary impact to pre-existing conditions, including restoration of species composition, community structure, and ecosystem functionality.

98. In section 3.2.3.1, please describe plans for how permanently impacted areas will be maintained in herbaceous cover type, including all chemical, mechanical, and other methods anticipated for removing woody vegetation.

99. On page 3-57, ACP indicates that vegetation communities in upland areas outside of the permanent pipeline rights-of-way will be restored to preconstruction conditions and cover types. Describe plans to restore areas of temporary impact to pre-existing conditions, including restoration of species composition, community structure, and ecosystem functionality. Also,

indicate if plantings are proposed along the maintained easements, and if so, identify the species proposed or planting. This information should be included in the restoration plan.

100. According to page 3-57, ACP is investigating potential seed mixes and restoration and maintenance practices that could provide suitable habitat for pollinator species in the maintained permanent easements for the pipelines. The Forest Service supports this intention to provide pollinator habitat with appropriate plantings. In the final resource report, provide the seed mix or species list proposed for use on NFS lands, and the geographic area from which seed and/or plant material will be sourced relative to where it will be planted. This information should also be included in the restoration plan.

101. In section 3.2.3, disclose the impacts to vegetation immediately adjacent to the temporary construction zone, access roads, and pipe storage and contractor yards due to root disturbance from excavation and root compaction resulting from heavy equipment operation. For instance, evaluate the likelihood of initiating oak decline or increasing wind throw as a result of these activities.

102. In section 3.2.3.3, in addition to native seed mixes to benefit pollinators, consideration should be given to providing shrub vegetation on the outer edges of the permanently maintained pipeline corridor, next to the naturally regenerating forest section post-construction. This would reduce the sharp edge effect of the pipeline corridor and provide escape cover for species like small mammals, reptiles, and amphibians needing to cross the permanently maintained corridor.

103. On page 3-60, it is noted that the Invasive Plant Species Management Plan will be provided in Appendix 1F of the final resource report. The final resource report should include a discussion of proposed measures for minimizing the introduction and spread of invasive species during construction, operation, and maintenance of the proposed pipeline. The discussion should address invasive plant species management in wetlands, riparian areas, and upland areas. The plan must include the following components, at minimum:

a. methods for identifying and treating invasive plant species before construction begins;
b. methods to prevent the introduction and spread of invasive plant species from construction equipment moving along the right-of-way and access points;
c. methods to contain invasive plant seeds and propagules by preventing segregated topsoil from being spread to adjacent areas or along the construction rights-of-way;
d. methods to address infestations of invasive plant species that develop during operation of the project (i.e., monitoring program in perpetuity for the life of the project); and
e. methods to prevent the introduction and spread of invasive plant species from introduced material.

Consult the Forest Service for requirements of any plan proposed for implementation on NFS lands. The Forest Service may have requirements in addition to the items listed above.

104. Maps identifying areas where invasive plant species occur and a written description of the areas of occurrence must be prepared prior to construction and updated at regular intervals. Descriptions of methods must include details of application methods and rates of applications of chemical and a schedule showing the frequency and timing of applications. A schedule for submitting regular reports to the Forest Service must be included in the plan. The final resource report should also address potential effects of control methods to terrestrial and aquatic wildlife, and how those effects will be minimized. The Forest Service may require changes or modifications to the plan.

105. On page 3-67, under Amphibians and Reptiles, hellbenders are described as a common species. This is incorrect. In both Virginia and West Virginia, hellbenders are on the state list of rare, threatened and endangered species. Please edit the document to reflect this.

106. An ecoregion-based description is too general to be applicable in section 3.3.1. This section should include discussions of state rare species as well as threatened, endangered, sensitive, and locally rare species lists provided by the Forests. Local data sources such as the West Virginia Breeding Bird Atlas, peer-reviewed literature, species accounts written by state wildlife agencies and the U.S. Fish and Wildlife Services should inform discussions. Revise the final resource report accordingly.

107. Statements in section 3.3.2 of the resource report indicate that impacts on wildlife along the proposed pipeline routes and associated work areas will generally be of short duration and limited to the period of construction. Statements also indicate that, with the exception of forested lands, the projects will not permanently alter habitat characteristics. This is incorrect. The report should address permanent loss of habitat, habitat alteration, and habitat fragmentation that will result from the proposed project that will particularly affect forest-dependent and habitat-specific species. Please expand the discussion to include impacts to sensitive forest-dependent species and habitat-specific species.

108. In section 3.3.2, discuss effects of construction equipment and construction activities including vibrations, noise, and human presence on wildlife.

109. Please describe how impacts to wildlife from erosion control materials will be minimized. Consider products that may be less harmful to wildlife (CCC NPS Program 2012).

110. In section 3.4, in addition to the highest priority bird species from BCR 28, high priority bird species should be addressed. Additionally, all management indicator species and locally rare bird species with habitat occurring along any proposed route alternative, and/or documented in route surveys, should be addressed in the final resource reports along. A discussion of potential effects of the proposed project on these species should also be included.

111. In section 3.5, please indicate that a significant golden eagle wintering population is known along mountain ridges of the GWNF. It is incorrect that golden eagles "occasionally use winter habitat in Appalachian Mountain ridges and valleys." New research on wintering golden eagles has documented consistent winter activity in Virginia, West Virginia, Pennsylvania, and North Carolina along mountain ridgelines throughout the fall, winter, and early spring months (Katzner et al. 2012; EGEWG 2015).

112. In section 3.5, include a discussion of potential project effects on both the bald and golden eagle.

113. In section 3.7, list the Forest Service as an agency from which information was requested.

114. On page 3-96, impacts to the groundwater hydrology, sinkhole ponds, and associated species near the Big Levels/Maple Flats Special Biological Area are a concern. Discuss the direct, indirect, and cumulative effects of federally listed species, including Virginia sneezeweed and swamp pink, which occur within 2 miles of the proposed route.

115. Correct the text on page 3-82 to state that Cheat Mountain salamanders can occur in high-elevation forests that do not have a spruce component and have been found below 2,980 feet. The section fails to indicate the proposed route crosses through known habitat of the Cheat Mountain salamander.

116. A cumulative effects analysis should be prepared for the Cheat Mountain salamander, salamander, at a minimum including the effects of roads, rights-of-way, habitat loss, habitat fragmentation, and population isolation.

117. On page 3-86, the monarch butterfly is noted as under review for federal listing. The Forest Service recommends analyzing project effects on the species in the event the species is proposed for listing.

118. On page 3-87, the report states that undocumented Indiana bat hibernacula and summer roosting and foraging habitat may exist along the pipeline route in West Virginia. Correct this section to show the Forest Service has documented roosting and foraging habitat within the vicinity of the proposed route.

119. On page 3-87, the report states, "During environmental field surveys for the Projects, Atlantic and DTI searched for potential hibernacula within a 300-foot-wide survey corridor centered on the proposed routes, and three potential hibernacula were identified. Atlantic and DTI will utilize a qualified bat surveyor to conduct field reviews of these potential portal features in the Spring of 2015." The Forest Service is unaware of any surveys having been conducted on NFS lands and has not been notified of potential hibernacula. Clarify if these searches and surveys were conducted on NFS lands and if so, consult with the Forest Service immediately.

120. On p 3-88, update the information for the northern long-eared bat to provide a correct description of habitat. Please conduct a thorough literature review to support descriptions of the

species and its habitat. When addressing item #86 in FERC's comments, consult with the Forest Service to identify concerns about fragmentation on NFS lands, and when addressing item #99 in FERC's comments regarding the interim 4d rule, consult with the Forest Service to identify management concerns with respect to the proposed project.

121. On page 3-91, discuss effects of the project on the James spinymussels and associated habitats downstream of proposed crossings in Highland County, Virginia.

122. On page 3-93, include the small whorled pogonia for Virginia and West Virginia. On page 3-95, Small Whorled Pogonia, please add that habitat requirements for the small whorled pogonia are poorly understood. Also, there are occurrences of this plant on dry ridgetops and in pine forests, as well as in dry and mesic oak forests.

123. On page 3-95, the sentence "There are less than 20 individuals left in the wild (FWS, 2014r)" is incorrect. The species profile for shale barren rock cress states, "the number of individuals per population is low, most with fewer then (sic) 20 individuals." The report states extant occurrences of shale barren rock cress have been reported on the GWNF in West Virginia and Virginia. Please add that occurrences also exist on the MNF and other federal lands in West Virginia. Also, the habitat description for shale barren rock cress should be shale barrens and shale woodlands.

124. On page 3-96, adjust the description to show Virginia spirea is known to occasionally occur along disturbed right-of-ways (Ogle 1992) and in disturbed wetlands with dynamic flood regimes. The Forest Service recommends surveying for this species along all waterbody and wetland crossings.

125. All federally listed and proposed species with habitat occurring along all proposed route alternatives, and those species documented in route surveys must be discussed in the section on federally listed species. The Forest Service provided this list previously, and if needed, can provide it again.

126. Section 3.7.2 should include all Forest Service sensitive and management indicator species, and locally rare species identified by the MNF and GWNF. The section should also include a discussion of suitable habitats within the vicinity of the proposed project.

127. On page 3-101, ACP describes a model developed for habitat of the northern flying squirrel, looking at a 400-meter buffer around known observation points, as representative of suitable habitat. Such a model is not valid. Observations are based solely on areas that have been trapped or where nest boxes have been installed, representing only a small portion of the available suitable habitat because many areas of suitable habitat have not been trapped nor have had nest boxes installed or checked. The Forest Service previously provided the applicant with mapped suitable habitat and the mapped habitat must be considered suitable unless otherwise proven by a field assessment conducted by a qualified biologist and approved by the Forest Service.

128. Update section 3.7.2.2 with Cow Knob salamander survey data showing the Cow Knob salamander occurs within the pipeline corridor. Virginia Department of Game and Inland Fisheries recommended that the route avoid Cow Knob salamander habitat and locations (J.D. Kleopfer, personal communication). Develop alternatives that avoid impacts to the salamander such as 1) completely avoiding Cow Knob salamander habitat and 2) using horizontal directional drill to reduce direct take and habitat loss.

129. The following text appears in the draft resource report: "The Cow Knob salamander is recognized as a management indicator species within the GWNF. In 1994, the FWS and the USFS entered into a Conservation Agreement for the cow knob salamander resulting in protection of occupied habitats within the GWNF." This text does not adequately describe the purpose of the conservation agreement. Replace the text with the text below to adequately describe the purpose of the agreement.

Nearly the entire known range of the Cow Knob salamander (*Plethodon punctatus*) occurs on the GWNF. This area is located on the North River Ranger District along the crest of Shenandoah Mountain and Great North Mountain, largely above 3,000 feet elevation. Cow Knob salamanders typically reach their highest population densities in older age hardwood forests with abundant large down wood and rock. The U.S. Fish and Wildlife Service and the GWNF were the first federal agencies in the Nation to enter into a Conservation Agreement in 1994, under a multi-agency memorandum of understanding, designed to keep an at-risk species from needing to be listed under the Endangered Species Act. This Conservation Agreement, and accompanying Habitat Conservation Assessment, serves as the guide for management of the Cow Knob salamander.

Regarding the Cow Knob salamander, the GWNF's Forest Plan includes the following standards and desired conditions:

- Forest-wide Standard-45 If Cow Knob salamanders are found in areas outside the Shenandoah Mountain Crest management prescription (MP) area, those areas will be subject to the same management measures as described in the Shenandoah Mountain Crest MP Area 8E7.
- Desired Condition 8E7-06: Management activities limit negative impacts to Cow Knob salamander populations from permanent and long-term fragmentation, isolation, and edge effects (such as drying from increased insolation, impacts from edge predators, invasion of non-native invasive plants, and increased competition from other salamander species).
- No new permanent roads are constructed. Restoration of canopy and cover along temporary and decommissioned roads occurs quickly. Canopy closure along road rights-of-way is common. New trails may be constructed if no adverse effect on Cow Knob salamander populations will occur.
- Trail and road reconstruction, minor relocation, and new parking facilities are permitted. All activities are conducted with full consideration of effects on Cow Knob salamander populations.
- Regarding 8E7 Standard-026, these areas are unsuitable for designation of new utility corridors, utility rights-of-way, or communication sites unless there is an over-riding demonstrated public need or benefit. Existing uses may continue unless removal is necessary to protect threatened, endangered, sensitive, and locally rare species.

The Conservation Agreement states: "Utility and Transportation Corridors - Because corridors of any size will fragment Cow Knob salamander habitat and isolate populations on either side, new utility corridors must be sited around the SMC-SIA. When opportunities exist, utility corridors should be closed and allowed to revegetate naturally."

130. Analyze cumulative effects for the Cow Knob salamander, at a minimum including the effects of roads, rights-of-way, habitat loss, habitat fragmentation, and population isolation.

131. Table 3B-1 describes the small whorled pogonia as likely extirpated in Virginia. This is not true. Correct the table.

132. All federally listed and proposed species whose habitat occurs along all proposed route alternatives and/or are documented in route surveys on NFS lands must be addressed in section 3.7.1 of the final resource reports.

133. All known hibernacula, as well as maternity colonies, roost trees, and suitable habitat for all federally or state listed bat species for which the proposed and alternative routes come within activity zones as identified by the U.S. Fish and Wildlife Service should be identified, and effects of proposed actions be analyzed, in the final resource reports.

134. The list of federally recognized Indian Tribes identified for consultation on the ACP does not include all of the MNF tribal partners. The list of MNF tribal partners can be found at Appendix B of the permit issued for archaeological investigations on the MNF. It is a condition of that permit to provide copies of the technical report summarizing all activities authorized by the permit to MNF Tribal partners. The MNF will be glad to share contact information for those partners.

135. Table 4.7.1-1 is not accurate. The permit for archaeological investigations on the MNF, issued 4/27/2015, is limited to the initial survey corridor that was approved after going through the public scoping process. The subsequent permit to survey an alternative route (MNF5) is dependent on the public scoping process.

136. The Plan for the Unanticipated Discovery of Cultural Resources or Human Remains during Construction must be submitted to the Forest Service and Tribal partners for review. Unanticipated discoveries that occur on National Forest land shall adhere to FS guidelines, all relevant laws and regulations, and our obligations to Tribal partners.

137. The final resource report 4 should inform the Forest Service about what alternatives are available for avoiding and minimizing disturbance or destruction of heritage.

138. There is a concern about increased threats to cultural resources on NFS lands, such as looting of cultural sites and metal detecting civil war sites, in addition to other illegal activities (e.g., increased illegal ATV use) that could result from increased access to the forest interior via the pipeline corridor and associated access roads. In order to protect cultural resources on NFS lands, explain what steps will be taken to prevent NFS lands from being accessed via the pipeline corridor and associated access roads.

139. The report concerning archaeological sites and historic standing structures communicated a disconcerting high level of cultural resources (90%) not deemed eligible for nomination or potential inclusion into the National Register of Historic Places. Without data available to review, it is unknown why these resources did not qualify, which sets a precedence of what may occur with other resources encountered during this survey. Review by the appropriate State Historic Preservation Officers and the ACHP will no doubt clarify this issue.

140. In the Section "Civil War Sites," please address impacts in relation to the proposed expanded boundaries of the Camp Allegheny and Cheat Mountain sites, as we requested previously in our scoping comments. Additionally, this section states that the sites are "not intact." At this time, none of the alternatives have been surveyed for the identification of cultural resources. To claim that Battlefield areas are not intact is not appropriate until such surveys have been conducted.

141. As requested in the scoping comments, please include a section that addresses all heritage resources, in addition to Civil War sites.

142. Section 6.1 provides regional-scale settings. In addition, provide physiographic, geologic, and topographic settings specific to the GWNF and MNF at a project-level scale.

143. Explain the method that was used to estimate slope in Table 6 1-1. Given that slope steepness is such an important part of the landscape characteristic in the analysis of the feasibility of implementation of this pipeline, provide a more detailed display and analysis of slopes on the National Forests.

144. In section 6.2, discuss the scale and suitability of the data source used to estimate potential areas of shallow bedrock areas that may require blasting on the NFS lands (Table 6 2-1). Include engineering geologic field investigation in the geotechnical studies planned to provide site-specific estimates of shallow bedrock that may require blasting on the National Forests.

145. Note the general comment on section 6.4: Geologic hazards are geologic processes or conditions (naturally occurring or altered by humans) that may create risks to public health and safety, infrastructure, and resources. Provide site-specific assessments of the potential for the ACP project to affect or be affected by geologic hazards on National Forest lands.

146. In section 6.4, describe the affected environment of geologic hazards in a site specific manner for the ACP project on the GWNF and the MNF.

147. Consider changing title of section 6.4. from "Faulting" to a title such as "Surface Faulting" in order to reflect the specific hazard addressed in this section.

148. Consider the seismographic record for epicenters and depths of earthquakes in the vicinity of the proposed pipeline. Consider that earthquakes with recorded epicenters indicate

Quaternary/Holocene/historic faulting at depth, regardless of whether the faulting reached the ground surface.

149. Distinguish between "quaternary faulting" and "quaternary surface faulting." Quaternary surface faulting is a subset of a quaternary faulting which includes subsurface faulting at various depths as well as surface faulting.

150. Section 6.4.2, Landslides, uses such national and regional level data sources as *Landslide Overview Map of the Conterminous United States* (Radbruch-Hall et al. 1982), as well as *Swelling Clays Map of the Conterminous United States* (Olive et al. 1989) and the 1996 FEMA study mentioned in the draft resource report. Such national and regional level studies may provide some general overview for the ACP project, but such general studies are inadequate to assess site-specific effects of the project on the NFS lands. In section 6.4.2, describe the affected environment for existing and potential landslides in a site specific manner for the ACP project on each Forest. Provide site-specific geologic maps of consolidated and unconsolidated deposits, and geologic structures, such as dip slopes and the orientation of bedrock discontinuities (bedding, joints, and other fractures). Consider the types of landslide relevant to the site-specific geologic setting, such as debris slides, debris flows, slumps, rockslides, and rockfalls. Conduct on-site engineering geologic investigation and mapping such as described by Keaton and DeGraff (1996).

151. Identify existing slope stability conditions in the footprint and upslope or downslope of the footprint of the proposed facilities (such as existing landslides; streamside slopes subject to undermining by streams; geologic structures that may be adverse to slope stability such as dip slopes; existing or potential debris flow paths).

152. The draft Report states: "The most significant landslide event documented in the areas crossed by the Projects occurred in 1969 in Nelson County, Virginia. As Hurricane Camille moved east from the Gulf Coast, it stalled over the Blue Ridge Mountains resulting in more than 30 inches of rain in less than 8 hours. The intense rain produced numerous landslides and severe flooding that led to the deaths of more than 150 people, 100 injuries, destruction of more than 100 bridges, and more than $150 million in property damage (Virginia Department of Emergency Management, 2013a; Morgan, et al., 1999). As shown in Figure 6.4.2-2, ACP has adopted an alternative route that avoids a majority of the documented debris flow and flood effects from Hurricane Camille (USGS, 1999b). This alternative is discussed in more detail in Section 10.8.1.6 of Resource Report 10."

Address the assumptions and rationale behind the statement: "Atlantic has adopted an alternative route that avoids a majority of the documented debris flow and flood effects from Hurricane Camille (USGS, 1999b)." Storms like Hurricane Camille that triggered a dense network of debris flows have resulted in a reduction of the volumes of debris flow source materials in many hollows and mountainsides impacted by the storms. In areas where historic storms triggered debris flows and reduced debris flow source materials, the scope and magnitude for potential debris flow activity may be less than in areas where large volumes of debris flow source materials remain intact and not reduced by historic and Holocene storms.

153. In regard to potential debris flows, there may be rationale for adopting an alternative that avoids the majority of the Hurricane Camille impacted area, but that rationale needs to be explained with a comparison of debris flow potential of the two alternatives.

154. Clarify the discussion to prevent a misunderstanding that in the Blue Ridge, Valley and Ridge, and Appalachian Plateau the pipeline routes in areas with no historic debris flows are necessarily safer from debris flows than routes in areas of historic debris flows events. Recognize that the specific locations of future intense storms is unknown, but there is a potential for intense storms to occur anywhere along the pipeline corridor.

155. Consider the frequency of debris flow events, including the major debris flow events in Virginia and West Virginia from 1949 to 1996 (Figure 1). Recognize that the ACP project is in the vicinity of these major debris flow events in Virginia and West Virginia from 1949 to 1996, and assess the potential for future debris flows events to occur on the part of the ACP project on the GWNF and MNF. Recognize that intense storms can occur in any hurricane season as well as outside the hurricane season.

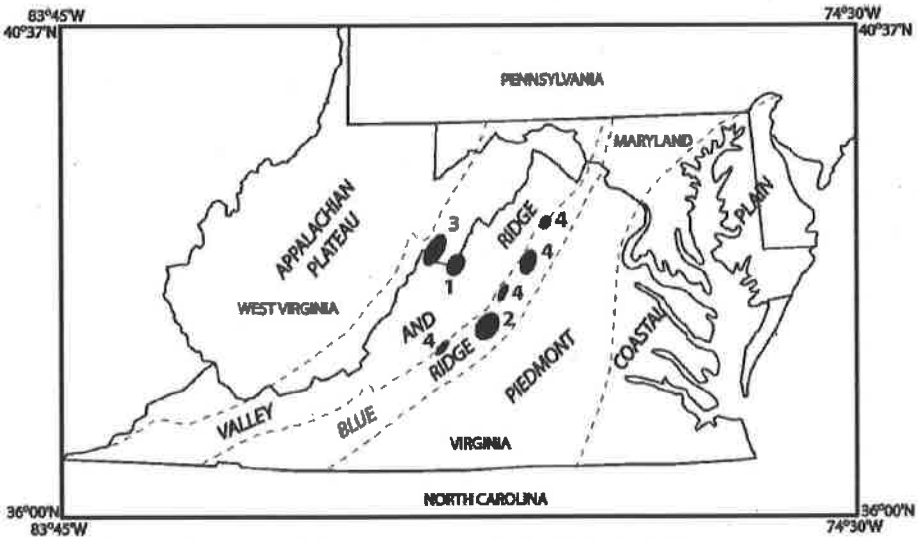

Figure 1. Areas affected by debris-flow events in Virginia and West Virginia from 1949 to 1996. 1—June 17–18, 1949, storm in western Virginia and eastern West Virginia; 2—August 19–20, 1969, storm in western Nelson County, Virginia; 3—November 3–5, 1985, storm in western Virginia and eastern West Virginia; 4—June 27, 1995, Rapidan storm in several counties bordering Blue Ridge Mountains.

Figure 1. Role of debris flows in long-term landscape denudation in the central Appalachians of Virginia (Eaton et al. 2003).

156. The draft Report acknowledges a consent order with WVDEP to address violations primarily associated with slope failures along DTI's G-150 pipeline resulting in sediment deposition in adjacent waterways. Provide details about these G-150 pipeline slope failures sufficient to characterize the geotechnical/engineering geologic factors involved so that the potential for similar slope failures can be assessed on the ACP project. The WVDEP database contains evidence of other permit violations. Address whether this indicates a pattern of difficulty achieving compliance. Provide thorough documentation of the demonstrated effectiveness of slope stabilization techniques and remedial actions proposed for use on National Forests.

157. The draft Report states: "Due to the high potential for landslide in Pennsylvania, West Virginia, and western Virginia along the proposed pipelines, Atlantic and DTI will conduct site-specific geotechnical studies along the proposed facilities in these areas to assess the potential for landslides to occur during construction and operation of the Projects. The results of this analysis will be provided upon completion." Please note that ACP would need to contact the Forest Service for permission to do geologic surveys because ACP did not request permission to conduct geology studies under the current permit (at least on the GWNF).

158. For section 6.4.3, expand title from "Mine Subsidence" to "Mine Subsidence and Coal Mined Land" to reflect broader hazards. Identify the "mining/reclaimed mining/restored" areas that would be traversed by the proposed pipeline. Identify, investigate and map any surface coal mines, workings, spoil piles, abandoned facilities within or near the proposed pipeline route and identify hazards associated with those areas. Identify, map, and test for acid-generating potential any coal spoil/waste intersected by the proposed pipeline.

159. The map shown in Figure 2 illustrates the known locations of areas impacted by former mines and provides the history of the area that should be considered when collecting data, identifying effects, and conducting the analysis.

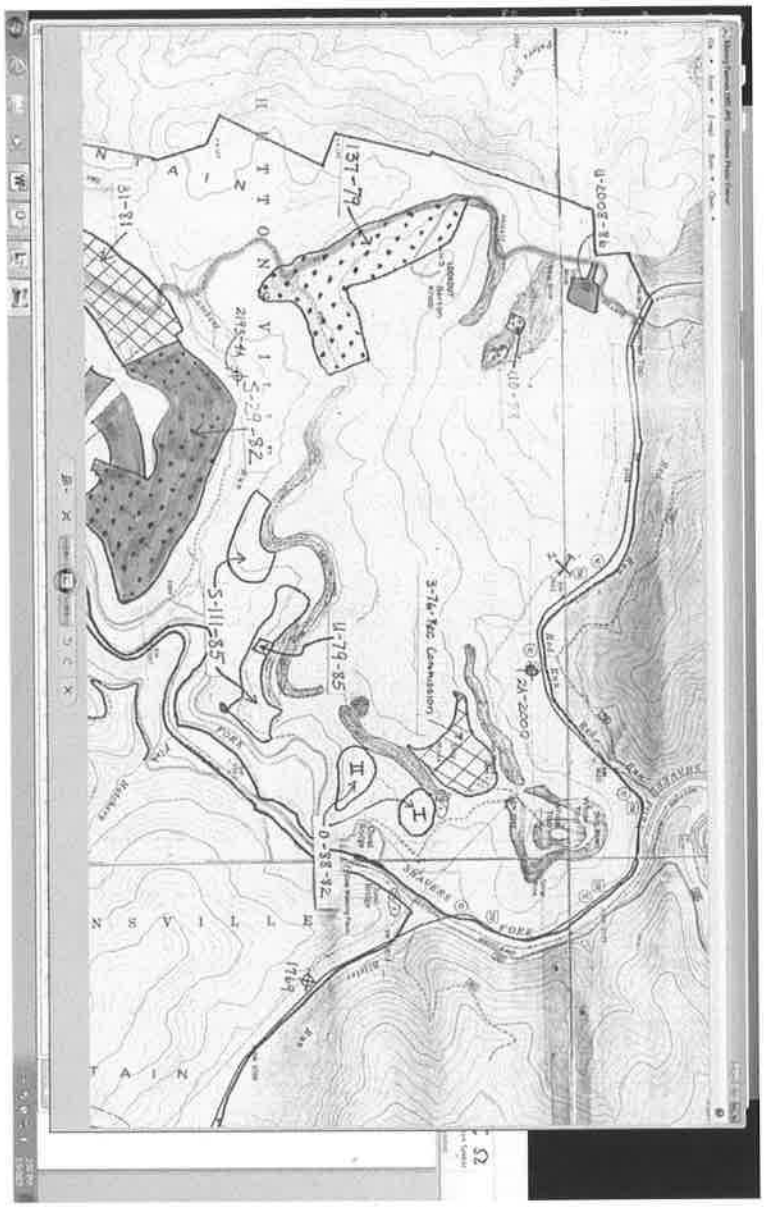

Figure 2. Old Coal Mine/Strip Workings on the Monongahela National Forest.

160. Identify, investigate and map any known or discovered landfills, and underground mine workings. Pipeline construction may unknowingly intersect improperly disposed or discarded mine related fluids or hazardous materials in underground workings.

161. Table 6.4.3-1 addresses abandoned underground mines. Currently the inventory for West Virginia abandoned mine lands is incomplete and not up to date. A thorough independent investigation with ground penetrating radar should be used to verify that underground mines are at least 100 feet or more below the proposed route in areas where historic mining has occurred.

162. Identify, investigate and map the geology of any major stream crossings. Boring under streams and rivers may intersect un-mined coal units or other soft units or limestone units that could allow for unstable pipeline bedding, water interaction, transmission of fluids through cracks and fractures and cross connectivity issues affecting water quality and water quantity.

163. In section 6.4.4, identify karst on NFS lands. Identify and map the extent and depth of any sinks, sinkholes, caves that may exist within or near the proposed pipeline route, staging area and associated new roads. See the Forest Service's scoping comments and comments herein, and consult with the Forest Service for further information on study requirements on NFS lands. Consider consulting with local cave experts.

164. In section 6.4.5, address whether any acid-producing rocks and soils are identified on NFS lands. Discuss the potential effects of corrosiveness on pipeline infrastructure and effects of acidic water run-off on vegetation and water bodies.

165. Include a cross-reference to resource report 7, specifically the section on soil chemistry, for a discussion about base poor nutrient soils and the highly acidic soils which occur on the MNF, which is a separate issue from acid rock drainage from iron pyrite.

166. In section 6.5, discuss the known or potential paleontological resources on NFS lands. Note that the U.S. Department of Agriculture is implementing regulations under the Omnibus Public Land Management Act of 2009 (USDA, 2009) paleontological resources preservation subtitle. The regulations at 36 CFR Parts 214, 261, and 291 provide for the preservation, management, and protection of paleontological resources on NFS lands.

167. In order to assess impacts, the location and magnitude of the proposed slope modifications (excavations and fills) should be identified in section 6.6.1. Provide plans and typical drawings showing the dimensions of the slope modifications (cut and fill) for each type construction to be located on NFS lands:

a. access roads to pipeline right-of-way corridor (incudes new construction and reconstruction);
b. pipeline right-of-way excavation for trench (ditch);
c. pipeline right-of-way excavation for roads (travel area and working area);
d. pipeline right-of-way loose material from trench excavation (ditch spoil storage);
e. pipeline right-of-way topsoil (topsoil storage);
f. pipeline right-of-way loose material from construction road excavation (travel area and working area);
g. ATWS;
h. contractor yards and equipment staging/storage areas; and
i. disposal areas for excess excavation or other materials.

168. In draft Resource Report 1 Appendix 1-D, most of the typical drawings are for flat ground where the only excavation is for the trench. These flat-land typical drawings show "Ditch Spoil Storage" and "Topsoil Storage." Provide construction typical drawings for the range of slopes (%) requiring side hill excavation on the GWNF, including a typical drawing for

the maximum slopes (%) to be excavated in the construction right-of-way on the GWNF. Label the loose material from all sidehill excavations not just the trench excavation. Provide post-construction typical drawings for the reclamation showing the areas of reclaimed cut and fill in relation to original ground surface.

169. Bedrock excavation of the side hill and in trenches will swell loose volumes compared to in-place volumes. Some trench excavation may not be suitable backfill, and fill may need to be imported into right-of-way for trench backfill. Considering these two factors, calculate a mass balance to determine if there will be excess excavation on the GWNF that will need to be disposed of outside the right-of-way.

170. In addition to side hill excavation that is parallel or sub-parallel to slope contours, a second type of construction is downslope excavation that is perpendicular or sub-perpendicular to slope contours (as discussed in section 1.5.2.4, Steep Terrain). Much of the right-of-way excavation on NFS lands appears to be this second type of excavation (downslope excavation). Provide construction typical drawings and map locations for the range of slopes (%) requiring downslope excavation on NFS lands, including a typical drawing for the maximum slopes (%) to be excavated on the GWNF and MNF. Also provide post-construction typical drawings for the reclamation showing the areas of reclaimed cut and fill in relation to original ground surface.

171. Identify any proposed temporary construction access roads on the GWNF and MNF. If no access roads on the GWNF or MNF, identify how the corridor on the GWNF and MNF will be accessed.

172. Provide for the GWNF and MNF pipeline corridors a table similar to Table 6.1-1, Slope Classes Crossed by the proposed routes. Include a slope map showing these slope classes on the GWNF and MNF.

173. Winch line construction may be a subset of the downslope excavation that is perpendicular or sub-perpendicular to slope contours discussed above. Provide construction Typical Drawings for the range of slopes (%) and map locations requiring winch line construction on the GWNF and MNF, including a typical drawing for the maximum slopes (%) to be excavated on the GWNF and MNF. Provide post-construction typical drawings for the reclamation showing the areas of reclaimed cut and fill in relation to original ground surface.

174. Provide a map with symbols along the pipeline on the GWNF and MNF showing sections with major differences in types of construction, including as a minimum:

a. side hill excavation that is parallel or sub-parallel to slope contours;
b. downslope excavation that is perpendicular or sub-perpendicular to slope contours and using winch lines; and
c. downslope excavation that is perpendicular or sub-perpendicular to slope contours and not using winch lines.

175. Provide a table listing the mileposts on the GWNF and MNF for sections with major differences in types of construction.

176. Provide a slope map for the watershed above and below the pipeline on the GWNF and MNF in order to assess the debris flow potential upslope from the pipeline, as well as potential for debris flows caused by fill slope failure from the pipeline project.

177. For the GWNF and MNF, provide a vertical profile along right-of-way centerline that displays slope % along the profile. Provide vertical profiles perpendicular to right-of-way centerline that display slope % at representative sections of ground slope variations along the right-of-way. Provide a slope map for the right-of-way based on the best available survey data.

178. In section 6.6.2, address areas of blasting and potential impacts on the GWNF and MNF. Discuss quantity and density used per shot and ground contamination effects from nitrate runoff. Describe proposed monitoring of nitrate with run-off.

179. In section 6.6.4.1, assess the potential effect of earthquake-generated ground shaking and ground acceleration on the ACP project on the GWNF and MNF. Provide a cross-reference to seismically induced landslides in section 6.6.4.2. Assess potential for 1) surface faulting on known faults and 2) potential for new faulting to rupture the ground surface (Collins 1990).

180. In section 6.6.4.2, provide engineering geologic assessment of 1) the potential for natural landslides to impact the project, and 2) the potential for ACP project slope failures (cut slopes and fill slopes) to impact resources and public safety downslope on GWNF and MNF.

181. Assess the potential for debris flow type of landslides to impact the pipeline and associated facilities on GWNF and MNF. Consider the frequency of debris flow events, including the major debris flow events in Virginia and West Virginia from 1949 to 1996 (see Figure 3).

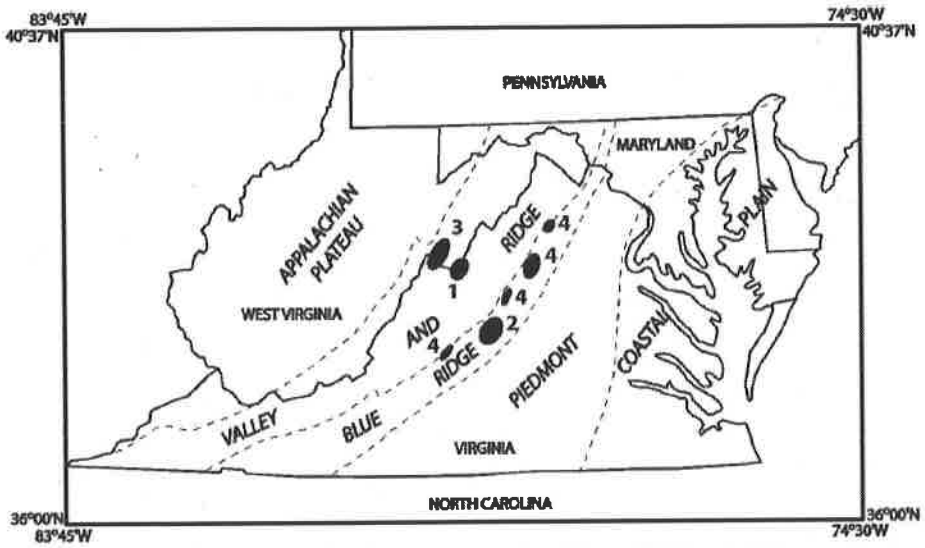

Figure 1. Areas affected by debris-flow events in Virginia and West Virginia from 1949 to 1996. 1—June 17–18, 1949, storm in western Virginia and eastern West Virginia; 2—August 19–20, 1969, storm in western Nelson County, Virginia; 3—November 3–5, 1985, storm in western Virginia and eastern West Virginia; 4—June 27, 1995, Rapidan storm in several counties bordering Blue Ridge Mountains.

Figure 3. Role of debris flows in long-term landscape denudation in the central Appalachians of Virginia (Eaton et al. 2003).

182. Assess the potential impacts on pipeline and access roads of swarms of debris flows, such as occurred in June 1949 in Augusta County (Figure 4) and in August 1969 in Nelson County (Figure 5).

Figure 4. June 17-18, 1949 storm triggered more than 100 debris flows in the Little River area on the North River Ranger District in Augusta County, Virginia (Hack and Goodlett 1960).

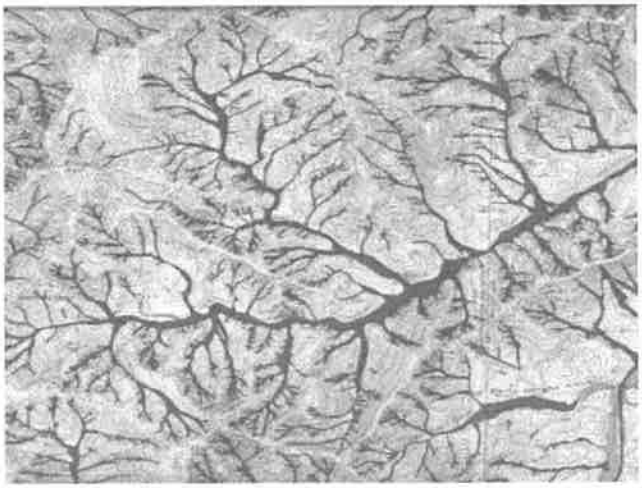

Figure 5. Debris flows in Davis Creek area triggered by remnants of Hurricane Camille August 19/20, 1969 in Nelson County, Virginia (Morgan et al. 1999).

183. Project-related slope failures (landslides): Assess the slope stability of proposed cut slopes and fill slopes during construction and operation of the pipeline, access roads, and associated facilities. Identify any risks to people, facilities, and resources associated with potential failure of slopes modified for the project.

184. Road fill slope stability: In considering the stability of road fill slopes, determine the slope % at which road construction would switch from cut-and-fill to full bench construction.

Prepare a slope map of the project area including areas of potential access road construction. Use slope % for cut-and-fill to full bench construction as one of the slope breaks in classifying slopes on the slope map. Identify methods and locations for disposal of excess excavation (such as from full bench road construction).

185. Trench backfill stability: In considering the stability of fill in pipeline trenches, determine the slope % at which fill in trenches would be unstable and subject to fill slope failure. Prepare a slope map of the project area. Use slope % at which fill in trenches would be unstable as one of the slope breaks in classifying slopes on the slope map. Identify methods and locations for disposal of excess excavation from the trenches.

186. Corridor road slope stability: The access roads to reach the pipeline corridor are a familiar type of road. In contrast, the road built in the pipeline corridor is a different type of road, cutting a wide swath across the landscape in order to accommodate heavy construction equipment traffic to dig the trench and install the pipeline. While different in scale and layout than an access road, the construction within the corridor is basically a wide road with an adjacent pipeline trench (see Figure 6).

Figure 6. Example of construction road with adjacent pipeline trench. Material excavated for the road is piled on uphill side of road; material excavated for the trench is piled in a berm on downhill side of trench.

187. Assess the slope stability of the corridor road and adjacent pipeline trench during construction and operation of the pipeline. Of special concern is the loose, unconsolidated material (soil, colluvium, weathered or fractured bedrock) resulting from the all types of excavation in the construction right-of-way and stored in temporary piles or berms. Calculate the volume (cubic yards) of loose, excavated materials and estimate the length of time these piles or berms remain in temporary storage before the material is used for backfill, is graded as part of reclamation, or hauled off the corridor as excess excavation.

188. If a significant rainstorm occurs during the time these temporary piles or berms are present (such as in Figure 6), it could result is a mass failure of the temporary piles or berms, and then, a debris flow that could produce off-site damage downslope and in stream channel s. Estimate the volume and stability of these temporary piles or berms using a typical cross-sections. Provide two types of project design cross-sections: 1) original ground surface, 2) final cut-and-fill. Provide a third or intermediate type project design cross-section to show temporary piles or berms as well as excavations (cut-slope); this design cross-section would show the construction at the point of maximum loose excavated material , that is, before the trench is backfilled (such as in Figure 4). Longitudinal profiles showing the slope % or grade along the corridor road at this stage of construction would also be needed to assess slope stability.

189. Project-related debris flows: Assess the potential for debris flows caused by failure of fill slopes created by the project (such as access roads, corridor road and pipeline construction, and associated facilities). Assess the potential for debris flows caused by failure of waste disposal areas (such as disposal areas for excess excavation along access roads, corridor road and pipeline). Assess risks to public safety, downslope infrastructure, streams and other resources associated with potential failure of fill slopes or disposal areas for the project (Collins 2008).

190. Seismically induced landslides: Assess potential for seismically induced landslides to impact the pipeline. Assess potential for earthquakes to trigger cut slope failure or fill slope failures originating on slopes modified by ACP project.

191. Slope Stability Mitigation: The draft Report states: "Atlantic and DTI will implement mitigation measures to stabilize areas identified in the site-specific geotechnical studies as having a high potential for slope failures." Please describe these mitigation measures. Include engineering geologic work in the site-specific geotechnical studies to insure the mitigation measures are based on sound understanding of the natural and project-altered geologic processes and materials related to slope stability.

192. Provide details about DTI's G-150 pipeline slope failures sufficient to characterize the geotechnical/engineering geologic factors involved so that the potential for similar slope failures can be assessed on the ACP project. What role, if any, did trench breakers and slope breakers have in the G-150 pipeline slope failures? In light of the G-150 pipeline slope failures, assess the adequacy of trench breakers, slope breakers, and other mitigation measures to control sediment movement, slippage or other mass movements on steep slopes. Consider need for additional measures.

193. In section 6.4.4.3, assess potential for mine subsidence on NFS lands.

194. Assess the potential for construction activities to expose reclaimed and stabilized acid generating coal spoil piles from the former strip-mining of the area.

195. Assess potential for construction activities to intersect underground coal mine workings, which could allow for water interaction, transmission of fluids, and cross connectivity issues that could affect water quality and water quantity. Assess the potential for construction activities to release water existing within the mine workings, which could affect the water table in the area.

196. In section 6.6.4.5, assess the potential for floods to impact the ACP project and the potential for the ACP project to affect flooding, for example, by failure of constructed slopes resulting in temporary landslide dam in narrow mountain valleys and hollows. Assess potential for flooding to affect pipelines, roads, and associated facilities. Assess the how the slope modifications in the pipeline corridor and access roads would affect surface water flows and runoff.

197. ACP proposes to implement design criteria and local permit requirements, where applicable, at all aboveground facilities located in designated floodplains. Please define and explain these criteria.

198. The potential for release of sulfuric acid from acid-producing rock into water bodies and wetlands is identified in section 6.4.6. Such a release could be a violation of the Clean Water Act. Elevated metals such as Al and Fe, and possibly Mn and Se. Discuss the potential for these reactions where acid-producing geology exists and water bodies in proximity to waterbodies and wetlands.

199. Include a cross-reference to the section on soil chemistry in resource report 7, to discuss potential effects relating to base poor nutrient soils and the highly acidic soils occurring on the MNF, which is a separate issue from acid rock drainage from iron pyrite.

200. Resource report 7 discusses the existing condition of the soil resource but fails to analyze how the proposed activity of building the pipeline will affect the soils in detail. Please explain the effects to soil carbon stocks, hydric soils, soil stability, compaction, soil chemistry, and other facets of soil health.

201. Revise the final resource reports to include information on soil chemistry, specifically, soil pH and the potential for the corrosive nature of soils, and the effects on the pipeline and cementing agents and/ or other alkaline substances used within the trench to stabilize the pipeline. Soil chemistry analyses are also required to determine the cumulative effects of soil disturbance on soils that are low in base cations and nutrients.

202. On page 7-15, provide literature references to document the effectiveness the proposed techniques for slowing the velocity of water and runoff. Describe proposed monitoring measures to identify and methods for correcting ineffective techniques for slowing water runoff on NFS lands. List the criteria for success.

203. On page 7-16, provide literature references to document the effectiveness of temporary sediment barriers. Describe proposed monitoring measures to identify and methods for correcting ineffective sediment barriers on NFS lands. Sediment barriers should be used in any location that ground water or subsurface flows are intercepted during construction. See the Forest Plans and state minimum standards.

204. Note on page 7-16 that mulch must be applied to all disturbed soils on the MNF.

205. Page 7-3 discusses the use of SSURGO data and refers to it as "the most detailed level of soils information for natural resource planning and management." This statement is incorrect. The most detailed level of analysis is an order 1 level soil survey. SSURGO is an order 2 level soil survey. Approximately 5 acres is the smallest polygon represented on a landscape.

206. On page 7-4, include soils with thick O horizons (5 inches or more).

207. Page 7-4 identifies coarse-textured soils and soils with slopes greater than 8 percent as areas of concern for revegetation. Extreme acidity will also be an issue and should be discussed here. Liming and fertilizing may not be permitted in certain areas (e.g. in or near naturally acidic ecosystems). Consult with the Forest Service for more information.

208. Shallow-to-bedrock soils are defined incorrectly on page 7-5. Shallow to bedrock for the soil survey definition equates to soils less than 20 inches to bedrock. Depth class to 60 inches are considered deep soils and any depth greater than 60 inches is defined as very deep.

209. Section 7.2.2 describes soils in the Eastern Allegheny Plateau and Mountains. This description should include the O horizons, which are critical at high elevations for preserving soil health components for microbial communities. It is more important to acknowledge the soil series that have this potential and identify those in this section.

210. Table 7.4 1-1: Pocahontas County compaction value and Table 7.4: 1-1: Pocahontas County depth to bedrock. Clarify the source of these values.

211. On page 7-12, a statement indicates that deep topsoil does not occur on the majority of the proposed route. This is not true for the section that crosses the MNF, which highlights the need for an order 1 soil survey. "Deep" should be defined for the ecosystems that occur along the proposed route.

212. Temporary and permanent erosion control measures are discussed on page 7-15. Identify how and to where material and debris from erosion control measures will be moved.

213. In the summary table, a list of soil series by milepost and a description of their characteristics, not soil associations must be used as a filing requirement. SSURGO soil survey maps should be field verified using protocols described below.

214. In section 7.1.2, identifying surface textures of sandy clay loam or finer is not useful because surface soil horizons are segregated with the topsoil and these finer textures for surface horizons is unusual for soils on these NFS lands. It would be more realistic to query for textures of subsoil horizons because these will be the soils impacted by construction activity.

215. On NFS lands, O and A horizons, and transition soil horizons AB and BA, must be segregated.

216. Wet soils on NFS lands are considered to be those that are moderately well drained or wetter and where subsurface water tables are within 18 inches of the soil surface. Topsoil on the GWNF will be defined as the O and the A, and the AB or BA horizons determined onsite.

217. In section 7.4.1.4, to minimize and avoid potential impacts, ACP must use Forest Plan Standards and Guidelines for revegetation and erosion control. Monitoring of temporary erosion control structures during construction by company inspectors must be documented with site locations and photos and reported to the Forest Service. Part of "successful" restoration will be eliminating illegal vehicle access opportunities onto the pipeline corridor.

218. The GWNF LRMP requires implementation of the measures provided in the Virginia Erosion and Sediment Control Handbook (Virginia DEQ 2015) minimize impacts to soils.

219. The GWNF Forest Plan Standards and Guidelines must be applied as sideboards to the proposed action in guiding the planning and implementation of the project if the decision is made to allow a project. These standards and guidelines will be followed and referred to as the effects analysis is prepared for the soil resource.

220. Soil corrosiveness should be included in the list of soil characteristics evaluated given the highly acidic nature of some of the soils in the corridor.

221. In addition to prime farmland designated soils, soils designated as soils of state wide importance will need to be identified on both forests.

222. Because the soil survey data being used for this report is mostly mapped at 1:24000 scale meaning that no polygon or soil map unit is mapped less than 5 acres in size, smaller inclusions of soils with different properties than those mapped will not be shown. Verifying the soil maps for the MNF and GWNF will be necessary to determine impacts, consistency with the Forest Plan, and other information.

223. The following protocols will be followed when verifying the soil survey information on the GWNF:

- Use USDA NRCS Web Soil Survey (WSS) for basic soil survey maps for the area.
- Survey area includes possible road locations and other associated facilities.
- Field verify soil survey maps with field soil profile descriptions. At least one description for each map unit occurring in the pipeline or road construction corridor. Identify soils not included in map unit descriptions found in the WSS. GPS field profile descriptions and areas of apparent slope failure, wetness and rock outcrop.
- Soil profile descriptions will use the protocols in the "Field Book for Describing and Sampling Soils," National Soil Survey Center, Natural Resources Conservation Service, USDA.
- Field soil profile descriptions will include field pH and slope.
- Field notes will include a decision on whether the soil profile description fits the map unit description or not and why.
- ACP Soil Survey contact will consult with Forest Service soil contact biweekly or more often if needed for discussion of field survey progress.
- Field soil profile descriptions will be to at least 40 inches or bedrock using a bucket auger or shovel. Justification for bedrock decision is needed.
- Deliverables of a final map and spreadsheet showing locations and summary of each field description and a notebook containing original field notes will be received by Forest Service.
- Field notes can include observations on surface features, such as wetness, slope failure, karst, outcrops, shallow rooting, root wad descriptions, road cut notes, etc.

224. Post-construction and post-disturbance monitoring for revegetation should be conducted in perpetuity, for the life of the project on NFS lands. The Forest Service would require this due to steep slopes, the low natural fertility, rockiness and droughtiness of certain soils in the right-of-way—factors contributing to ongoing problems the Forest Service is currently experiencing with other projects on NFS lands. Consult with the Forest Service for other requirements for revegetation, such as reporting requirements.

225. Data presented in Tables 7.4 1-1, Pocahontas County rockiness, and 7.4 1-2, Pocahontas County, topsoil thickness, is not accurate at this scale. Please revise the tables in the final resource reports to use site-specific information from the field surveys.

226. Soil disturbance can disrupt soil microbial communities and hasten the loss of nutrients through erosion and greater exposure to weathering. Please analyze the potential for the proposed activities to degrade soil microbial populations and cause the loss of nutrient capital. The Forest Service requests this information in order to ascertain project effects on soil quality.

227. Acidic, nutrient-poor soils along parts of the proposed route would not be conducive to establishing and maintaining grasses. The Restoration and Rehabilitation Plan should address restoration in acidic, nutrient-poor soils and include a long-term monitoring and maintenance to ensure success.

228. In 8.7.1.1, under the GWNF LRMP, address the pertinent Design Criteria for Lands and Special Uses (LRMP 4-23, 24). For example, Standard FW-244 states that new authorizations outside of existing corridors require an amendment to the Forest Plan.

229. In 8.7.1.1, include a discussion of the environmental reasons why NFS lands were chosen for the trail crossing rather than National Park Service Lands (NPS) lands.

230. In 8.7.1.1, include a discussion of all components (both forest-wide and management prescription-specific) of the Forest Plans applicable to the proposed project, not just those components that address special uses and utility corridors.

231. In Table 8.7.1-1, disclose the acres of MPs (as opposed to MPUs) 3 and 13 (MNF and GWNF, respectively) affected by the proposed project. Impacts include limitations in utilizing prescribed fire and timber harvest as a tool to achieve Forest Plan objectives. Restrictions on post-construction land use in the pipeline corridor should be described in much more detail in section 8.3. In particular, we are concerned about restrictions on future crossings by roads, trails, skid trails, and heavy equipment, as well as restrictions on vegetation management, including fire suppression and application of prescribed fire. These indirect impacts may include limitations or elimination of these tools in areas near the right-of-way or blocks of otherwise manageable lands isolated by the right-of-way.

232. Disclose the acres and percent of Forest/Woodland impacted that is suitable for timber production. Not all Forest/Woodland acres are appropriate for this land use. We can provide designations of those lands currently suitable for timber production.

233. Acknowledge that NFS timber will be cruised, marked and appraised to Forest Service standards in order to obtain appropriate compensation in section 8.3.

234. Disclose the impact of the proposal on the existing White Way Timber Sale (under contract), the Jennings Grouse Timber Sale (planned for 2018), both in Augusta County, VA, and the Burner Mt. PL Timber sale, scheduled to be sold in 2015, located in Pocahontas County, WV. Disclose the impact of the South Shenandoah Mountain Block prescribed fire project (currently being planned in Augusta, Bath, and Highland Counties, VA) and the Chestnut Ridge prescribed fire in Randolph County, WV.

235. Closely coordinate with Forest Service District and Engineering staff as locations for access roads are developed. Some access routes will likely serve as permanent access for pipeline maintenance and if appropriately located, could serve NFS resource management as well.

236. In section 8.3, restrictions on post-construction land use in the pipeline corridor need to be described in much more detail. Activities that will not be allowed need to be stated specifically. In particular, we are concerned about restrictions on future crossings by roads, trails, skid trails, and heavy equipment, as well as restrictions on vegetation management, including fire suppression and application of prescribed fire.

237. Paragraphs preceding section 8.1 provide specific locations for facilities (mainline, lateral lines, compressor stations) by milepost. For the three types of aboveground facilities, locations are not provided, which seems inconsistent. Consider adding a statement to Metering & Regulating Stations, Valve Sites, and Pig Launcher/Receiver bullets "Table 1.3.1-2 identifies the locations." The location of all pipeline facilities, access roads, and associated areas is of critical importance to the Forest Service staff reviewing the proposal for impacts on NFS lands and resources.

238. In section 8.2.5, it would be helpful to cite the location where additional information on collocation is found in resource report 10.

239. In table 8.2.5-1, Collocation with Existing Right-of-Way, it would be helpful to add columns to this table for total length (miles) for each Project/Facility and the percentage of those total miles that are proposed for collocation.

240. In section 8.7.1 the list of plans and other documents that provide standards and guidelines should include the Forest Service Manual and Forest Service Handbook.

241. The fourth paragraph on page 8-27 lists the names of the MPs on the MNF that would be crossed by the proposed ACP. The correct name for MP 4.1 is "Spruce and Spruce-Hardwood Ecosystem Management."

242. The last paragraph on page 8-28 states, "moreover, utility corridors in this MPU are viewed as compatible with the goal of minimizing disturbance to wildlife populations and Recreation Opportunity Spectrum (ROS) settings." This sentence is a misinterpretation of part of the desired condition section of MP 6.1. The pertinent part of the desired conditions reads, "special uses and facilities such as utility corridors are compatible with minimizing disturbance to wildlife populations and the ROS settings for the area." Because this sentence appears in the desired condition section of the MP, it is an aspirational statement, not a blanket statement that all such uses are consistent with the emphasis of the MP. The desired conditions section is saying that if/when the Forest Service decides to approve special uses or facilities in this MP, such uses will be designed to be consistent with minimizing disturbance to wildlife and the ROS settings for the area. Therefore, the subject sentence in the last paragraph of page 8-28 needs to be removed.

243. The first full paragraph on page 8-30 states that only one of the MNF MPs that would be crossed by the proposed ACP contains standards and guidelines applicable to linear rights-of-way. This statement is incorrect. Although MP 6.1 may be the only MP that contains a standard or guideline that specifically mentions utility corridors, many other standards, guidelines, goals, objectives, etc. in all three MPs could apply due their applicability to vegetation management, ecosystem restoration, and other activities. Please correct paragraph.

244. In section 8.7.1.1, on page 8-30, at the end of the first paragraph, add the Glenwood-Pedlar Ranger Districts (the proposed AP-1 mainline route crosses the GWNF in Virginia in the North River and Glenwood-Pedlar Ranger Districts).

245. The second paragraph under section 8.7.1.1 should be reworded to better describe the multiple uses provided by the GWNF instead of emphasizing only water, recreation and timber. In the list of watersheds provided in the second paragraph, add that the GWNF is the largest federal land holding in the Chesapeake Bay watershed.

246. The third paragraph describes the relation of the proposed route to a Potential Wilderness Area. The name of the Recommended Wilderness Study Area should be provided. It is presumed to be the Ramseys Draft Addition. The proposed route and one alternative route are relatively near three other Potential Wilderness Areas:

- Galford Gap Potential Wilderness Area on the Warm Springs Ranger District is approximately 4,700 feet SW of MP 84;
- Crawford Gap Potential Wilderness Area on the North River Ranger District is approximately 2,500-3,000 feet south of the proposed route at about MP 115.4; and
- the AT South Major Route Alternative (selected as preferred) runs within several hundred feet of the Kelley's Mountain Potential Wilderness Area on the Glenwood-Pedlar Ranger Districts.

If the routes should change and go through any of the Potential Wilderness Areas or a Recommended Wilderness Study Area, more analysis will be required to determine the effects on the roadless character of these areas.

247. Page 8-32 contains a reference to Appendix 8I providing analysis of ACP's compliance with applicable LRMP standards and guidelines for the MNF and GWNF. However, the list of Appendices on page 8-iv indicates that Appendix 8I is the Appalachian Trail Site Specific Plan.

248. In the first paragraph of the "Impacts and Mitigation" section on page 8-32, the statement is made that "...the ACP may not be able to conform to every applicable standard and guideline in the LRMP, in which case a plan amendment or exception would be required." Please revise the text to clarify that the Forest Service granting such an amendment would be considered only to the extent that they do not adversely impact pursuit of the management emphasis, goals, objectives, and desired conditions associated with the subject MP or Forest-wide direction, and to the extent that they are consistent with law, regulation, and Forest Service directives.

249. At several locations in resource report 8, the MNF is divided into six Management Prescription Units (MPU). This terminology is incorrect. The MNF is divided into six MPs.. The term MPU refers to the individual map polygons that are assigned to a particular MP. There are many more than six MPUs on the MNF.

250. In section 8.7.1.1, beginning on page 8-30, the fact that the Monongahela NF is detailed first leads to less complete and more inaccurate detail of the GWNF. First paragraph – the proposal crosses both the North River Ranger District and the Glenwood-Pedlar Ranger Districts. The correct term is Shenandoah Mountain Recommended National Scenic Area. The reference to MPUs is correct for the MNF, but is inaccurate for the GWNF. The second and third paragraphs on page 8-31 give short and inaccurate shrift to the portions of the GWNF that the pipeline is proposing to pass through. Although most of it is Management Area (MA) #13 (not MPU Code #13), this management area, and all management areas on the GWNF, include

significant amounts of dispersed recreation use and activities. Dispersed recreation use is not limited to MA 7E – it is the major emphasis in that management area, but it occurs in significant amounts in all management areas across the forest.

251. In section 8.7.1.1, on page 8-30, the statement is made that the proposed AP-1 mainline route crosses the GWNF in Virginia, in the North River Ranger District. On page 8-31, the report addresses the distance the proposed AP-1 mainline route is within the "Appalachian National Scenic Trail Corridor." There is no (MPU Code 4A) within the North River Ranger District. The report should state that the AP-1 mainline crosses the North River Ranger District and the Glenwood-Pedlar Ranger Districts.

252. In section 8.7.1.1, beginning on page 8-31, and beginning with the fourth paragraph, the description of the emphasis in MA # 4A (Appalachian National Scenic Trail Corridor) is biased and deceptive. It gives the impression that utility rights-of-way are one of the primary emphases of this management area. All of that is covered in the description, emphasis, and desired conditions of this management area – which is explicitly designed for the protection and management of the Appalachian National Scenic Trail. The two standards quoted are simply an acknowledgement that if any utilities must be located close to the Appalachian National Scenic Trail, they be limited to a single minimized crossing and be extensively mitigated. Clear preference is given to not locating utilities within the defined management area. As currently written, this section shows clearly biased editing.

253. In section 8.7.1.1, page 8-32, the statement that the proposed ACP would be consistent with most elements of the LRMP is confusing. Please clarify what elements of the LRMP the ACP Project would and would not be consistent with.

254. In section 8.7.1.1, on page 8-32, the statement is made that "...the ACP may not be able to conform to every applicable standard and guideline in the LRMP, in which case a plan amendment or exception would be required." Identify which standards and guidelines that could not be met in order to make a substantive comment. Additionally, the report should specifically identify whether the proposal will meet the Scenic Integrity Objectives.

255. In section 8.7.1.1., beginning on page 8-33, the description of the Appalachian National Scenic Trail as a special area is incomplete, inaccurate, and misleading. NPS and Forest Service do not own or control nearly the entire Appalachian National Scenic Trail. It is unclear whether the 2nd paragraph under Appalachian National Scenic Trail on page 8-33 is accurate. Further, "local trail maintenance clubs" should be "ATC-affiliated Local Appalachian National Scenic Trail Trail Clubs." The statement that 100 people per year try to hike the entire trail is inaccurate. There should be a statement about the 2-3 million visitors to the Appalachian National Scenic Trail per year, per the NPS official estimate. This section of the Appalachian National Scenic Trail, due to its proximity to roads, urban areas, and Shenandoah National Park, should be considered to be one of the more heavily used areas of the overall Appalachian National Scenic Trail. Per previous comments on the description of the horizontal directional drill construction technique, much more information is needed on the specifics of the placement, length, and other specifications of this technique in this location for this purpose.

256. In section 8.7.1.1, on page 8-33, an approximate mileage point of 153.7 is noted as the point for crossing the Appalachian National Scenic Trail. More information is needed as to the area of horizontal directional drill in order to make an informed comment on viewshed impacts to the trail in that area. A visual analysis needs to be provided from the trail itself in that vicinity as well as nearby Blue Ridge Parkway overlooks. There is concern that the corridor will be highly visible from Cedar Cliffs area along the Appalachian National Scenic Trail.

257. In section 8.8.1, address the MPs from the MNF Forest Plan for the Blister Run Swamp National Natural Landmark and Botanical Area and Gaudineer National Natural Landmark and Scenic Area. Though the proposed route would not directly cross certain recreation areas, it is close enough to affect recreation in those areas. This section should identify the distance from the proposed project to these unique areas.

258. In section 8.8.1, please note the correct names for the following sites: Blister Run Swamp Botanical Area/National Natural Landmark, Gaudineer Scenic Area/National Natural Landmark, and Buffalo Lake.

259. In section 8.8.3, on page 8-33, the report states that data on usage of specific segments of the trail is difficult to obtain, and could be of limited value given the range of hike durations and locations of trail entrances and exits. That statement may be true for some areas, but downplays known use of the trail in this area. The Reeds Gap parking lot along the Blue Ridge Parkway exceeds capacity each weekend and frequently during the weekdays. It is a key portal to the trail for hikes in either direction. Use numbers could be obtained from Ridgerunner Reports and Blue Ridge Parkway data. The elevation of the horizontal directional drill bore entry and exit points is a critical piece of information to have in order to comment on overall impacts to the Appalachian National Scenic Trail.

260. In section 8.8.3, page 8-48, a reference to Braley Pond Day Use Area states that the AP-1 mainline lies within 0.4 mile of the site. There is no mention of Sherando Lake Recreation Area in this section or in any of the reports. Sherando Lake is the busiest recreation area on the GWNF and includes both day use and overnight areas. Identify what distance to what part of a recreation facility was used to either include or exclude from analysis. The entrance to Sherando Lake is within 0.14 miles of the route. There is a day use parking area at the entrance used by hikers, bicylclists, fishermen, and hunters. In addition, State Route 664 which parallels the ACP route, is used as a loop return route for cyclists using the Torry Ridge Trail (FT#507).

261. In section 8.8, Recreation and Special Interest Areas, the first sentence under this section provides a general list of recreation and special interest areas on public lands and includes recreational rivers. Consider either expanding that to rivers, ponds and lakes, or changing the wording to recreational waters. There are numerous flood control dams in the area that provide ponds and lakes enjoyed by anglers, kayaker and canoeists, bird and other wildlife watchers, picnickers, and other recreationalists.

262. The correct terminology is Recommended Wilderness Study Areas, not proposed Wilderness Areas. The discussion of fishing and hunting in this section should be expanded, and should also include non-consumptive types of dispersed recreation activities on the GWNF.

263. In section 8.8.2, the reference to recreational visits is outdated. This should be updated to state that the average annual recreational visits to the George Washington and Jefferson National Forests (GWJNF) were approximately 2.3 million in 2011.

264. In addition to Braley Pond being listed as a developed site that may be affected by the proposed project, Shaws Fork Horse Campground and trailhead should be included. Shaws Fork is located just north of where the proposed project crosses State Route 616 in Augusta County (approximately at MP 103.3).

265. The Appalachian Trail South Major Route Alternative will impact access to Sherando Lake Recreation Area, the most heavily visited developed recreation area on the GWJNF. That route will also be very near Mount Torry Furnace, a minor interpretive site and cultural resource.

266. In section 8.8.2, the proposal crosses more than four trails on the GWNF. The correct reference is to Ramseys Draft Wilderness, not Ramsey's Draft Wilderness Area. The access to Ramseys Draft Wilderness from Braley Pond area is over-emphasized in the document.

267. In section 8.8.5, the one sentence description of the Appalachian National Scenic Trail should be reworded for accuracy and completeness.

268. In section 8.8.6, this section refers to the Great Eastern Trail and secondarily refers to the Shenandoah Mountain Trail. This is inaccurate as the GWJNF has not formally acknowledged or authorized the proposed Great Eastern Trail anywhere on the forest. Though a working goal, it is likely that some portions of the Shenandoah Mountain Trail (Forest Trail #447) may eventually be recognized as also being a part of the Great Eastern Trail, but that is not the case at this time.

269. In section 8.8.6, second paragraph, the statement that routine construction will involve closing trails, and also roads, to public use for several weeks to several months would significantly impact forest use. Please analyze the impacts of construction on forest use as requested in scoping comments.

270. In section 8.8.6, note the Forest Service Manual and Handbook management direction for recreation resources is in FSM 2300 – Recreation, Wilderness, and Related Resource Management, FSM 2710 – Special Use Authorizations, and FSM 2720 – Special Uses Administration; and in FSH 2309.18 – Trails Management Handbook, and FSH 2709.11 – Special Uses Handbook.

271. In section 8.8.6, describe how the proposed pipeline corridors will impact the physical setting of the MNF trails within the proposed pipeline corridors. Include the following items in the discussion:

a. location and design of the trail tread and trail corridor within the proposed pipeline corridors during and after construction;
b. short term and long term maintenance impact from the pipeline corridors; and
c. short term and long term visual impacts to the trail and trail corridors.

272. Describe how the proposed pipeline corridors will comply with FSM 2353.15 (National Quality Standards) for trails.

273. Identify and discuss the effects of the proposed project on the eleven trails that could be affected. Include the following in the discussion:

a. trail name and number, further identified by the affected segment(s), and illustrated on a map showing the locations relative to that of the proposed project;
b. description;
c. length;
d. location; and
e. description of trail uses (e.g., hiking, biking);

274. In section 8.8.9, on page 8-52, there is a discussion of OHV blocking measures, but no mention of ATV/UTV blocking measures. There are known problems with illegal OHV/ATV/UTV in the vicinity of mileposts 149.6 and 150.7 and in other locations on NFS lands. Expand the existing discussion to include OHV. Describe proposed measures to minimize increases of illegal OHV/ATV/UTV use on NFS lands due to increased access caused by the proposed pipeline corridor. Include descriptions and specifications for barriers, including locations, signage, and other proposed measures.

275. In section 8.8.11, identify Wild and Scenic Rivers or eligible rivers or river segments on the MNF and describe the location of each river or river segments as shown on a map relative to the location of the proposed project and the physical character description of each river or river segments.

276. The last paragraph on page 8-7 states that the proposed ACP would not cross any designated Scenic Areas in the MNF (MP 8.3). However, it would be near enough to the Gaudineer Scenic Area/National Natural Landmark that project effects would need to be evaluated.

277. In section 8.11.2.1, on page 8-71, the reference to the April 2008 Scenery Treatment Guide is outdated and should be changed to the Scenery Treatment Guide at Table 3-3 of the 2014 LRMP.

278. This section should add one or more paragraphs regarding the views from multiple recreation resources that could be impacted by the proposed pipeline (in addition to the one paragraph in the draft resource report regarding the Recommended Shenandoah Mountain Scenic Area). Scenery viewed from other recreation resources that could potentially be impacted (can confirm or refute after visual simulations are done) include the Wild Oak National Recreation Trail as well as Dowells Draft Trail and White Oak Draft Trail, both used to access the Wild Oak NRT, the Shenandoah Mountain Trail, and the Cowpasture River used by many for floating and angling.

279. On page 8-82 a list of mitigating treatments is provided specific to different SIOs. In addition to those listed, other mitigating measures might include the following:

- Undulate and feather the trees along the edges of the portion of the right-of-way that will be converted to herbaceous ground cover so that it is not a stripe with parallel lines running across the landscape.
- Where there is a SIO of High that cannot be achieved, consider leaving additional trees in the right-of-way to break up the open area.
- Crossing of forest roads and trails should be at right angles whenever possible.
- Structures and appurtenances should be set as far back from road and trail crossings as possible. They should be non-reflective and, if possible, treated or painted to blend with the natural environment.
- Part of the pipeline is proposed to be co-located with existing utility rights-of-way. This is typically encouraged and benefits the visual resources. However, there have been instances where expansion of an existing corridor was deemed to have greater impacts than providing a separate corridor in a different location. The potential impacts of both methods should be assessed to determine which would result in the least impacts to the scenic resources.
- To the extent possible, follow natural topographic lines to reduce the visual impact of structures, soil disturbance and vegetation removal.
- Consider an alignment that locates utilities behind landforms when otherwise visible from trails, roads used to access recreation and tourism destinations, recreation sites, etc.
- Avoid running over the top of a forested ridge at a right angle. The square notch that creates in the ridgeline is typically highly visible.

280. The final report should include a "seen area" analysis from the entire route through the GWNF. The seen area should include a distance of five miles from the proposed route of the pipeline. This should be used to determine additional locations of key observation points (KOPs) and to determine locations for preparation of photographic simulations.

281. In draft resource report 8, Appendix 8H, Table 8H contains several errors, inaccuracies, and omissions. All GWNF system trails should be listed both by name and by FT (Forest Trail) number. The GWNF from milepost 151.6 to 151.6 is not listed sequentially. Delete the Great Eastern Trail reference. The list should also include Forest Service roads, as these, in addition to trails, are also primary travelways for dispersed recreationists. Areas within 0.25 mile, include the following:

- Shaws Fork Recreation Area
- FT #112, Shaws Fork Trail
- FT #447, Shenandoah Mountain Trail
- Braley Pond Recreation Area
- FT #654, Braley Branch Trail
- FT #650 Dowells Draft Trail
- FR #449
- FR #466
- FR #466A
- FR #1755
- FR #1755A
- FR #1755B
- FR #1757

(All of the above are on the North River Ranger District of the GWJNF.)

- Mount Torry Furnace Interpretive Site
- FT #507, Torry Ridge Trail
- FT #1, Appalachian National Scenic Trail (if on GWNF and not NPS-BLRI at proposed crossing)

282. It is worth noting that there has been correspondence between the GWJNF and ACP about land ownership involving the Appalachian National Scenic Trail in other areas of the Glenwood-Pedlar Ranger Districts. There is one administratively-transferred tract of USDA-owned land south of Reeds Gap and north of Three Ridges Wilderness (NPS Tract 450-1).

283. Appendix 8K lists recreation areas, scenic byways, and special interest areas crossed by or within 0.25 mile of the proposed project. Site-specific impacts to these features should be analyzed and presented.

284. The list of roads in Appendix 8D is not useful because the roads on NFS lands are not identified and therefore the numbering system cannot be cross-referenced to Forest Service road numbers. Roads on NFS lands that do not have a system road number should be described as non-system roads.

285. ACP notes throughout section 10 that crossing NPS lands, such the Appalachian National Scenic Trail and the Shenandoah National Park, would require authorizations from the U.S. Congress which would be infeasible to obtain within the timeframe required by the purpose and need of the project. Because the authorization for a special use of NFS lands can be obtained within the timeframe required by the purpose and need of the project, ACP proposes routes that cross NFS lands rather than NPS lands. Because the environmental effects of route alternatives crossing NPS lands are not discussed in the resource reports, it appears as if ACP has not considered environmental effects in selecting route alternatives to remain in consideration.

286. Section 10.8.1.5, Appalachian Trail South Major Route Alternative, cites several resource related reasons, particularly in regards to the horizontal directional drill proposal, of why this alternative was adopted by ACP. However, the report should have a more in-depth discussion of the resource related rationale for why NPS administered Appalachian Trail lands were being avoided and not base all of the routing decisions for the Appalachian National Scenic Trail crossing on project timeline issues with getting Congressional approval. The proposed location for crossing the Appalachian National Scenic Trail need to be based on sound resource and compelling public interest determinations.

287. Please expand the visible geographic area of the map shown in Figure 10.6.1 to include the Mountain Valley Pipeline route.

288. Figure 10.8.1-2 is a map showing major routing constraints and existing corridors on both the MNF and GWNF, yet is titled only Monongahela. It is not referenced in section 10.8.1.3.

289. In this section and others, including in draft resource report 8, it appears that because the MNF is discussed before the GWNF, the MNF receives full and comprehensive review while the GWNF does not. Ensure the discussions are adequate for both forests.

290. In section 10.8.1.3, the first paragraph providing an overview of the GWNF is inadequate and erroneous. As examples, there is no GWNF land in Kentucky, the GWNF does not contain portions of the Blue Ridge Parkway, and the GWNF contains six Wildernesses (not eight). This paragraph should be rewritten to be accurate, comprehensive, and consistent with other descriptions of the Forest elsewhere in the proposal.

291. In 10.8.1.3, the reference to USFS 20114a is inaccurate.

292. In section 10.8.1.3, on page 10-74, it is stated that Congress must authorize a pipeline crossing of a Wilderness. Actually, it is the President who has that authority, and only "upon his determination that such use or uses in the specific area will better serve the interests of the United States and the people thereof than will its denial."

293. In section 10.8.1.3, GWNF 3 crosses the Appalachian National Scenic Trail on lands owned and administered by the GWNF. It is impossible to determine from the maps provided in draft resource report 1, Appendix 1A (page 41 of 153), or as Figure 10.8.1.9 on page 10-81, whether this is factual or not. A detailed field-based analysis, coupled with best current Appalachian National Scenic Trail centerline data is needed to determine whether or not the Appalachian National Scenic Trail in this location is on USA-owned lands managed and administered by the GWNF or on USA-owned lands managed and administered by the NPS-BLRI. The Appalachian Trail Conservancy is the best source for accurate trail centerline data for the Appalachian National Scenic Trail.

294. The fifth paragraph in section 10.8.1.3 states that ACP identified GWNF 3 as the preferred alternative. The map on page 10-73 does not incorporate the Appalachian Trail South Major Route Alternative in to GWNF 3. This is misleading as the stated preferred route changes in this vicinity to avoid crossing the Appalachian National Scenic Trail where it is located on NPS lands.

295. The last paragraph on page 10-82 gives the reasons that the Appalachian National Scenic Trail South route is the preferred alternative, but doesn't highlight the real reason that it was selected – avoiding crossing the Appalachian National Scenic Trail on NPS lands. This needs to be highlighted as the primary reason it was selected. There should be an alternative that incorporates the baseline route crossing of the Appalachian National Scenic Trail and Blue Ridge Parkway, along with the other reasons stated in the last paragraph, such as crossing fewer perennial waterbodies. It should also be noted that any potential crossing of the Appalachian National Scenic Trail and Blue Ridge Parkway would incorporate the use of a single horizontal directional drill.

296. The first paragraph in section 10.8.1.5 describing the Appalachian National Scenic Trail is perfunctory, inaccurate and inadequate. It needs to be rewritten and reviewed. The Appalachian National Scenic Trail was not built in 1921; it was conceived as an idea. It was first completed in 1937. It became a National Scenic Trail in 1968. It is managed, using the Appalachian National Scenic Trail Cooperative Management System, by multiple partners, with NPS as the lead federal agency.

297. The first paragraph on page 10-45 states that crossing the Appalachian National Scenic Trail on NPS lands requires an authorization from the U.S. Congress and that the authorization would be infeasible to obtain within the timeframe required by the purpose and need of the Projects. A thorough analysis needs to be conducted to identify a preferred crossing that reduces visual and noise impacts to the Trail, regardless of land ownership. Timeframes should not be a factor in identifying a preferred route; avoidance and minimization of visual and noise impacts and environmental impacts should be the major factor in identifying a preferred route. Partners needed to identify the location of such a crossing include the Appalachian Trail Conservancy (ATC), NPS, Appalachian Trail Park Office, U.S. Forest Service, and ATC-affiliated local Appalachian National Scenic Trail Clubs.

298. Figure 10.4.2-1 is provided to show that "the average annual wind speed at a height of 80 meters onshore for West Virginia, Virginia, and North Carolina is generally well below the 6.5 meters per second average wind speed. Therefore, the majority of land in West Virginia, Virginia, and North Carolina, is not suitable for commercial wind development using currently available technology." A more detailed review of the graphic indicates that the wind speed values along the preferred corridor (MNF 2) have much higher wind speed values than the surrounding landscape, and has already been shown to be commercially viable for wind power development.

299. For system alternatives and conceptual collocation route alternatives, provide a desktop comparison of available environmental impact data to support the statements that environmental impacts would be equal to or greater than the impacts of the proposed route. Simple measurements of mileage and acreage do not necessarily equate to impacts on specific resources of interest. Such measurements fail to account for the uniquely sensitive environmental resources that would be impacted by the proposed ACP, which would cross the wildland core of the central Appalachians. The Forest Service requested this information, particularly discussions of environmental analysis, in scoping comments.

300. The final paragraph in the "MNF Route Selection" indicates that the applicant intends to evaluate only the MNF2 and MNF5 alternatives. ACP states on page 10-70 that it is impossible to collocate with the Columbia project due to topography and sensitive management areas, and ACP further states any route north and east of the proposed route is impossible because any route heading north and east would eventually have to cross the Shenandoah National Park due to the infeasibility of acquiring authorization from the U.S. Congress in a manner considered timely for the project. Therefore, ACP identified reasons relating to the project schedule, but not environmental reasons for dismissing alternatives. The Forest Service has repeatedly asked ACP to disclose the environmental characteristics of the route alternatives and to identify the environmental reasons for rejecting the routes. The Forest Service made these requests during meetings (7/2/14, 7/23/14, 9/17/14, 9/24/14, 6/5/15, 6/30/15, 7/7/15) and in scoping comments.

301. The first paragraph on page 10-23 incorrectly states that the Columbia pipeline crosses the Laurel Fork North Wilderness Area. The Columbia pipeline is adjacent to the Laurel Fork North Wilderness Area, but does not cross it. This paragraph, and the second paragraph in section 10.8.1.2 state that the Columbia pipeline is located within the vicinity of the Otter Creek, Roaring Plains, and Dolly Sods Wilderness Areas. However, these areas are not located close enough to the Columbia pipeline to be relevant to the discussion.

302. The discussion of the Columbia collocation alternative mentions the need to clear additional right-of-way for a parallel line. Please also discuss the reduced fragmentation that would result relative to clearing in an entirely new corridor.

303. The discussion of the Columbia collocation alternative mentions the option of a new greenfield line located far enough north to avoid all Wilderness and National Recreation Area constraints on the MNF. Investigate and address the feasibility of this option, along with the environmental impacts relative to the proposed and alternative routes for the ACP Project.

304. Evaluate the potential to increase the capacity of the Columbia system by replacing existing pipe, or through other means that would eliminate or minimize the need for looping or other expansion of the existing right-of-way. The Forest Service made this request in scoping comments.

305. The discussion of conceptual collocation route alternatives in section 10.7 emphasizes the increased overall footprint of disturbance due to the longer routes and the need to expand the collocated right-of-way. However, the discussion excludes the potential for the collocated lines to share workspace, which, if feasible, could reduce the impact footprint. Also, the discussion fails to include whether collocation would reduce forest fragmentation impacts. Please discuss the potential for sharing workspace, and compare forest fragmentation impacts of the various co-location alternatives with the proposed and alternative routes for the ACP Project.

306. The third paragraph on page 10-52 lists eight constraints that were considered in developing route alternatives. In addition to the listed constraints, consider all NFS resources in this section. At a minimum, these would include all resource and environmental concerns identified in scoping comments and meetings with ACP.

307. In the first paragraph of section 10.8.1.2, add delivery of high-quality water to the list of uses for which the MNF is managed.

308. The second paragraph of section 10.8.1.2 states that it is infeasible to avoid crossing the MNF. The Forest Service asserts that a more thorough analysis to demonstrate the infeasibility of the various system and collocation alternatives, particularly the MVP alternative and the Hastings to Dooms route, should be conducted before determining avoidance of NFS lands is infeasible.

309. The second paragraph of section 10.8.1.2 includes areas managed for "spruce and spruce-hardwood development" in the list of "less sensitive" areas. These areas are more properly described as "spruce and spruce-hardwood ecosystem restoration" areas, and they should not be described as "less sensitive."

310. The first paragraph of "Northern and Eastern Route Alternatives" in 10.8.1.2 dismisses collocation with the Columbia line as infeasible. The Forest Service has requested in scoping comments and in meetings that ACP consider the potential for expanding the capacity of the Columbia line through replacement of existing pipe or other means.

311. The third paragraph of "Northern and Eastern Route Alternatives" in section 10.8.1.2 mentions Shenandoah National Park as a major constraint. Please evaluate a combination with new construction that would avoid Shenandoah National Park.

312. The first paragraph of "MNF Baseline Route and Alternatives" incorrectly states that MNF2 avoids sensitive habitats. As noted in our scoping comments, MNF2 would cross habitat for the Virginia northern flying squirrel (also known as the West Virginia northern flying squirrel), Cheat Mountain salamander, Cheat minnow, Appalachian darter, candy darter, New River shiner, eastern hellbender, elktoe, green floater, brook trout, and several sensitive plant species, as well as red spruce ecosystem restoration areas. Ongoing field surveys could identify additional sensitive habitats along MNF2. Please remove the incorrect statement.

313. The fourth paragraph of "MNF Baseline Route and Alternatives" states that MNF2 follows an "abandoned strip mine." The strip mines in this area were reclaimed according to federal standards (i.e., the strip mines were not abandoned), and a collaborative group known as the Central Appalachian Spruce Restoration Initiative (CASRI 2015) is in the process of restoring the native red spruce ecosystem on these old mines. So far, partners of the Central Appalachian Spruce Restoration Initiative have invested over $1 million into the restoration of this landscape. The Forest Service discussed these restoration efforts in scoping comments and in meetings throughout the pre-filing activities. Please describe these restoration areas appropriately.

314. Clarify if the mileage of routes in Table 10.8.1-2 includes access roads proposed for each route.

315. Table 10.8.1-2 should include the northern long-eared bat and Forest Service sensitive and management indicator species.

316. The first and second paragraphs on page 10-61 describe the MNF2 route through the spruce restoration areas on the old strip mine as a "major optimization." As noted in this document, meetings with ACP, and scoping comments, this area is restoration area and the Forest Service does not consider a route through recently restored areas to be a major optimization. The final resource reports should address the effects of the proposed route on the restoration area.

317. The last paragraph on page 10-61 refers to ecosystem restoration areas as "abandoned strip mines" and states that this is an optimization of the route because these areas do not appear to provide suitable habitat for the northern flying squirrel. However, one of the major reasons for restoring these areas is to provide potential future habitat for the northern flying squirrel. Routing a pipeline through this area would thwart that purpose. The final resource reports should discuss potential effects of the proposed project to future northern flying squirrel habitat.

318. Although the area adjacent to Highway 250 is located between two existing linear corridors, it likely still provides suitable habitat for the northern flying squirrel. Many captures have occurred near the proposed route in this area.

319. The last paragraph on page 10-61 incorrectly implies that areas below 4,000 (or 3,000) feet elevation, on south-facing slopes, and/or with little red spruce are unsuitable or less suitable for northern flying squirrels. While elevation and aspect are among the many environmental factors that may affect the floral and faunal composition of red spruce-northern hardwood ecosystems, these factors by themselves do not render habitat unsuitable or less suitable for northern flying squirrels. The vast majority of northern flying squirrel captures on the MNF occurred below 4,000 feet, and many individuals have been captured below 3,000 feet. In addition, many captures within the larger spruce landscape matrix have occurred in micro-sites that are currently dominated by northern hardwoods. Drainages, particularly with a strong hemlock component, also provide suitable habitat. Please correct the wording in the final resource reports to reflect the correct information.

320. The MNF2 study corridor crosses areas of potential northern flying squirrel habitat and areas where occurrences are known. It is unlikely that MNF2 could avoid impacting substantial areas of suitable habitat. As noted in scoping comments, such impacts are inconsistent with the Forest Plan. This protection afforded to the northern flying squirrel by the Forest Plan was the primary justification for de-listing the species. The discussion of northern flying squirrels in the final resource reports should include these points.

321. The section Habitat for Cheat Mountain Salamander on page 10-62 states that MNF2 avoids mapped habitat areas on Cheat Mountain. Many areas within the proposed MNF2 corridor on Cheat-Back Allegheny Mountain have been modeled as potential habitat for Cheat Mountain salamander and undiscovered populations could occur in those areas. As of the date of this writing, one previously undiscovered population has been discovered in the survey corridor for MNF2. As noted in scoping comments, the Forest Plan requires avoidance of disturbance within 300 feet of occupied habitat unless analysis can show that activities would not adversely affect populations or habitat.

322. The discussion of Blister Run Swamp Botanical Area on page 10-62 should acknowledge that the MNF 2 route lies within the drainage basin of the wetland. Please discuss potential impacts related to water quality, sedimentation, changes in hydrology, introduction of invasive species, and further fragmentation of the landscape.

323. In the section Lambert Spruce Restoration Area, please clarify that the restoration area is in the area described as "cleared abandoned strip mines." The fact that MNF2 would run through these restored mine areas would increase the impact to the restoration area, rather than decrease the impact, as is currently implied. Also, please clarify how these areas would be restored to achieve "no net loss" while simultaneously maintaining a cleared 75-foot-wide right-of-way.

324. The section, Potential Wild and Scenic Rivers, states that impacts to the eligible Shaver's Fork River would be mitigated through best management practices and right-of-way restoration. This statement does not address the outstandingly remarkable values which render the river eligible for Wild and Scenic River status. Please include this information, as requested previously in scoping comments.

325. The Red Spruce Cover section notes that MNF2 crosses mostly areas of low or now spruce cover. Although these areas currently contain little mature spruce, they do retain the site characteristics to support spruce. Therefore, such areas could be high priority restoration sites in the future. This section needs to disclose the impacts to potential future restoration areas. Additionally, please correct the reference to the "abandoned strip mine." Somewhere in or near this section, the report needs to acknowledge that MNF2 crosses substantial areas of MP 4.1, and that the impacts associated with MNF2 would be inconsistent with the management emphasis of that MP.

326. As noted in scoping comments, the alternatives analysis should address geologic hazards and sensitivities with respect to slippage potential, weathering rates, acidity of geologic materials, and slope stability of the geologies that the route crosses. For example, it is known that certain geologies such as the Mauch Chunk formation have a severe risk for slippage and land slide or mass movement activity. The Pottsville sandstone has a severe risk for acidification effects and minimal nutrients.

327. The last paragraph in the section "MNF Baseline Route and Alternatives" (near the top of p. 10-63) states that MNF2 has the potential to avoid or minimize impacts to sensitive resources within the MNF. In light of all the serious issues that have been raised regarding the impacts of MNF2, this statement needs to be removed.

328. The three southern route alternatives (MNF3, 4, and 5) all appear to converge on the same path at a point just south of Thorny Flat. As requested in our scoping comments, please consider potential combinations of these alternatives, rather than evaluating them in isolation. For example, based on Figure 10.8.1-4, it appears that the western end of MNF4 would cross less steep ground than the western end of MNF5. Combining the western end of MNF4 with the eastern end of MNF5 could help reduce steep slope issues, while still avoiding potential wilderness areas on the GWJNF. Could such combinations of these routes also have the potential to address the lack of access issue, given that MNF4 has greater road access than MNF5?

329. The MNF5 route would cross a small section of the MNF that is allocated to MP 6.2 (remote backcountry). New pipeline construction would be inconsistent with Forest Plan direction for this MP. The final resource reports should include a route variation avoiding this area.

330. The "Southern Route Alternatives" section includes an extensive discussion of the construction difficulties posed by these routes due to steep slopes. Throughout this section, comparisons are made to the corresponding segment of MNF2. While the southern routes traverse more areas of steep slope than MNF2 within this corresponding segment, the MNF2 route also contains many areas of steep slope, as does the entire proposed ACP route within West Virginia and the mountainous portions of Virginia. The analysis needs to address the steep slope issue throughout the entirety of all routes. All qualitative and quantitative comparisons among alternatives need to cover the entire route, not just the segment where the southern routes deviate from MNF2. In particular, a table such as 10.8.1-3 needs to be produced for the entirety of all routes. In addition, as was pointed out in our scoping comments, the MNF Forest Plan prohibits operation of mechanized equipment on slopes greater than 40-50% unless mitigation measures can be devised to maintain soil stability. Revise the final resource report to address this.

331. The last paragraph on page 10-64 addresses lack of access to the southern routes, but this analysis appears to only consider public roads. Please consider the use of private roads in this analysis also. In addition, comparisons of accessibility among routes should be made for the all routes in their entirety, rather than just for the segments where the southern routes deviate from MNF2. Access impacts should be discussed for roads that need to be upgraded or reconstructed, in addition to the impacts of constructing new roads. Finally, evaluate the potential for a combination of MNF4 and MNF5 to ease the access constraints, since MNF4 has a similar

332. The discussion of the southern route alternatives implies that those routes would have greater environmental impact than MNF2 because the routes are longer. As noted previously, and as stated in the Forest Service's scoping comments, routes should be compared by environmental effects rather than length. The southern route alternatives would result in substantially less impact to many of the sensitive resources on the MNF (e.g., spruce forest and spruce restoration areas, northern flying squirrel habitat, Cheat Mountain salamander habitat, perennial waterbodies, trails, and Civil War battlefields). The final resource reports should include a comparison of alternatives based on environmental effects particularly effects to sensitive resources.

333. The paragraph at the top of page 10-62 states that MNF3, 4, and 5 cross the Quiet Zone for the National Radio Astronomy Observatory. It should be noted that the entirety of all MNF routes would be contained within the Quiet Zone (NRAO 2015).

334. Beginning at the bottom of page 10-66, the report discusses a potential "southern alternative corridor." This alternative is dismissed due to management area constraints within the GWJNF. Based on review of Figure 10.8.1-2, adjustments could be made to avoid the management area constraints and sensitive resources on Shenandoah Mountain in the GWNF. Please evaluate this alternative with the aforementioned adjustments in effort of avoiding and minimizing project effects on sensitive resources.

335. The second paragraph of the "MNF Route Selection" section states that MNF1 and 2 optimize the baseline route. The paragraph further states that "…MNF2 appears to result in the least environmental impact by following existing cleared corridors through potential habitat for protected species, or by avoiding these habitat areas entirely." The Forest Service disagrees with the aforementioned statements, as shown by scoping comments and as discussed in meetings throughout the pre-filing process.

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