

401 BLOCK 10 - ANTIDegradation EVALUATION

For the purposes of this Antidegradation Evaluation, the following alternatives were assessed: the Preferred Alternative, the Minimal Degradation Alternative, and the Non-Degradation Alternative. The **Minimal Degradation Alternative** is the current (selected) build alternative for the PIK-104-10.64 project and the alternative for which design plans have been prepared. The **Preferred Alternative** is the same as the Minimal Degradation (Selected) Alternative *with the following exception*: 3:1 slopes in roller compacted concrete construction areas in lieu of the proposed 2:1 slopes. The **Non-Degradation Alternative** is the No-Build (no action) Alternative.

Determination of Preferred Alternative and Minimal Degradation Alternative

A general discussion of design alternatives/concepts and avoidance and minimization measures that have been considered for the PIK-104-10.64 project is presented in attached 404 Block 23 (Avoidance, Minimization, and Compensation). Included in this discussion is background information on the recent history of the project and several constraints/design requirements related to the project Purpose and Need (see also 404 Block 18/401 Block 8a) that were considered/addressed when developing and evaluating alternatives for this project. In summary: 1) substandard conditions on SR 104 must be addressed by the rehabilitation project, 2) the dam must be rehabilitated in conjunction with the SR 104 improvements without compromising the structural integrity of the dam, 3) current dam/spillway hydraulics must not be altered, 4) a secondary lake drain system must be included in the project, and 5) existing and planned recreational uses must be considered.

Infrastructure projects that use federal funds must document alternatives development, impact avoidance and minimization, and Selected Alternative decision-making in accordance with the National Environmental Policy Act (NEPA) process. Since ODOT is the lead agency on the PIK-104-10.64 project, the project has been developed using ODOT's Project Development Process (PDP) which addresses the requirements of NEPA, as well as the goals of the NEPA/404 merger, which is a practice that was initiated in the 1980's and formalized in the 1990's under the Intermodal Transportation Efficiency Act (ISTEA) to streamline project decision-making on Federal-aid projects involving evaluation of alternatives, assessment of impacts to resources, and balancing resource impacts and project needs.

ODOT and ODNR evaluated project alternatives and identified the Selected Alternative for the PIK-104-10.64 project by following the ODOT PDP (NEPA/404 merger) process. The proposed project was initiated with an understanding of the previous rehabilitation work completed in the project area and a thorough assessment of existing conditions and project needs. Constraints and design parameters were established in conjunction with the identification of environmental features in the project area, transportation and dam safety, property and land use interests, construction costs, and future maintenance considerations. Ecological resources and anticipated impacts were documented and coordinated with USACE, Ohio EPA, USFWS, and ODNR and review comments were evaluated. A Selected Alternative was then identified that balanced project need elements, environmental impacts, feasible avoidance and minimization techniques, and cost considerations. Documentation of this process, in accordance with NEPA, was completed via a Level 2 Categorical Exclusion, which will be finalized/approved in 2014.

The ODOT PDP (NEPA/404 merger) process under which this project was developed has clearly established that: 1) there are numerous sensitive environmental resources within and surrounding the project area, 2) the Purpose and Need of the project is well-defined and involves a combination of transportation and dam safety issues with significant human health and safety implications, and 3) construction costs are substantial. With regard to these three considerations, there are very few design alternatives and avoidance/minimization options that can be feasibly or reasonably considered under the Preferred Alternative/Minimal Degradation alternative framework. Consequently, establishing a "Preferred Alternative" and "Minimal Degradation Alternative" for this 401 Antidegradation Evaluation utilizes assessments and streamlined decision-making that occurred under the ODOT PDP (NEPA/404 merger) process with the specific intent to balance a wide range of environmental impacts, land use/property interests, and project needs, without compromising human health and

safety and without incurring exorbitant costs. The following table summarizes the proposed Preferred and Minimal Degradation alternatives for the PIK-104-10.64, along with alternatives that have been determined to be not feasible and therefore are not included as part of the Antidegradation Evaluation.

Summary of Preferred Alternative and Minimal Degradation Alternative Determination

Design Alternative/Component (affecting water resources)	Conclusion	Discussion
3:1 Slope - Roller Compacted Concrete (RCC)	Preferred Alternative	This was the original RCC slope recommendation from the previous (2005-2006) rehabilitation work. Preferred for long-term rehabilitation of the dam. Matches existing 3:1 slope. Overall safest design to construct and maintain.
2:1 Slope - Roller Compacted Concrete (RCC)	Minimal Degradation Alternative	Adequate for long-term rehabilitation of the dam. Reduces wetland and stream impacts (compared to 3:1 slope) and minimizes right-of-way impacts and costs. Safe to construct and maintain.
Lake White Boat Ramp Extension	Preferred and Minimal Degradation Alternative	Included for 4(f) mitigation (Lake White State Park impacts). Minor impact to Lake White expected due construction of a small temporary cofferdam and permanent concrete slab. Minimal opportunity for further avoidance/minimization of impacts to Lake White
Lake White Rock Channel Protection (RCP)	Preferred and Minimal Degradation Alternative	Required in Lake White along SR 551 and SR 104 to protect the top of the dam from scour/erosion. Generally matches the existing 2:1 slope on the lake side of the dam. Basic RCP armament with minimal opportunity for further avoidance/minimization of impacts to Lake White.
Siphon Lake Drain	Preferred and Minimal Degradation Alternative	Required to provide a way to drain the lake to an elevation low enough to perform future dam/spillway maintenance (routine or emergency). Outlet structure previously constructed. Minimal opportunity for further avoidance/minimization of impacts to Lake White (see Gravity Drain below).
Concrete Retaining Wall (Sta. 197 to Sta. 201)	Preferred and Minimal Degradation Alternative	Designed to a specific length and height (in conjunction with the proposed four-span spillway bridge) such that overall dam/spillway hydraulics are not altered. Avoids/minimizes impacts to Wetlands 4, 5, and 5a and a jurisdictional pond and protects existing Aqua Ohio pump station from floods that overtop SR 104. Further extension of this wall to avoid other water resource impacts is not possible (due to dam/spillway hydraulic implications).
Four-Span Spillway Bridge	Preferred and Minimal Degradation Alternative	Required to address existing deteriorated bridge condition. No impact to Lake White; minimal impact to existing concrete spillway (Pee Pee Creek). Does not restrict PMF flow through spillway. Dam/spillway hydraulics not altered.
New Bridge Wingwalls and Rock Channel Protection (RCP)	Preferred and Minimal Degradation Alternative	Required to support new four-span spillway bridge without altering existing spillway hydraulics. Footer design minimizes impacts on Pee Pee Creek, Crooked Creek, and Wetland 6. Proposed RCP is minimum necessary to protect wingwall footers from scour. Contractor construction access will be limited to the area directly below the spillway to minimize temporary construction impacts to Pee Pee Creek and Wetlands 6, 7, and 8. Minimal opportunity for further avoidance/minimization of impacts.
ODNR Access Drive	Preferred and Minimal Degradation Alternative	Included to provide access to ODNR property and accommodate ODNR plan for Pee Pee Creek/Scioto River public access. Location of access road controlled by relocated CR 105/SR 104 intersection (safety/adequate intersection spacing). No opportunity to avoid/minimize impacts on Wetland 10 and Crooked Creek.
Crooked Creek Relocation	Preferred and Minimal Degradation Alternative	Crooked Creek is currently scouring the toe of the SR 104/Lake White Dam embankment. Proposed RCC north of the spillway and the ODNR Access Drive require a substantial relocation of Crooked Creek. The proposed relocation will be conducted using natural channel design techniques and will restore approximately 1,070 feet of Crooked Creek to a higher long-term ecological level than the current channel segment being abandoned (filled). The relocated channel segment will also better connect to the surrounding floodplain and will have minimal impact on Wetland 8 during construction. The proposed relocation alignment will also aid in temporarily dewatering the project area below and north of the spillway for construction work. Hydraulic studies and field observations indicate the relocation of Crooked Creek will not have a substantive impact on Pee Pee Creek and Wetlands 6 and 7 below the spillway and will likely benefit Wetland 8 (improved hydrology connection). Furthermore, since Pee Pee Creek is highly eroded downstream of the spillway, removal of Crooked Creek flood flows from eroded Pee Pee Creek channel will have some ecological/water quality benefit to Pee Pee Creek (reduced shear stress, scour, erosion).

Summary of Preferred Alternative and Minimal Degradation Alternative Determination

Design Alternative/Component (affecting water resources)	Conclusion	Discussion
Lake White Gravity Lake Drain	No Water Resources Impact Benefit	No substantive operational, impact, or cost benefit over the proposed Siphon Lake Drain (see above). No opportunity for further minimization of impacts to Lake White.
Additional Retaining Walls (instead of RCC)	Not Feasible	Instead of RCC, constructing additional retaining walls along the top of the dam to reduce the project impact footprint (similar to the proposed retaining wall at Sta. 197 to Sta. 201) would adversely affect dam/spillway hydraulics (block floodwaters overtopping SR 104, increasing lake levels during flood events).
Tie-Back Walls (instead of RCC)	Not Feasible	Instead of RCC, constructing tie-back walls along the toe of the dam to reduce the project impact footprint would require a level of excavation that would compromise the structural integrity of the dam.
Rock Channel Protection (instead of RCC)	Higher Water Resource Impacts	Using rock channel protection to armor the dam embankment would require wider 4:1 slopes (increasing the project impact footprint) and would require high-cost concrete grouting.
Articulating Block Mat System (instead of RCC)	Not Feasible	Pre-fabricated mats comprised of concrete blocks are not allowed on Class 1 dams.
Steeper Slopes - RCC	Not Feasible	RCC constructed on steeper slopes (1.5:1 or 1:1 would require substantial excavation that would compromise the structural integrity of the dam.
Single-Span or Two-Span Spillway Bridge	Not Feasible	The depth of the steel girders for these bridge designs restricts PMF flow (increasing lake levels during flood events).
Other Crooked Creek Relocation Alignments	Not Feasible	A shorter relocation of Crooked Creek along the toe of the ODNR Access Drive and the proposed RCC is not feasible due to the potential for future embankment scour and erosion, is not compatible with ODNR access plans for the property, and would impact Wetlands 7 and 8 below the spillway. Furthermore, the ability to implement natural channel design would be significantly reduced. A channel relocation along the toe of the RCC slope would also create difficult construction conditions for the contractor when building the RCC and the ODNR Access Drive and would likely result in prolonged temporary construction impacts. Other relocation alignment options between a "toe of slope" alignment and the proposed relocation alignment have minimal benefit due to increased impacts on Wetland 8.

From this point forward, the Minimal Degradation Alternative (which is the Selected Alternative for the PIK-104-10.64 project) will be discussed first in each section.

Block 10a.

Provide a description of any construction work, fill or other structures to occur or be placed in or near the surface water. Identify all substances to be discharged, including the cubic yardage of dredged or fill material to be discharged to the surface water. (OAC 3745-1-05(B)(2)(b)).

1. Minimal Degradation Alternative (Selected Alternative)

The PIK-104-10.64 project will impact nine (9) jurisdictional "waters of the United States", including two streams, six non-isolated wetlands, and one lake (see Exhibits 3 through 12). Crooked Creek and Pee Pee Creek are the two streams that will be impacted by the project. Crooked Creek is a tributary to Pee Pee Creek, and Pee Pee Creek is a tributary to the Scioto River. The six impacted wetlands (Wetlands 1, 4, 6, 8, 9, and 10) ultimately drain into Crooked Creek or Pee Pee Creek downstream of (below) the Lake White Dam/spillway. Lake White is an artificial impoundment that was created when the Lake White Dam was constructed across the Pee Pee Creek channel. Physical and biological characteristics for impacted jurisdictional waters are presented in attached Table A (streams), Table B1 (wetlands), and Table B2 (Lake White), and on Exhibits 3 through 12. Photographs of the nine impacted features are presented in Appendix C. A discussion of proposed fill activities in each feature is presented in 404 Block 18 and 401 Block 8a, and a summary of impacts is presented in the table below.

Summary of Minimal Degradation Alternative (Selected Alternative) Impacts

Feature	Impact Description	Total Length Impacted*	Total New Length Impacted*	Total Area Impacted*	Fill Volume*
Pee Pee Creek	Permanent Concrete, RCP, Earthen, Steel, and Granular Fill for Bridge Abutment/Pier Removal and Reconstruction, New Wingwall Construction, and Roller Compacted Concrete Construction; Permanent Earthen Fill/Embankment Grading for Relocation of Crooked Creek; Temporary RCP Fill and Equipment Access/Operation	327 ft	225 ft	0.478 ac	1,790 cy
Crooked Creek	Permanent Concrete, RCP, Earthen, and Granular Fill for Relocation of Crooked Creek, Bridge Wingwall, Roller Compacted Concrete, and ODNR Access Drive Construction; Temporary RCP Fill and Equipment Access/Operation	1,115 ft	1,115 ft	1.524 ac	8,436 cy
TOTAL STREAMS		1,442 ft	1,340 ft	2.002 ac	10,226 cy
Wetland 1	Permanent RCP and Granular Fill Placement for Roller Compacted Concrete Construction; Tree/Vegetation Removal and Equipment Access	NA	NA	0.024 ac	4 cy
Wetland 4	Permanent RCP, Earthen, and Granular Fill Placement for Roller Compacted Concrete Construction; Shrub/Vegetation Removal and Equipment Access	NA	NA	0.038 ac	31 cy
Wetland 6	Permanent Concrete, RCP, Earthen, and Granular Fill Placement for Roller Compacted Concrete and Wingwall Construction; Shrub/Vegetation Removal and Equipment Access	NA	NA	0.140 ac	195 cy
Wetland 7	No Impact	NA	NA	NA	NA
Wetland 8	Minor Earthen Fill/Grading for Relocation of Crooked Creek; Tree/Vegetation Removal and Equipment Access	NA	NA	0.042 ac	9 cy
Wetland 9	Permanent (Indirect) Loss of Hydrology Due to Relocation of Crooked Creek	NA	NA	0.090 ac	0 cy
Wetland 10	Permanent Earthen Fill Placement for ODNR Access Drive Construction	NA	NA	0.040 ac	65 cy
TOTAL WETLANDS		NA	NA	0.374 ac	304 cy
Lake White	Permanent Concrete and Granular Fill and Temporary Steel Cofferdam for Boat Ramp Extension; Permanent RCP and Granular Fill for Lake White Dam Embankment; Permanent Concrete, RCP, Steel, and Granular Fill and Temporary Steel Cofferdam for Siphon Lake Drain Construction; Temporary Equipment Access/Operation	NA	NA	2.703 ac	11,188 cy
TOTAL LAKE WHITE		NA	NA	2.703 ac	11,188 cy

* Includes Permanent and Temporary Impacts.

2. Preferred Alternative

As described on Pages 23-25, the Preferred Alternative involves the same overall design as the Minimal Degradation (Selected) Alternative, with one exception: 3:1 roller compacted concrete (RCC) slopes compared to the Minimal Degradation Alternative's 2:1 slopes. As illustrated in Appendix D, the 3:1 slope for the Preferred Alternative extends the impact zone an additional 30 feet (approximately), resulting in increased impacts to Wetland 1, Wetland 4, Wetland 6, and Pee Pee Creek, as well as a new impact on Wetland 7. A summary of Preferred Alternative impacts to jurisdictional waters is presented below.

Summary of Preferred Alternative Impacts

Feature	Impact Description	Total Length Impacted*	Total New Length Impacted*	Total Area Impacted*	Fill Volume*
Pee Pee Creek	Permanent Concrete, RCP, Earthen, Steel, and Granular Fill for Bridge Abutment/Pier Removal and Reconstruction, New Wingwall Construction, and Roller Compacted Concrete Construction; Permanent Earthen Fill/Embankment Grading for Relocation of Crooked Creek; Temporary RCP Fill and Equipment Access/Operation	357 ft**	255 ft**	0.613 ac**	1,937 cy**
Crooked Creek	Permanent Concrete, RCP, Earthen, and Granular Fill for Relocation of Crooked Creek, Bridge Wingwall, Roller Compacted Concrete, and ODNR Access Drive Construction; Temporary RCP Fill and Equipment Access/Operation	1,115 ft	1,115 ft	1.524 ac	8,436 cy
TOTAL STREAMS		1,472 ft	1,370 ft	2.137 ac	10,373 cy
Wetland 1	Permanent RCP and Granular Fill Placement for Roller Compacted Concrete Construction; Tree/Vegetation Removal and Equipment Access	NA	NA	0.277 ac**	323 cy**
Wetland 4	Permanent RCP, Earthen, and Granular Fill Placement for Roller Compacted Concrete Construction; Shrub/Vegetation Removal and Equipment Access	NA	NA	0.054 ac**	52 cy**
Wetland 6	Permanent Concrete, RCP, Earthen, and Granular Fill Placement for Roller Compacted Concrete and Wingwall Construction; Shrub/Vegetation Removal and Equipment Access	NA	NA	0.178 ac**	261 cy**
Wetland 7	Shrub/Vegetation Removal and Equipment Access; Temporary RCP Fill	NA	NA	0.009 ac**	14 cy**
Wetland 8	Minor Earthen Fill/Grading for Relocation of Crooked Creek; Tree/Vegetation Removal and Equipment Access	NA	NA	0.042 ac	9 cy
Wetland 9	Permanent (Indirect) Loss of Hydrology Due to Relocation of Crooked Creek	NA	NA	0.090 ac	0 cy
Wetland 10	Permanent Earthen Fill Placement for ODNR Access Drive Construction	NA	NA	0.040 ac	65 cy
TOTAL WETLANDS		NA	NA	0.690 ac	724 cy
Lake White	Permanent Concrete and Granular Fill and Temporary Steel Cofferdam for Boat Ramp Extension; Permanent RCP and Granular Fill for Lake White Dam Embankment; Permanent Concrete, RCP, Steel, and Granular Fill and Temporary Steel Cofferdam for Siphon Lake Drain Construction; Temporary Equipment Access/Operation	NA	NA	2.703 ac	11,188 cy
TOTAL LAKE WHITE		NA	NA	2.703 ac	11,188 cy

* Includes Permanent and Temporary Impacts.

** Impacts different (greater) than the Minimal Degradation (Selected) Alternative.

3. Non-Degradation Alternative

The Non-Degradation (No Build) Alternative involves no improvements to existing SR 104, Lake White Dam, or the SR 104 bridge over the Lake White Dam spillway. This alternative would have no immediate impact on Lake White, Pee Pee Creek, Crooked Creek, wetlands, ponds, terrestrial habitats, threatened and endangered species, or any other project area environmental resources, and would cause no near-term water quality degradation. However, the Non-Degradation Alternative would not address any of the critical Purpose and Need elements described in Block 8a (dam safety, spillway bridge deterioration, SR 104 improvement needs). Implementation of the Non-Degradation Alternative would result in gradual infrastructure deterioration and further dam and transportation safety problems, which would be exacerbated by future flood events and higher traffic volumes. This could potentially result in a catastrophic dam failure which would cause extensive downstream flooding and likely result in the loss of human life. Deteriorating road and bridge conditions and higher traffic volumes would also result in a greater potential for accidents in the Lake White Dam area, including spills of fuels or other hazardous materials which could eventually reach project area surface waters, groundwater, and terrestrial habitats. Consequently, under the Non-Degradation Alternative scenario, impacts to streams, wetlands, and

Lake White would be expected in the future due to the continual need for roadway and dam maintenance projects, along with occasional larger-scale emergency projects, in an effort to keep SR 104 open to traffic and avoid a critical dam failure. The monetary cost of these future maintenance projects and the associated environmental impacts/mitigation would eventually exceed those of the Minimal Degradation (Selected) Alternative, and would likely result in social and economic impacts due to road closures/traffic detours, loss of access to the Lake White State Park area, and an overall decline in attractiveness from a recreation/tourism standpoint. For these reasons, the Non-Degradation Alternative is not considered to be a safe or practicable alternative for the PIK-104-10.64 project, even though near-term water resource/water quality impacts and other environmental impacts associated with this alternative would be minimal. Further discussion of the Non-Degradation Alternative is presented at the end of Blocks 10b, 10c, and 10f -10k.

Block 10b.

Describe the magnitude of the proposed lowering of water quality. Include the anticipated impact of the proposed lowering of water quality on aquatic life and wildlife, including threatened and endangered species (include written comments from Ohio Department of Natural Resources and U.S. Fish and Wildlife Service), important commercial or recreational sport fish species, other individual species, and the overall aquatic community structure and function. Include a Corps of Engineers approved wetland delineation. (OAC 3745-1-05(C)(6)(a, b) and OAC 3754-1-54)).

1. Minimal Degradation Alternative (Selected Alternative)

a. Stream Habitat, Water Quality and Aquatic Biota

The PIK-104-10.64 project will impact nine (9) jurisdictional “waters of the United States”, including two streams, six non-isolated wetlands, and one lake (see Exhibits 3 through 12). Crooked Creek and Pee Pee Creek are the two streams that will be impacted by the project. Crooked Creek is a tributary to Pee Pee Creek, and Pee Pee Creek is a tributary to the Scioto River. The six impacted wetlands (Wetlands 1, 4, 6, 8, 9, and 10) ultimately drain into Crooked Creek or Pee Pee Creek downstream of (below) the Lake White Dam/spillway. Lake White is an artificial impoundment that was created when the Lake White Dam was constructed across the Pee Pee Creek channel. Preliminary impact estimates for two streams (Crooked Creek and Pee Pee Creek), nine wetlands (Wetlands 1, 2, 3, 4, 5, 5a, 6, 7, and 8), Lake White, and one jurisdictional pond (Pond 1) were documented in a Level 2 Ecological Survey Report (January 2013), which was coordinated with the U.S. Army Corps of Engineers (USACE), Ohio EPA (OEPA), ODNR, and the U.S. Fish and Wildlife Service (USFWS). Following a USACE field review on May 30, 2013, several wetland updates were made in the Level 2 Ecological Survey Report at the USACE’s request, including identification of an additional impacted wetland (Wetland 10). On October 9, 2013, a Jurisdictional Determination (JD) was issued by USACE (see 404 Block 26/401 Block 7 and Appendix B). The impact to Wetland 9 was determined following completion of design plans in February 2014. Physical and biological characteristics for impacted streams are presented in attached Table A. Stream impacts are summarized by fill type in Table C1 and on Exhibits 4 and 5, and photographs of the impacted streams are presented in Appendix C.

Crooked Creek and Pee Pee Creek have an OEPA Aquatic Life Use Designation of Warmwater Habitat (confirmed through field studies conducted for the PIK-104-10.64 Level 2 ESR). Impact breakdown by stream is presented below:

- > 1,115 linear feet of impact (Crooked Creek) to Warmwater Habitat (WWH)
- > 327 linear feet of impact (Pee Pee Creek) to Warmwater Habitat (WWH)
- **TOTAL STREAM IMPACTS = 1,442 linear feet**

Pee Pee Creek: Pee Pee Creek begins approximately 13 miles northwest of Lake White and drains into the Scioto River approximately one mile downstream of the Lake White Dam. Pee Pee Creek is listed as being in an impaired watershed as determined under Section 303(d) of the Federal Water Pollution Control Act, 33 USC. Section 1313(d). Pee Pee Creek is also listed on the 2012 Section 303(d) Draft List of Prioritized Impaired Waters. In the project area (downstream of the Lake White Dam spillway), this stream is bordered by highway right-of-way, upland and floodplain forest, floodplain wetlands, open space, and agricultural land. Pee Pee Creek was evaluated during field surveys for the Level 2 ESR using the Qualitative Habitat Evaluation Index (QHEI) and a score of 69 was recorded. This QHEI score is indicative of good habitat conditions. Substrate was primarily dominated by sand and cobbles with a small proportion of gravel, silt, and detritus. Pee Pee Creek is a USACE Relatively Permanent Water (Perennial). Riffles and pools were present in the project area during ecological field studies. Water quality analyses indicated low dissolved oxygen levels. Pee Pee Creek was determined to have a Warmwater Habitat Aquatic Life Use Designation based on the Index of Biotic Integrity (IBI) and Modified Index of Well-being (MIwb) scores. These findings are consistent with the WWH Aquatic Life Use Designation listed in the OAC Chapter 3745-1-09 Water Quality Standards.

Proposed construction activities in Pee Pee Creek are described in 404 Block 18/401 Block 8a and are illustrated in Exhibit 4. In summary, the Minimal Degradation (Selected) Alternative for the PIK-104-10.64 project will result in permanent and temporary construction impacts at two locations in Pee Pee Creek (within/immediately below the Lake White Dam spillway and at the terminus of the Crooked Creek channel relocation). Within the existing spillway, impacts to Pee Pee Creek involve removal and reconstruction of piers and abutment walls. The total length of impact to Pee Pee Creek within the spillway is 102 feet. With regard to water quality and aquatic/terrestrial habitat and biota, these impacts are expected to be negligible since the existing spillway is completely encased in concrete (concrete floor, concrete abutment walls and steps).

Immediately below the spillway, impacts to Pee Pee Creek primarily involve placement of permanent concrete and rock channel protection for new bridge wingwall construction (approximately 80 feet of permanent impact to Pee Pee Creek). Further downstream (approximately 1,300 feet), a 110 foot section of Pee Pee Creek will be permanently impacted below the OHWM by bank minor bank excavation and grading of earthen material to connect the relocated Crooked Creek channel to Pee Pee Creek. Bridge wingwall and other construction activities, such as roller compacted concrete construction, will likely result in the contractor establishing a temporary construction crossing and work area within the Pee Pee Creek OHWM channel. This temporary work area is expected to extend from the bottom of the spillway to a point approximately 90 feet downstream (overlapping the permanent fill impact length). The following temporary construction activities are anticipated in this area: excavation of shallow sump pit and dewatering, placement of temporary RCP for equipment crossing (estimated at 20' wide across the width of the channel), and equipment operation. A small (~ 25' wide) temporary work area in Pee Pee Creek is also expected where the Crooked Creek relocation ties into Pee Pee Creek. The total upstream-to-downstream temporary impact is 55 feet (due to channel skew), and partially overlaps the 110 foot permanent fill area. Temporary construction activities anticipated in this area include the placement of a temporary RCP flow diversion (estimated at 5' wide) and equipment operation. Excavation of a shallow sump pit and pump-around may also occur in this area. *Note: The exact timing, location, methods, and materials used for temporary construction activities are not specifically known at this time and are at the contractor's discretion.*

Permanent construction activities in Pee Pee Creek below and downstream of the spillway are not expected to be adverse, since the overall amount of permanent fill being placed in Pee Pee Creek is relatively small. The more notable impact to Pee Pee Creek is expected to occur as a result of temporary construction activities. While some temporary water quality impacts in the form of increased turbidity are expected during placement and removal of temporary fills and equipment access/operation, the primary temporary impact is expected to occur as a result of dewatering. Prior to the start of construction, Lake White will be lowered to allow for dam embankment, lake drain, and spillway bridge work to the point where no water will be flowing through the spillway into Pee Pee Creek. This dewatering, combined with the relocation of Crooked Creek (also expected to occur at the start of construction) and the potential installation of sump pits/pump-

around to dewater remaining pools of water, will likely have an extended short-term impact on aquatic biota in Pee Pee Creek. Less-mobile species (primarily macroinvertebrates, and to a lesser extent reptiles and amphibians) that occupy the impact/dewatered areas will likely be eliminated. However, there should be opportunities for some reptiles and amphibians, as well as mobile aquatic species (fish) and terrestrial species (mammals, birds) that inhabit or frequently use the Pee Pee Creek corridor to safely move out of the impact area as dewatering commences. These conditions will persist in varying degrees¹ until construction work in Lake White is complete and construction work on the Lake White Dam is far enough along to safely allow water levels to begin to rise in Lake White (estimated 6 to 8 months). Once construction is complete, Warmwater Habitat conditions are expected to quickly become re-established in Pee Pee Creek below and downstream of the spillway. Even with the relocation of Crooked Creek, hydraulic studies indicate that normal flow coming through the spillway (in conjunction with Scioto River backwater flooding and normal precipitation and runoff from the roller compacted concrete and adjacent floodplain), will be adequate to support perennial flow conditions in Pee Pee Creek after construction. Consequently, no change to (lowering of) the Pee Pee Creek Warmwater Habitat designation is expected, and impacts will be minimized to the extent possible and mitigated (see 401 Block K).

Crooked Creek: Crooked Creek begins approximately 14 miles northwest of Lake White and flows southeast and then southwest through the community of Waverly. South of Waverly, Crooked Creek parallels SR 104 and drains into Pee Pee Creek below the Lake White Dam spillway. Crooked Creek is listed as being in an impaired watershed as determined under Section 303(d) of the Federal Water Pollution Control Act, 33 USC. Section 1313(d). Crooked Creek is also listed on the 2012 Section 303(d) Draft List of Prioritized Impaired Waters. In the PIK-104-10.64 project area, this stream is bordered by highway right-of-way, upland and floodplain forest, floodplain wetlands, open space, and agricultural land. Crooked Creek was evaluated during field surveys for the Level 2 ESR using the Qualitative Habitat Evaluation Index (QHEI) and a score of 60.5 was recorded. This QHEI score is indicative of good habitat conditions. Substrate was primarily dominated by gravels and sand with a small proportion of cobbles, detritus, and silt materials. Crooked Creek is a USACE Relatively Permanent Water (Perennial). Water quality analyses indicated low dissolved oxygen levels. Crooked Creek was determined to have a Warmwater Habitat Aquatic Life Use Designation based on the Index of Biotic Integrity (IBI) and Modified Index of Well-being (MIwb) scores. These findings are consistent with the WWH Aquatic Life Use Designation listed in the OAC Chapter 3745-1-09 Water Quality Standards.

Construction activities in Crooked Creek are described in 404 Block 18/401 Block 8a and are illustrated in Exhibit 5. In summary, the Minimal Degradation (Selected) Alternative for the PIK-104-10.64 project will fill and relocate a 1,090-foot section of Crooked Creek immediately upstream of the Lake White Dam spillway. Relocating the stream will allow for new bridge wingwall construction (including placement of rock channel protection) and roller compacted concrete construction. These activities will impact approximately 335 feet of Crooked Creek. The remaining 755 feet of Crooked Creek impact will be due to the placement of earthen fill for construction of an ODNR access drive and floodplain restoration adjacent to the relocated Crooked Creek channel. A small (~ 25' wide) temporary work area in the Crooked Creek OHWM channel is anticipated at the beginning (**upstream end**) of the Crooked Creek channel relocation. Anticipated temporary construction activities in this area include placement of a temporary RCP flow diversion (estimated at 5' wide) and equipment operation. Excavation of a shallow sump pit and pump-around may also occur in this area. A small (~ 25' wide) temporary work area in the Crooked Creek OHWM channel has also been included in the spillway area due to the potential need for a temporary flow diversion/pump-around in this area (depending on the contractor's sequence of construction); however, this temporary impact area is not included in the total linear foot and area impact for Crooked Creek since it overlaps with an area that will ultimately be permanently filled for roller compacted concrete

¹ The relocation of Crooked Creek is expected to occur at the start of construction in conjunction with the lowering of the water level in Lake White so that the contractor can perform construction work below the spillway and along the SR 104/Lake White Dam embankment under dry conditions. Once the relocation of Crooked Creek is complete, the effects of the lowering of the water level in Lake White will be lessened for the segment of Pee Pee Creek between relocated Crooked Creek and the Scioto River.

construction. *Note: The exact timing, location, methods, and materials used for these temporary construction activities are not specifically known at this time and are at the contractor's discretion.*

Existing aquatic habitat in Crooked Creek will be permanently lost in the 1,090-foot permanent fill area. Temporary water quality impacts in the form of increased turbidity are also expected during placement and removal of temporary fills and equipment access/operation. However, the relocation of Crooked Creek is only expected to have a short-term impact on aquatic biota and overall water quality. Less-mobile species (primarily macroinvertebrates, and to a lesser extent reptiles and amphibians) that occupy the impact area will likely be eliminated by permanent and temporary fill placement in Crooked Creek; however, there should be opportunities for some reptiles and amphibians, as well as more mobile aquatic species (fish) and terrestrial species (mammals, birds) that inhabit or frequently use the Crooked Creek corridor, to utilize the new relocated Crooked Creek channel to safely move out of the impact area as construction begins below the SR 104/Lake White Dam embankment. Following construction, Warmwater Habitat conditions are expected to quickly become established within the proposed 1,070-foot relocated Crooked Creek channel. As illustrated in Exhibit 5, the new Crooked Creek channel will be constructed using natural channel design techniques, which will provide a higher-quality channel than currently exists in the project area. The proposed channel will provide a more natural and stable channel pattern, profile, and dimension and will have a better riparian/floodplain connection which will improve long-term water quality and habitat for aquatic and terrestrial species. Consequently, no change to (lowering of) the Crooked Creek Warmwater Habitat designation is expected, and impacts will be minimized to the extent possible and mitigated (as proposed in Table H and 401 Block K).

b. Wetlands

The Minimal Degradation (Selected) Alternative will impact six jurisdictional wetlands - Wetlands 1, 4, 6, 8, 9, and 10. As described above, impacts to wetlands were assessed in a Level 2 Ecological Survey Report (January 2013), which was coordinated with USACE, OEPA, ODNR, and USFWS. Following a USACE field review on May 30, 2013, several wetland updates were made in the Level 2 Ecological Survey Report at the USACE's request, including identification of an additional impacted wetland (Wetland 10). On October 9, 2013, a Jurisdictional Determination (JD) was issued by USACE (see 404 Block 26/401 Block 7 and Appendix B). The impact to Wetland 9 was determined following completion of design plans in February 2014. Physical and biological characteristics for impacted wetlands are presented in attached Table B1. Wetland impacts are summarized by fill type in Table C2 and on Exhibits 6 through 11, and photographs of the impacted wetlands are presented in Appendix C.

Wetland 1: Wetland 1 is a 1.06 acre forested, Category 2 wetland (ORAM Score 51.5) located on the east side of the Lake White Dam/SR 104 embankment, east of the SR 104/SR 551 intersection. Roller compacted concrete (RCC) construction is expected to permanently impact 0.002 acre of Wetland 1 through the placement of rock channel protection (RCP) and granular material. Additional construction impacts (tree/vegetation clearing and equipment access and operation) are also expected along the east edge of the RCC limits (0.022 acre). Though there are no permanent or temporary fills expected in this 0.022 acre area, this is considered a permanent impact due to the long-term alteration of forested wetland area. The remainder of the wetland will be flagged in the field and labeled as "Do Not Disturb" in the final design plans. Overall, construction of the Minimal Degradation (Selected Alternative) is not expected to change (lower) the Category 2 status of this wetland. **Wetland 1 Total Impact = 0.024 acre.**

Wetland 4: Wetland 4 is a 0.09 acre scrub shrub, Modified Category 2 wetland (ORAM Score 43.0) located on the east side of the Lake White Dam/SR 104 embankment, south of the Lake White Dam spillway. Roller compacted concrete (RCC) construction is expected to permanently fill 0.019 acre of Wetland 4 through the placement of earthen material, granular material, and rock channel protection (RCP). Additional construction impacts (shrub/vegetation clearing and equipment access and operation) are also expected along the east and north edge of the RCC limits (0.019 acre). Though there are no permanent or temporary fills expected in this 0.019 acre area, this is considered a permanent impact due to the long-term

alteration of scrub shrub wetland area. The remainder of the wetland will be flagged in the field and labeled as “Do Not Disturb” in the final design plans. No impacts are expected to Pond 1, Wetland 5, or Wetland 5a, which abut Wetland 4. The boundaries of these features will also be flagged and labeled as “Do Not Disturb” in the final design plans. Overall, construction of the Minimal Degradation (Selected Alternative) is not expected to change (lower) the Category 2 status of this wetland. **Wetland 4 Total Impact = 0.038 acre.**

Wetland 6: Wetland 6 is a 0.61 acre emergent/scrub shrub, Category 2 wetland (ORAM Score 52.5) located on the east side of the Lake White Dam/SR 104 embankment, just south of the Lake White Dam spillway. Roller compacted concrete (RCC) and wingwall footer construction is expected to permanently fill 0.121 acre of Wetland 6 through the placement of earthen material, granular material, rock channel protection (RCP), and concrete. **Additional construction impacts (shrub/vegetation clearing and equipment access and operation) are also expected along the east edge of the RCC limits (0.019 acre).** Though there are no permanent or temporary fills expected in this 0.019 acre area, this is considered a **permanent impact due to the long-term alteration of scrub shrub wetland area.** The remainder of the wetland will be flagged in the field and labeled as “Do Not Disturb” in the final design plans. No impacts are expected to Wetland 7. This wetland will also be flagged and labeled as “Do Not Disturb” in the final design plans. Overall, construction of the Minimal Degradation (Selected Alternative) is not expected to change (lower) the Category 2 status of this wetland. **Wetland 6 Total Impact = 0.140 acre.**

Wetland 8: Wetland 8 is a 3.00 acre forested, Category 2 wetland (ORAM Score 59.0) located in the floodplain between Crooked Creek and Pee Pee Creek below the Lake White Dam spillway. This wetland directly abuts Pee Pee Creek. The alignment for the proposed relocation/restoration of Crooked Creek is immediately to the north and west of Wetland 8. A minor 0.011 acre earthen fill/embankment grading impact is expected at the eastern end of Wetland 8 where the proposed relocated Crooked Creek channel ties back in to Pee Pee Creek. **Additional construction impacts (tree/vegetation clearing and equipment access and operation) are also expected along the Crooked Creek relocation grading limits (0.031 acre).** Though there are no permanent or temporary fills expected in this 0.031 acre area, this is considered a **permanent impact due to the long-term alteration of forested wetland area.** The remainder of the wetland will be flagged in the field and labeled as “Do Not Disturb” in the final design plans. Overall, construction of the Minimal Degradation (Selected Alternative) is not expected to change (lower) the Category 2 status of this wetland. **Wetland 8 Total Impact = 0.042 acre.**

Wetland 9: Wetland 9 is a 0.09 acre emergent, Category 2 wetland (ORAM Score 50.0) located at the north end of the project between Crooked Creek and the SR 104 roadway embankment. This wetland directly abuts Crooked Creek. **No permanent or temporary excavation or fill impacts are expected in this wetland; however, the proposed filling and relocation of the existing Crooked Creek channel is expected to have a permanent (indirect) impact on this feature due to long-term loss of wetland hydrology, and ultimately wetland function.** **Wetland 9 Total Impact = 0.090 acre.**

Wetland 10: Wetland 10 is a 0.040 acre emergent, Category 2 wetland (ORAM score of 50.5) located near the north end of the project between Crooked Creek and the SR 104 roadway embankment. This wetland directly abuts Crooked Creek. The entire 0.040 acre wetland will be filled (earthen fill) for construction of an ODNR access drive. **Wetland 10 Total Impact = 0.040 acre.**

All of these wetlands are moderate-quality features based on ORAM scores ranging from 43.0 to 59.0. With the exception of Wetland 9 and Wetland 10, the wetland impacts involve only minor fringe disturbances with limited permanent impact. Following construction, Wetlands 1, 4, 6, and 8 are expected to retain their overall wetland function and benefit to the local environment, and are expected to retain their Category 2 wetland status. Wetland 9 is expected to lose wetland hydrology and wetland function over the long-term, and Wetland 10 will be completely filled; however, both of these features are small, and since Wetland 10 is located within the Crooked Creek OHWM channel, it functions more as a

vegetated bar within an active stream channel than a typical floodplain wetland (such as Wetland 8). Consequently, impacts to these six wetlands are not expected to be adverse to the local environment and will be mitigated (as proposed in Table H and 401 Block K).

c. Lake White

The Minimal Degradation (Selected) Alternative will impact Lake White (2.222 acres of permanent impact and 0.481 acre of temporary impact). Impacts to Lake White were assessed in a Level 2 Ecological Survey Report (January 2013), which was coordinated with the USACE, OEPA, ODNR, and the USFWS. On October 9, 2013, a Jurisdictional Determination (JD) was issued by USACE (see 404 Block 26/401 Block 7 and Appendix B). Physical and biological characteristics for impacted Lake White are presented in Table B2. Lake White impacts are summarized by fill type in Table C3 and on Exhibit 12. Photographs of Lake White are presented in Appendix C.

Lake White is a 337 acre recreational lake that was created by the construction of the SR 104/Lake White Dam embankment across Pee Pee Creek. The Lake White Dam spillway directs Lake White overflow back to the natural Pee Pee Creek channel at its confluence with Crooked Creek. Pee Pee Creek then drains into the Scioto River approximately 1.5 miles downstream. Lake White is considered to be a Traditional Navigable Water by USACE, and is designated as an Exceptional Warmwater Habitat in accordance with OAC 3745-1-07 (B)(1)(c). Construction activities below the Lake White OHWM include: 1) a boat ramp extension in Lake White State Park at the south end of the project, 2) placement of rock channel protection along the top of the Lake White Dam/SR 551/SR 104 embankment, and 3) construction of a new lake drain. Prior to these construction activities, the water level in Lake White will be lowered (to approximately 564' elevation). Due to the size of the lake and the overall minor construction activities proposed, no long term water quality or habitat impacts are anticipated, and short-term construction impacts are not expected to be adverse. During construction, less-mobile species (primarily macroinvertebrates, and to a lesser extent reptiles and amphibians) that occupy the impact area could be eliminated by permanent and temporary fill placement in Lake White; however, since the overall impact area within in Lake White is relatively small and water levels will be lowered slowly, there will be opportunities for less-mobile aquatic species, as well as mobile species (fish) and terrestrial species (mammals, birds) that inhabit or frequently use the Lake White shoreline area to safely move out of the impact zone as construction begins. Water levels in Lake White will be restored to normal pool elevations once construction work in Lake White is complete and construction work on the Lake White Dam is far enough along to safely allow water levels to begin to rise in Lake White (estimated 6 to 8 months). Once water levels are restored, normal water quality and aquatic habitat conditions within Lake White and along the Lake White shoreline are expected to quickly become re-established. Impacts will be minimized to the extent possible through the use of Best Management Practices (see 401 Block 10k). **Lake White Total Impact = 2.703 acres.**

d. Terrestrial Habitats/Plant Life

As described in the Level 2 ESR, impacts to terrestrial habitats and plant/animal life within the Minimal Degradation (Selected) Alternative will be limited, as the vast majority of the project is located within existing SR 104, SR 551, and SR 552 right-of-way or within existing Lake White Dam embankment area. No unique vegetative communities or animal/plant assemblages were encountered during ecological field surveys, and the project impact area is primarily comprised of disturbed right-of-way and other open habitats. A substantial portion of the large Beck's Superior Hybrids property to the east of SR 104 is protected by a USDA conservation easement; however, the PIK-104-10.64 project is currently not expected to impact this easement. The PIK-104-10.64 project will impact approximately 3.8 acres of upland and floodplain forest due to construction along Crooked Creek and Pee Pee Creek downstream of the spillway (updated from the Level 2 ESR), though the relocation of Crooked Creek includes a plan to restore approximately three acres of floodplain forest on ODNR property in the Crooked Creek/Pee Pee Creek floodplain.

Overall, the impact footprint of the Minimal Degradation (Selected) Alternative is small (primarily confined to existing disturbed areas), and impacts to terrestrial habitats and plant life are expected to be minor. Plant and animal species observed during ecological field surveys conducted for this project are common and generally well adapted to human disturbances, and should quickly recolonize or become re-established once construction is complete. Consequently, construction of the Minimal Degradation (Selected) Alternative should not result in local or regional decline in any natural or semi-natural habitat types, and no extirpation of taxa or significant decline in population within any taxa is expected (plant or animal). Due to the transient nature of the animal and bird species encountered in project area during ecological surveys, only temporary displacement during construction is anticipated. Also, since similar habitat types are plentiful in the project vicinity, no long-term adverse impacts to any terrestrial animal species are expected as a result of this project. Best Management Practices will be implemented to minimize impacts to terrestrial habitats (see 401 Block 10k).

e. Threatened and Endangered Species

No federal-listed species were encountered during ecological field surveys conducted for the PIK-104-10.64 project. As documented in Appendix B, a Level 2 Ecological Survey Report (ESR) was prepared for the PIK-104-10.64 project and was coordinated with the USACE, OEPA, ODNR, and the USFWS. In response to this coordination, the USFWS reported that the project lies within the range of the federal endangered Indiana bat (*Myotis sodalis*), clubshell mussel (*Pleurobema clava*), northern riffleshell mussel (*Epioblasma torulosa rangiana*), and rayed bean mussel (*Villosa fabalis*). The project also occurs within the range of the federal species of concern and state endangered timber rattlesnake (*Crotalus h. horridus*) and federal species of concern bald eagle (*Haliaeetus leucocephalus*). Natural Heritage Program data from ODNR revealed no known occurrences of federal-listed or state-listed species within one mile of the project area. However, in an email dated May 17, 2013, ODNR-Division of Wildlife (DOW) commented that the project is within the range of the following additional state endangered species: shortnose gar (*Lepisosteus platostomus*), mountain madtom (*Noturus eleutherus*), northern madtom (*Noturus stigmosus*), black bear (*Ursus americanus*), bobcat (*Lynx rufus*), Bewick's wren (*Thryomanes bewickii*), eastern spadefoot toad (*Scaphiopus holbrookii*), and eastern hellbender (*Cryptobranchus alleganiensis alleganiensis*). A summary of the conclusions regarding each of these species is presented below:

Indiana Bat - Indiana bat is listed as federal endangered by USFWS and its known range includes Pike County. An ODNR Heritage Database review determined there are no records for Indiana bat capture locations within a five mile radius, or hibernacula within a ten mile radius of the Minimal Degradation (Selected) Alternative. No occurrences of Indiana bat or Indiana bat hibernacula were recorded during ecological field surveys conducted for the PIK-104-10.64 project (though no detailed survey/mist netting was completed). Summer habitat requirements for Indiana bat include: 1) dead or live trees and snags with peeling or exfoliating bark, split tree trunks and/or branches, or cavities, which may be used as maternity roost areas, 2) live trees (such as shagbark hickory) which have exfoliating bark, and/or 3) stream corridors, riparian areas, and upland woodlots which provide forage sites. Ten (10) trees exhibiting potential summer roosting habitat occur in the Minimal Degradation (Selected) Alternative impact area (updated from the Level 2 ESR). In response to ecological coordination, USFWS concurred in a letter dated May 31, 2013 that the PIK-104-10.64 project **may affect, but is not likely to adversely affect** Indiana bat. The subject project falls under the 2007 Programmatic Consultation (PC) for the Indiana bat among USFWS, FHWA, and ODOT. The project is within the PC1-a category of project impacts, so no cutting restrictions are required; however the USFWS requested that ODOT adhere to the current cutting date restrictions. Additionally, ODNR commented in an email dated May 17, 2013 that suitable Indiana bat tree habitat within the project area should be conserved, but if trees must be cut, then cutting must occur between October 1 and March 31. If suitable Indiana bat trees must be cut during the summer months, a net survey must be conducted between June 15 and July 31, prior to cutting. Net surveys are to incorporate either two net sites per square kilometer of project area with each net site containing a minimum of two nets used for two consecutive nights, or one net site per kilometer of stream within the project limits with each net site containing a minimum of two nets used for two consecutive nights. In response to the USFWS and ODNR tree cutting requests, ODOT has committed to clearing wooded habitat only between October 1 and March 31 (see Block 10k).

Clubshell Mussel, Northern Riffleshell Mussel, and Rayed Bean Mussel - The Minimal Degradation (Selected) Alternative occurs within the range of the federal endangered clubshell mussel and the federal and state endangered northern riffleshell mussel and rayed bean mussel. In response to ecological coordination (Level 2 ESR), USFWS concurred that the PIK-104-10.64 project will have **no effect** on federal endangered mussels. ODNR commented in an email dated May 17, 2013 that since there is no history of mussels in the vicinity of the project area, this project is not likely to have an impact on mussel species.

Timber Rattlesnake - The Minimal Degradation (Selected) Alternative occurs within the range of the federal species of concern and state endangered timber rattlesnake (*Crotalus h. horridus*). In response to ecological coordination (Level 2 ESR) USFWS concurred that the PIK-104-10.64 project will have **no effect** on the timber rattlesnake, and appreciated ODOT's commitment to instruct workers not to harm or kill timber rattlesnakes if encountered in the project area and to caution workers that the species is venomous. ODNR commented in an email dated May 17, 2013 that due to the location of the project, the project is not likely to impact timber rattlesnake.

Bald Eagle - The Minimal Degradation (Selected) Alternative occurs within the range of the federal species of concern bald eagle (*Haliaeetus leucocephalus*). In response to ecological coordination (Level 2 ESR), USFWS concurred that the PIK-104-10.64 project will have **no effect** on the bald eagle. According to ODNR, the nearest known bald eagle nest is located approximately 10 miles away from the project.

Shortnose Gar, Mountain Madtom, and Northern Madtom - ODNR noted that the PIK-104-10.64 project is located within the range of the state endangered shortnose gar (*Lepisosteus platostomus*), mountain madtom (*Noturus eleutherus*), and northern madtom (*Noturus stigmosus*). None of these fish species were encountered during the fish surveys conducted in Crooked Creek and Pee Pee Creek for this project, and the PIK-104-10.64 project is not expected to adversely impact shortnose gar, mountain madtom, or northern madtom. However, ODNR recommended in an email dated May 17, 2013 that no in-water work in perennial Warmwater Habitat streams take place between April 15 and June 30 to reduce impacts to indigenous aquatic species and their habitat. In-stream work will be minimized to the extent possible between April 15 and June 30; however, due to tight schedule constraints with regard to lake drain and roller compacted concrete construction and the lowering of water levels in Lake White, complete avoidance of in-stream work during this time frame is not likely to be feasible (see also 401 Block 10k).

Black Bear and Bobcat - ODNR noted that the PIK-104-10.64 project is located within the range of the state endangered black bear (*Ursus americanus*) and bobcat (*Lynx rufus*). No black bear or bobcat were encountered during field surveys conducted for this project. ODNR commented in an email dated May 17, 2013 that due to the mobility of these species, the project is not likely to have an impact on black bear or bobcat.

Bewick's Wren - ODNR noted that the PIK-104-10.64 project is located within the range of the state endangered Bewick's wren (*Thryomanes bewickii*). No Bewick's wren were encountered during field surveys conducted for this project. ODNR commented in an email dated May 17, 2013 that a statewide survey has not been completed for this species, and that a lack of records does not indicate the species is absent from the area. Therefore, if tree removal is proposed, it must not take place during the species' nesting period of April 1 to August 31. ODOT has committed to clearing wooded habitat only between October 1 and March 31 (see 401 Block 10k), which includes the specified dates for Bewick's wren.

Eastern Spadefoot Toad - ODNR noted that the PIK-104-10.64 project is located within the range of the state endangered eastern spadefoot toad (*Scaphiopus holbrookii*). No eastern spadefoot toad were encountered during field surveys conducted for this project. ODNR commented in an email dated May 17, 2013 that this species is found in areas of sandy soils that are associated with river valleys. Breeding habitats may include flooded agricultural fields or other water-holding depressions. Based on its proximity to known sites for this species, if the type of habitat described above exists at the project site, ODNR recommends an eastern spadefoot toad habitat survey be completed to determine the potential for impacts to this species. Because of their fossorial habits, unpredictable breeding season, and short larval period, the

survey should only be conducted by a herpetologist approved by the ODNR - Division of Wildlife. Prior to construction, ODOT will conduct a field review of the Minimal Degradation (Selected) Alternative. If suitable habitat for eastern spadefoot toad is found, a survey will be performed by an approved herpetologist (see 401 Block 10k).

Eastern Hellbender - ODNR noted that the PIK-104-10.64 project is located within the range of the state endangered eastern hellbender (*Cryptobranchus alleganiensis alleganiensis*). No eastern hellbender were encountered during field surveys conducted for this project, and no suitable habitat (large, swift-flowing, shallow, highly-oxygenated streams with large rocks) are located in the project area. ODNR recommended in an email dated May 17, 2013 that the proposed project be developed to minimize indirect stream impacts (e.g., preserve wide riparian buffers, maximize erosion control, maximize permeable surfaces and storm-water retention).

Threatened and Endangered Species Update - The current USFWS species list for Pike County now identifies the northern long-eared bat (*Myotis septentrionalis*) as federal (proposed) endangered. The northern long-eared bat was not discussed in the agency coordination in Appendix B, since the Level 2 ESR coordination occurred prior to the proposed listing of this species. A final ruling by USFWS on the listing of northern long-eared bat is expected in April 2015. The USFWS provided ODOT a Technical Guidance on Updated Species List email dated November 2013 that stated: "The Service concurs with ODOT's "may affect but not likely to adversely affect" determination for the northern long-eared bat on any project for which: 1) ODOT has already consulted with the Service, and 2) surveys, if conducted, did not detect MYSE in the project area, and 3) the Service has concurred with ODOT's determination that the project may affect but is not likely to adversely affect the Indiana bat (*Myotis sodalis*), and 4) ODOT has committed to seasonal clearing of trees (clearing only between September 30 and April 1)." Conditions 1, 3, and 4 are satisfied for this project (see Indiana bat discussion above).

f. Commercial or Recreational Sport Fish Species or Other Important Species

The Minimal Degradation (Selected) Alternative is not expected to impact commercial or recreational sport fish in Crooked Creek, Pee Pee Creek, or Lake White. No commercial fishing is conducted in any of these waters. Proposed construction activities are not expected to have any long-term effect on sport fish in Crooked Creek, Pee Pee Creek, or Lake White. However, during construction, the lowering of the water level in Lake White to approximately 564' will have a short term impact on accessibility to Lake White for fishing due to the likely loss of use of boat ramps and docks around the lake. This temporary impact will likely last for 6 to 8 months. Public fishing is also popular at the confluence of Crooked Creek and Pee Pee Creek below the Lake White Dam spillway. In-stream work will be minimized in Crooked Creek or Pee Pee Creek between April 15 and June 30 to the extent possible. However, during construction, the lowering of the water level in Lake White, along with the dewatering of Pee Pee Creek for spillway bridge construction, and the relocation of Crooked Creek will have a short term impact on public fishing in Pee Pee Creek and Crooked Creek. Access to this fishing area will be lost for an extended period of time during construction, and sport fish are expected to vacate the area until construction is complete and permanent flow in Pee Pee Creek and relocated Crooked Creek is restored. The duration of this impact is also expected to be 6 to 8 months. However, due to the proposed relocation of Crooked Creek using natural stream design techniques, and the overall limited amount of fill to be placed in Pee Pee Creek, no long-term effects on public/sport fishing in Pee Pee Creek or Crooked Creek is anticipated.

2. Preferred Alternative

Compared to the Minimal Degradation (Selected) Alternative, the Preferred Alternative will have similar impacts on Crooked Creek, Wetlands 8, 9, and 10, threatened and endangered species, and commercial/recreational sport fish. However, due to the wider impact footprint (approximately 30 feet wider in roller compacted concrete construction areas), the Preferred Alternative will impact an additional 1.6 acres of forested habitat, most of which is located on the Beck's Superior Hybrid/USDA conservation easement property and ODNR property. The Preferred Alternative would also extend permanent fill impacts and the temporary impact area for Pee Pee Creek (Warmwater Habitat) an additional 30 feet downstream below the spillway, and would require an additional 0.307 acre of wetland impact (total) from Wetlands

1, 4, and 6 (Category 2 wetlands). Wetland impacts would also increase by 0.009 acre due to shrub/vegetation removal and temporary fill impacts in Wetland 7 (Category 2) since the impact zone for Pee Pee Creek would be extended approximately 30 feet downstream (total increase in wetland impact compared to the Minimal Degradation Alternative is 0.316 acre). The loss of this additional habitat is notable, particularly the additional 0.316 acre of Category 2 wetland impact, which is nearly equivalent to the total amount of wetland impact for the entire Minimal Degradation (Selected) Alternative. This increased wetland impact would have to be mitigated off-site at a 2:1 or 2.5:1 ratio, which would raise the total amount of wetland mitigation needed for the Preferred Alternative to approximately one acre (see Table H and 401 Block 10k).

3. Non-Degradation Alternative

The Non-Degradation (No Build) Alternative involves no improvements to existing SR 104, Lake White Dam, or the SR 104 bridge over the Lake White Dam spillway. This alternative would have no immediate impact on Lake White, Pee Pee Creek, Crooked Creek, wetlands, ponds, terrestrial habitats, threatened and endangered species, or any other project area environmental resources, and would cause no near-term water quality degradation. However, the Non-Degradation Alternative would not address any of the critical Purpose and Need elements described in Block 8a (dam safety, spillway bridge deterioration, SR 104 improvement needs). Implementation of the Non-Degradation Alternative would result in gradual infrastructure deterioration and further dam and transportation safety problems, which would be exacerbated by future flood events and higher traffic volumes. This could potentially result in a catastrophic dam failure which would cause extensive downstream flooding and likely result in the loss of human life. Deteriorating road and bridge conditions and higher traffic volumes would also result in a greater potential for accidents in the Lake White Dam area, including spills of fuels or other hazardous materials which could eventually reach project area surface waters, groundwater, and terrestrial habitats. Consequently, under the Non-Degradation Alternative scenario, impacts to streams, wetlands, and Lake White would be expected in the future due to the continual need for roadway and dam maintenance projects, along with occasional larger-scale emergency projects, in an effort to keep SR 104 open to traffic and to avoid a critical dam failure. The monetary cost of these future maintenance projects and the associated environmental impacts/mitigation would eventually exceed those of the Minimal Degradation (Selected) Alternative, and would likely result in social and economic impacts due to road closures/traffic detours, loss of access to the Lake White State Park area, and an overall decline in attractiveness from a recreation/tourism standpoint. For these reasons, the Non-Degradation Alternative is not considered to be a safe or practicable alternative for the PIK-104-10.64 project, even though near-term water resource/water quality impacts and other environmental impacts associated with this alternative would be minimal.

Block 10c.

Include a discussion of the technical feasibility, cost effectiveness, and availability. In addition, the reliability of each alternative shall be addressed (including potential recurring operational and maintenance difficulties that could lead to increased surface water degradation). (OAC 3745-1-05(C)(6)(h, j-k) and OAC 3745-1-54).

1. Minimal Degradation Alternative (Selected Alternative)

The Minimal Degradation (Selected) Alternative for the PIK-104-10.64 project has undergone detailed engineering and drainage review in accordance with current ODOT design and construction standards. Design plans for this project have been completed and approved by ODOT, and therefore the project is considered to be technically feasible to construct, and the materials and resources needed to build the project are readily available. The construction cost of the Minimal Degradation (Selected) Alternative in 2014 dollars is \$33,886,829 (see Table E), which ODOT has determined to be reasonable. The techniques to be used to construct the project have been accomplished on numerous occasions with other transportation and dam safety projects. The techniques that will be used have proven to be both reliable and cost effective, and therefore the potential for recurring operational and maintenance difficulties that could lead to additional

future surface water degradation is minimal. ODOT and ODNR will be responsible for the future maintenance of roadway, spillway bridge, Lake White Dam/spillway, and drainage structures in the project area.

The proposed project will provide a long-term remedy for the existing dam safety issues, the deteriorated spillway bridge, and transportation deficiencies and safety improvements that are needed in the project area. While construction of the project will initially impact two streams, six wetlands, and Lake White, the project is expected to reduce the frequency and magnitude of future stream, wetland and/or Lake White impacts due to recurring maintenance and emergency safety project needs. Additionally, improved roadway conditions are expected to reduce the potential for serious accidents which could result in fuel spills or other hazardous material contamination of area surface waters (see also Non-Degradation Alternative discussion below). Normal operation and maintenance activities in the project area following construction area expected to be minor, overall. Low levels of oil, grease, and particulates from vehicular traffic, as well as de-icing salts and pesticides and herbicides from roadway/dam embankment maintenance are expected to eventually reach project area streams, wetlands, and Lake White. These impacts, while not discountable, are considered to be minor, overall, and already occur in the project area along existing SR 104/Lake White Dam and the adjacent local road network. These impacts will also be minimized through implementation of post-construction Best Management Practices (BMP's) for stormwater runoff, and a Stormwater Pollution Prevention Plan will be developed and implemented by the contractor to address stormwater runoff and erosion and sediment control during construction (see also 401 Block 10f).

2. Preferred Alternative

The Preferred Alternative involves the same overall design as the Minimal Degradation Alternative, with one exception: 3:1 roller compacted concrete (RCC) slopes compared to the Minimal Degradation Alternative's 2:1 slopes, as described in Block 10a and as illustrated in Appendix D. While the Preferred Alternative has not been designed to the same level of detail as the Minimal Degradation (Selected) Alternative, the conceptual design shown in Appendix D is considered to be technically feasible and cost effective and the construction techniques are proven. The construction cost of the Preferred Alternative in 2014 dollars is \$35,225,527 (see Table E). Overall, the design life of the roadway, bridge, and dam improvements associated with the Preferred Alternative, as well as future operation and maintenance activities, are the same as the Minimal Degradation (Selected) Alternative.

3. Non-Degradation Alternative

The Non-Degradation (No Build) Alternative is not considered to be a technically feasible alternative for the PIK-104-10.64 project. As previously discussed, this alternative involves no improvements to existing SR 104, Lake White Dam, or the SR 104 bridge over the Lake White Dam spillway, and would not address any of the critical Purpose and Need elements described in Block 8a (dam safety, spillway bridge deterioration, SR 104 improvement needs). Implementation of the Non-Degradation Alternative would result in gradual infrastructure deterioration and further dam and transportation safety problems, which would be exacerbated by future flood events and higher traffic volumes. This could potentially result in a catastrophic dam failure which would cause extensive downstream flooding and likely result in the loss of human life. Deteriorating road and bridge conditions and higher traffic volumes would also result in a greater potential for accidents in the Lake White Dam area, including spills of fuels or other hazardous materials which could eventually reach project area surface waters, groundwater, and terrestrial habitats. Consequently, under the Non-Degradation Alternative scenario, impacts to streams, wetlands, and Lake White would be expected in the future due to the continual need for roadway and dam maintenance projects, along with occasional larger-scale emergency projects, in an effort to avoid critical infrastructure failures. The cost of these future maintenance projects and the associated environmental impacts/mitigation would eventually exceed those of the Minimal Degradation (Selected) Alternative, and would likely result in social and economic impacts due to road closures/traffic detours, loss of access to the Lake White State Park area, and an overall decline in attractiveness from a recreation/tourism standpoint.

Block 10d.

For regional sewage collection and treatment facilities, include a discussion of the technical feasibility, cost effectiveness and availability, and long-range plans outlined in state or local water quality management planning documents and applicable facility planning documents. (OAC 3745-1-05(C)(6)(i)).

The proposed PIK-104-10.64 project does not involve any regional sewage collection or treatment facilities.

Block 10e.

To the extent that information is available, list and describe any government and/or privately sponsored conservation projects that may exist or may have been formed to specifically target improvement of water quality or enhancement of recreational opportunities on the affected water resource. (OAC 3745-1-05(B)(2)(g)).

The Pike County Soil and Water Conservation District (SWCD) Office was contacted in July 2014 to determine if the agency was aware of current or future plans for stream, wetland, or lake enhancement or conservation projects that involve the water resources affected by the PIK-104-10.64 project. The Pike County SWCD responded that it is not aware of any specific current or future projects at this time. An internet search for government and/or privately sponsored conservation/enhancement projects in the Pee Pee Creek and Crooked Creek watershed or along the Scioto River in Pike County did not identify any such projects.

There is a U.S. Department of Agriculture (USDA) conservation easement in project area, on the Beck's Superior Hybrid property along the east side of the SR 104/Lake White Dam embankment (see Exhibits 1b, 4, 6, 7, and 8 and Appendix A). A smaller ODNR flowage easement also exists between the Lake White Dam embankment and the USDA easement area (see Exhibits 4, 6, 7, and 8 and Appendix A). The PIK-104-10.64 project will encroach on the ODNR flowage easement, but is not currently expected to impact the USDA conservation easement.

The lower Scioto River watershed was studied by OEPA in 2011, including the Crooked Creek and Pee Pee Creek Watershed Assessment Units (WAU's). The PIK-104-10.64 project occurs within the Crooked Creek and Pee Pee Creek WAU's. Extensive biological, physical habitat, and chemical water quality monitoring was conducted in 2011 at sites in the lower Scioto River basin. Compilation of the Technical Support Document (TSD) and development of TMDLs for pollutants impairing designated or recommended aquatic life uses are underway. Status reports and analyses can be accessed via the Scioto River (lower) tab at <http://epa.ohio.gov/dsw/tmdl/SciotoRiver.aspx>. Crooked Creek is in full attainment of the Warmwater Habitat aquatic life use assessment. The recreational use assessment for Crooked Creek is listed as impaired; TMDL needed. Bacteria were listed as the cause of impairment for Crooked Creek. Pee Pee Creek is listed as impaired with half of the sites assessed for aquatic life use being in partial attainment status for Warmwater Habitat. Causes of impairment for Pee Pee Creek are listed as natural conditions (flow or habitat) with the sources of impairment listed as natural sources.

Regarding recreational opportunities, as discussed in Block 8a, the 337-acre Lake White was originally constructed in 1935 through construction of the Lake White Dam across Pee Pee Creek. Lake White was officially dedicated as a state park in 1949 (operated/maintained by ODNR), though most of the land surrounding the lake is privately owned. Public boat docks, a swimming area, and picnic/camping grounds are located in Lake White State Park near the intersection of SR 104 and SR 551. The Minimal Degradation (Selected) Alternative will impact a small portion of these public recreational areas (including Lake White). Section 4(f) of the U.S. Department of Transportation Act of 1966 protects public recreational areas from impacts by federally-funded or federally-permitted projects though inter-agency coordination and consideration of avoidance/minimization alternatives, which are documented as part of the National Environmental Policy Act (NEPA) process. The Lake White State Park is managed by ODNR - Division of Parks and Recreation as a public recreational facility. Consequently, as part of the PIK-104-10.64 project, mitigation measures have been developed under

Section 4(f) for impacts to Lake White State Park, including restroom, parking lot, boat ramp/dock, activity building, and playground improvements. Project funding for these improvements totals approximately \$500,000.

Additionally, ODNR owns property below and to the north of the spillway that is planned for future use as a Pee Pee Creek/Scioto River public access area (hiking, canoeing, etc.). The PIK-104-10.64 project includes construction of an access drive to this ODNR property, and ODNR ultimately plans to construct a small parking area adjacent to the access drive. The PIK-104-10.64 project also utilizes a portion of this ODNR property for mitigation of stream impacts (Crooked Creek relocation/restoration), as presented in 401 Block 10k and Appendix E.

With regard to the Preferred Alternative (use of 3:1 slopes for roller compacted concrete instead of the Minimal Degradation Alternative's 2:1 slopes), construction of this alternative would not only result in additional impacts to streams, wetlands, and Lake White (see Block 10b), but also to Lake White State Park recreational areas, the ODNR property north of the spillway, and the USDA conservation easement property. These additional impacts would require additional stakeholder coordination, environmental documentation, real estate coordination/acquisition, Section 4(f) mitigation, and stream and wetland mitigation. The Non-Degradation Alternative would have no immediate impact on any recreational areas or easements, though as previously discussed (see Block 10.b.3 and 10.c.3), the Non-Degradation Alternative is not a safe or practicable alternative for this project.

Block 10f.

Provide an outline of the costs of water pollution controls associated with the proposed activity. This may include the cost of best management practices to be used during construction and operation of the project. (OAC 3745-1-05(C)(6)(g)).

1. Minimal Degradation Alternative (Selected Alternative) and Preferred Alternative

Short-term water quality impacts due to runoff from disturbed areas during construction will be minimized through the use of sediment and erosion controls in accordance with the ODOT *Construction and Materials Specifications (2013)*, including Section 107.19 (environmental protection), Section 601 (slope and channel protection), Section 659 (seeding and mulching), and Supplemental Specification 832 (Temporary Erosion and Sediment Control), which conform to Ohio EPA's National Pollutant Elimination Discharge System (NPDES) requirements for construction stormwater management. Notes and estimated quantities are included in the PIK-104-10.64 design plans to handle erosion and sediment control, and a Stormwater Pollution Prevention Plan will be developed and implemented by the contractor during construction. Longer-duration water quality impacts associated with roadway and other construction area runoff will be minimized through the implementation of post-construction BMPs in accordance with the ODOT *Location and Design Manual - Volume 2*. The estimated cost of water pollution controls for the Minimal Degradation (Selected) Alternative is \$1,367,534 (see Table F). The estimated cost of water pollution controls are expected to be similar (\$1,407,061) for the Preferred Alternative.

2. Non-Degradation Alternative

There will be no immediate costs associated with water pollution controls for the Non-Degradation (No Build) Alternative except those associated with maintenance activities conducted in the PIK-104-10.64 project area. However, as previously discussed (see Blocks 10.a.3, 10.b.3 and 10.c.3), the Non-Degradation Alternative is not a safe or practicable alternative for this project.

Block 10g.

Describe any impacts on human health and the overall quality and value of the water resource. (OAC 3745-1-05(C)(6)(c) and OAC 3745-1-54).

1. Minimal Degradation Alternative (Selected Alternative)

A discussion of the overall value and quality of water resources impacted by the Minimal Degradation (Selected) Alternative (Crooked Creek, Pee Pee Creek, Wetlands 1, 4, 6, 8, 9 and 10, and Lake White) is presented in Block 10b. As documented in the PIK-104-10.64 Level 2 Categorical Exclusion, the proposed project is expected to have some impact (positive and negative) on human health related to safety, air quality, noise, and drinking water resources. Information concerning these impacts is summarized below.

Safety - The Lake White Dam is classified by ODNR as Class 1 Dam, meaning it has a total storage volume greater than five thousand acre-feet and significant damage and probable loss of life would occur downstream in the event of a failure. Since the dam is a Class 1 structure, it must safely pass the Probable Maximum Flood (PMF). Hydraulic analyses have shown that the dam's spillway is unable to pass the PMF, and a less than 10% PMF 72-hour storm will cause overtopping of the dam embankment. Additionally, a 72-hour PMF event would overtop the dam by an average of 4.6 feet with a peak discharge of 96,466 cubic feet per second. Previous floods that have overtopped the dam and SR 104 have resulted in numerous erosion rills along the east slope of the dam. Over time, such erosion can reduce the structural integrity of the dam. Seepage has also been observed along the east embankment of the dam near SR 551. Seepage of this nature is evidence of embankment problems which can compromise the dam's structural integrity. Finally, a substantial amount of scour has occurred along Crooked Creek immediately below the dam. Crooked Creek is an incised alluvial channel, likely channelized at the time of road or dam construction, which results in an unstable stream. The stream is disconnected from its historic floodplain and experiences elevated channel velocities and shear stresses during flood events which lead to accelerated bed and bank erosion. Scour and erosion along the toe of the embankment can also weaken the dam.

According to ODOT's current Bridge Inventory Report, the existing structure over the dam spillway has a Sufficiency Rating of 47.9 and a General Appraisal Rating of 4, which indicate deteriorated conditions and the need for improvements. Additionally, SR 104 in the project area currently has 11-foot wide travel lanes and 3-foot wide shoulders. Current design standards require 12-foot wide travel lanes, with 8-foot paved shoulders and 12-foot wide graded shoulders. Currently, there are no turn lanes on any approach to the SR 551 and SR 552 intersections. Both intersections are two-way stop controlled with stop signs on SR 551 and SR 552. A turn lane analysis determined that a southbound right-turn lane is warranted on SR 104 at both intersections. The analysis also determined that a northbound left turn lane is warranted on SR 104 at the SR 552 intersection. The SR 552 intersection is also in need of improvement due to a lack of visibility experienced by vehicles turning left from SR 552 onto SR 104. Finally, field observations indicate pavement deterioration on SR 104 on Lake White Dam. This pavement deterioration was determined to be most likely due to dam embankment deterioration and flood waters overtopping the dam and SR 104.

The PIK-104-10.64 project is not expected to result in any safety issues during construction of the Minimal Degradation (Selected) Alternative. During construction, the water elevation of the lake will be lowered to an elevation of 564', which will not only allow for construction work to be performed in Lake White, but will also reduce stress on the dam during construction and provide storage capacity should a heavy rain event occur. Once construction is complete, several serious safety/human health concerns will be addressed for the long term, including structural integrity of the Class I Lake White Dam, the deteriorated SR 104 bridge over the dam spillway, and the deficient roadway conditions on SR 104. Though two streams, six wetlands, and Lake White will be impacted by the PIK-104-10.64 project under the Minimal Degradation (Selected) Alternative, the overall impact to water resources is considered minor in comparison to need to address these issues. However, as described in at the start of 401 Block 10, substantial effort has been directed toward avoidance and

minimization of environmental impacts throughout the development of this project, and mitigation is proposed for unavoidable fill impacts to streams and wetlands in the project area.

Maintenance of Traffic - During construction, through traffic on SR 104 will be detoured around the project area via US 23, which is a four-lane facility that parallels SR 104 to the east. Detoured traffic on US 23 can access SR 104 at Waverly to the north of the project, or via SR 32 near Piketon to the south of the project. Locally, SR 104 will be closed to traffic in the project area. However, the contractor must keep either the SR 104/SR 551 intersection or the SR 104/SR 552 intersection open to traffic at all times to allow for access to residences around Lake White and emergency services (police, fire, ambulance). These local intersection closures and detours will likely result in a several minute increase in emergency response time in the project area.

Air Quality - Pike County is in attainment for all National Ambient Air Quality Standards (NAAQS) for Particulate Matter (PM₁₀ and PM_{2.5}), carbon monoxide, and ozone. The PIK-104-10.64 project is located in a rural area and due to the relatively low traffic volumes on SR 104, SR 551, and SR 552, there are currently no air quality issues or concerns in the project area. The Minimal Degradation (Selected) Alternative will not add new access points or add traffic capacity (additional through lanes) and is not expected to cause land use changes or development that could result in increased traffic volumes or changes in vehicle mix. Consequently, this project is not expected to have any meaningful effect on mobile source air toxic (MSATs). This project has met the statutory requirements of the Clean Air Act and is exempt from a PM_{2.5} hot-spot analysis and no carbon monoxide studies are required. Air quality impacts during construction due to equipment operation/emissions are expected to be minor, and dust control measures are required per *ODOT's Construction and Materials Specifications (2013)*. Though fugitive dust is expected to increase during construction in the immediate project area, equipment operation will be temporary and sporadic in nature, and will take place in a rural area where there are no immediately adjacent residences or other sensitive receptors downwind of the project (with respect to the prevailing wind direction).

Noise - The Minimal Degradation (Selected) Alternative will not cause an increase in traffic volumes, will not substantially change vehicle mix or speed, will not involve new roadways or additional roadway capacity, and will not substantially change the existing roadway alignment. Therefore a noise analysis was not required the project. Construction of the PIK-104-10.64 project is expected to result in some short-term, localized increases in construction noise levels, as construction activities may take place outside traditional working hours (early morning/evening) due to tight schedule constraints with regard to lake drain and roller compacted concrete construction and the lowering of water levels in Lake White. However, ODOT will require the contractor adhere to local noise abatement and control requirements (if applicable) and that all construction equipment be fitted with appropriate mufflers, shields, and/or enclosures to minimize engine noise.

Hazardous Materials - An Environmental Site Assessment Screening conducted for the PIK-104-10.64 project did not identify any potential hazardous materials sites in the project vicinity that may be disturbed or may otherwise have an adverse effect on human health and safety. A discussion of drinking water resources in the project area and spill/contamination response is presented below.

Drinking Water Resources - No USEPA-designated sole-source aquifers are located in the vicinity of the Minimal Degradation (Selected) Alternative; however, the Minimal Degradation (Selected) Alternative impact area is located adjacent to the Pike Water Company Drinking Water Source Protection Area and the Flour-B&W Portsmouth Drinking Water Source Protection Area, and partially within the Aqua Ohio-Lake White Public Water System Protection Area. The Aqua Ohio-Lake White Public Water System wells are located along the east side of the SR 104/Lake White Dam embankment, in the middle of the project area. The Minimal Degradation (Selected) Alternative will not impact the wells, and a retaining wall will be constructed along SR 104 to protect the well area from potential future Lake White flood events that overtop SR 104. A plan note has been added to the design plans specifying best management practices for construction work within and adjacent to the source water protection areas and providing emergency contact information in the event of a hazardous material spill.

2. Preferred Alternative

Impacts on human health by the Preferred Alternative will be similar to those associated with the Minimal Degradation (Selected) Alternative, as this alternative will involve construction of the same overall improvements as the Minimal Degradation Alternative. Though the Preferred Alternative will result in more extensive water resource impacts to Pee Pee Creek, Wetland 1, Wetland 4, and Wetland 6, as well as an impact to Wetland 7, the primary design factor involved in the higher water resource impacts (i.e. the 3:1 roller compacted concrete slopes) would not have any substantive additional safety issues or human health impact with regard to maintenance of traffic (detour), air quality, noise, hazardous materials, drinking water resources, or social/economic conditions (see Block 10h).

3. Non-Degradation Alternative

The Non-Degradation (No Build) Alternative involves no improvements to existing SR 104, Lake White Dam, or the SR 104 bridge over the Lake White Dam spillway. This alternative would have no immediate impact on Lake White, Pee Pee Creek, Crooked Creek, wetlands, ponds, terrestrial habitats, threatened and endangered species, or any other project area environmental resources, and would cause no near-term water quality degradation. However, the Non-Degradation Alternative would not address any of the critical Purpose and Need elements described in Block 8a (dam safety, spillway bridge deterioration, SR 104 improvement needs) and therefore could have substantial human health impacts. Implementation of the Non-Degradation Alternative would result in gradual infrastructure deterioration and further dam and transportation safety problems, which would be exacerbated by future flood events and higher traffic volumes. This could potentially result in a catastrophic dam failure which would cause extensive downstream flooding and likely result in the loss of human life. Deteriorating road and bridge conditions and higher traffic volumes would also result in a greater potential for accidents in the Lake White Dam area, including spills of fuels or other hazardous materials which could eventually reach project area surface waters, groundwater, and terrestrial habitats. Consequently, under the Non-Degradation Alternative scenario, impacts to streams, wetlands, and Lake White would be expected in the future due to the continual need for roadway and dam maintenance projects, along with occasional larger-scale emergency projects, in an effort to keep SR 104 open to traffic and to avoid a critical dam failure. The monetary cost of these future maintenance projects and associated the environmental impacts/mitigation would eventually exceed those of the Minimal Degradation (Selected) Alternative, and would likely result in social and economic impacts due to road closures and traffic detours, loss of access to the Lake White State Park area, and an overall decline in attractiveness from a recreation/tourism standpoint. For these reasons, the Non-Degradation Alternative is not considered to be a safe or practicable alternative for the PIK-104-10.64 project, even though near-term water resource/water quality impacts and other environmental impacts associated with this alternative would be minimal.

Block 10h.

Describe and provide an estimate of the important social and economic benefits to be realized through this project. Include the number and types of jobs created and tax revenues generated and a brief discussion of the condition of the local economy. (OAC 3745-1-05(B)(2)(e) and OAC 3745-1-05(C)(6)(i)).

1. Minimal Degradation Alternative (Selected Alternative)

a. Condition of the Local Economy

According to the Office of Policy, Research, and Strategic Planning with the Ohio Development Services Agency (Pike County Profile, 2013), the population of Pike County has steadily increased over the past 50 years with a 2010 census population of 28,709, representing a 3.5 percent increase over the 2000 population level. The largest population

concentration in Pike County is within the village of Waverly (4,406). Land use in Pike County is primarily forest (66%), followed by cropland (23%) and pasture (8%). Total land in farm use in 2010 was 97,446 acres.

Major private sector employment industries of the civilian labor force in 2010 included manufacturing, education and health services, trade, transportation and utilities, professional and business services, leisure and hospitality, and construction, followed by financial services, natural resources and mining, and information (Pike County Profile, 2013). Major employers in Pike County include Eastern Local Schools, Ohio Valley Electric Corporation, Pike Community Hospital, Pike County Government, Pike County JVS, Scioto Valley Local Schools, USEC/United States Enrichment Corp, Wal-Mart Stores, Waverly Care Center, Waverly City Schools, and Western Local Schools. The median household income in Pike County was \$39,735, below the Ohio median household income of \$48,246 in 2013. The 2012 per capita personal income in Pike County was \$31,431, while it was \$40,057 for the state of Ohio.

The Ohio Department of Development and the United States Department of Labor (2013) report that the unemployment rate in Pike County (at that time) was 12.5 percent compared to the Ohio unemployment rate of 7.4 percent and the national rate of 7.5 percent. The United States Environmental Protection Agency online search tool for environmental justice (<http://epamap14.epa.gov/ejmap>) indicates that the 2010 poverty rate for Pike County was 23.6 percent, which is higher than the Ohio average poverty rate of 15.8 percent. As documented in the PIK-104-10.64 Categorical Exclusion, minority and low income rates in project area census block groups range from 2.02 percent to 7.67 percent and 4.3 percent to 23.75 percent, respectively. The Categorical Exclusion also determined that the PIK-104-10.64 project (regardless of alternative) would have no disproportionate and adverse impacts to environmental justice populations (low income, minority), and no environmental justice issues were raised as a result of public involvement activities conducted as part of this project.

b. Economic Benefits Realized

Secondary development resulting from construction of the Minimal Degradation (Selected) Alternative is expected to be minimal. Though the project will improve dam safety and transportation conditions through the project area, the Minimal Degradation (Selected) Alternative will not introduce any new roadways, add roadway capacity (additional through travel lanes), or introduce any new access points, and will not change the overall SR 104 roadway alignment which could potentially spur land use changes and secondary development. Potential economic benefits that may be realized as a result of the Minimal Degradation (Selected) Alternative are briefly described below:

Employment and Business Opportunities - During construction, a slight temporary increase in construction-related sales and temporary job opportunities may occur as a result of the project. Local establishments that could potentially benefit from this slight increase in construction-related business, or may need additional short-term employees, include local eateries, service stations, equipment sales/rentals, and other businesses offering construction-related goods and services. Following construction of the Minimal Degradation (Selected) Alternative, no substantial long-term employment or income benefits are anticipated. Though no specific employment studies have been conducted for this project, rehabilitation of the Lake White dam and a safer, more efficient stretch of rural two lane highway across the dam is not likely to make the SR 104 corridor or the Lake White/Waverly area substantially more attractive from a long-term business, employment, or residential/quality of life standpoint. However, a safer dam and an improved SR 104 facility, along with the proposed Section 4(f) improvements to Lake White State Park, could have some to benefit local recreation/tourism, and could also benefit local property values (see below), though these positive effects are not expected to be substantial.

Property Values / State and Local Tax Revenues - The Minimal Degradation (Selected) Alternative is expected to result in an initial loss of tax revenue due to the conversion of a small amount of private land area (approximately one acre) into State of Ohio right-of-way and a minor loss of tourism due to temporary impacts to recreational opportunities in the Lake White State Park area. However, since the majority of the Minimal Degradation (Selected) Alternative is confined to

existing ODOT right-of-way and ODNR property, and the impacts to recreational opportunities will be temporary and will be mitigated (see Recreational Opportunities below), the overall tax revenue loss will be negligible. As described above, construction of the Minimal Degradation (Selected) Alternative is not expected to have any substantial secondary development or long-term business/employment effects. The Minimal Degradation (Selected) Alternative is also not expected to have a substantial effect on property or housing values or the availability of property/housing in the project vicinity; however, it is possible that a safer dam, an improved SR 104 facility across the dam, and improvements to Lake White State Park could have some minor, long-term benefit to local property/housing values and recreation/tourism, which could provide additional tax revenue and offset any revenues lost from the conversion of private land to state right-of-way.

Recreational Opportunities - As discussed above, the Minimal Degradation (Selected) Alternative will provide a safer Lake White dam and an improved SR 104 facility across the dam. These improvements, in conjunction with proposed Section 4(f) improvements to Lake White State Park (approximately \$500,000 for rest room, parking lot, boat ramp/dock, activity building, and playground improvements), are expected to enhance the attractiveness of Lake White State Park from a recreational standpoint. Furthermore, construction of an access drive on the north side of the Lake White Dam spillway to an existing ODNR property is part of an ODNR plan to improve public recreational access to Pee Pee Creek and the Scioto River (for hiking, canoeing, etc.). Though construction of the Minimal Degradation (Selected) Alternative will temporarily disrupt boat access to Lake White (due to low water levels) and public fishing in Pee Pee Creek below the spillway, these recreational opportunities will be available again upon completion of the project.

c. Social Benefits Realized

The Minimal Degradation (Selected) Alternative for the PIK-104-10.64 project will be constructed on existing alignment and primarily within existing right-of-way; therefore it will not separate or sever any community nor will it isolate any residential or business activity. Though the project will not result in any major direct social benefits, proposed transportation improvements along SR 104 will benefit local and regional accessibility, traffic flow and safety. Furthermore, a rehabilitated Lake White dam, an improved SR 104 facility across the dam, proposed Section 4(f) improvements to Lake White State Park, and construction of an access drive on the north side of the Lake White Dam spillway to an existing ODNR property will improve recreational opportunities and could improve the overall attractiveness of the area from a tourism standpoint, which could have some minor, long-term social and economic benefits to the Lake White/Waverly area.

From an aesthetic standpoint, the PIK-104-10.64 Minimal Degradation (Selected) Alternative will be constructed on existing alignment and primarily within the existing right-of-way. In some respects, new bridge, dam, and roadway facilities located within existing right-of-way and adjacent to a lake that was constructed (and is used) for recreational and residential purposes could be considered an aesthetic improvement - replacing old, cracked, weathered, and deteriorated concrete, asphalt, and steel. No new bridge or dam structures, roadways, or access points will be introduced in any area that is not currently occupied by bridge, dam, or roadway facilities owned by the State of Ohio. The Minimal Degradation (Selected) Alternative design does not involve any major vertical grade changes that will drastically change the current visual landscape, and no substantive post-construction land use changes are anticipated that will either benefit or adversely impact the overall aesthetics of the area.

2. Preferred Alternative

The social and economic benefits of the Preferred Alternative will be similar to those associated with the Minimal Degradation (Selected) Alternative, as this alternative will involve construction of the same overall improvements as the Minimal Degradation Alternative. Though the Preferred Alternative will result in more extensive water resource impacts to Pee Pee Creek, Wetland 1, Wetland 4, and Wetland 6, as well as an impact to Wetland 7, the primary design factor

involved in the higher water resource impacts (i.e. the 3:1 roller compacted concrete slopes) would not result in any substantive additional social or economic benefit (or impact). The Preferred Alternative would have some additional impact on Lake White State Park recreation areas along SR 104 and SR 551, though this additional impact would be offset by additional Section 4(f) mitigation. The Preferred Alternative, however, will cost the State of Ohio approximately \$1.3 million more to construct than the Minimal Degradation (Selected) Alternative, due (in part) to slightly higher costs for earthwork and additional roller compacted concrete.

3. Non-Degradation Alternative

No overall social or economic benefits are expected with the Non-Degradation (No Build) Alternative. As previously discussed, this alternative involves no improvements to existing SR 104, Lake White Dam, or the SR 104 bridge over the Lake White Dam spillway, and would not address any of the critical Purpose and Need elements described in Block 8a (dam safety, spillway bridge deterioration, SR 104 improvement needs). Implementation of the Non-Degradation Alternative would result in gradual infrastructure deterioration and further dam and transportation safety problems, which would be exacerbated by future flood events and higher traffic volumes. This could potentially result in a catastrophic dam failure which would cause extensive downstream flooding and likely result in the loss of human life. Deteriorating road and bridge conditions and higher traffic volumes would also result in a greater potential for accidents in the Lake White Dam area, including spills of fuels or other hazardous materials. Consequently, under the Non-Degradation Alternative scenario, impacts to streams, wetlands, and Lake White would be expected in the future due to the continual need for roadway and dam maintenance projects, along with occasional larger-scale emergency projects, in an effort to keep SR 104 open to traffic and to avoid a critical dam failure. The monetary cost of these future maintenance projects and the associated environmental impacts/mitigation would eventually exceed those of the Minimal Degradation (Selected) Alternative, and would likely result in social and economic impacts due to road closures/traffic detours, loss of access to the Lake White State Park area, and an overall decline in attractiveness from a recreation/tourism standpoint. For these reasons, the Non-Degradation Alternative is not considered to be a safe or practicable alternative for the PIK-104-10.64 project, even though near-term water resource/water quality impacts and other environmental impacts associated with this alternative would be minimal.

Block 10i.

Describe and provide an estimate of the important social and economic benefits that may be lost as a result of this project. Include the effect on commercial and recreational use of the water resource, including effects of lower water quality on recreation, tourism, aesthetics, or other use and enjoyment by humans. (OAC 3745-1-05(B)(2)(e, f) and OAC 3745-1-05(C)(6)(e)).

1. Minimal Degradation Alternative (Selected Alternative)

a. Economic Benefits Lost

Overall, no substantive economic benefits are expected to be lost as a result of the Minimal Degradation (Selected) Alternative. Economic losses associated with the project include a potential small loss of tax revenues and a minor, temporary loss of recreational opportunities/tourism due to maintenance of traffic (detour) and construction activities in Lake White and Pee Pee Creek. Further discussion of economic benefits lost is presented below.

Economic/Employment Opportunities Lost - No businesses will be directly impacted or displaced due to construction of the Minimal Degradation (Selected) Alternative and no active farmland will be converted to State of Ohio right-of-way; however, there could be a small temporary decrease in tourism/recreational business in the Lake White/Waverly area during construction due to the SR 104 detour around the project area and the lowering of the water level in Lake White,

which will temporarily affect recreational opportunities associated with Lake White State Park. This potential loss could be partially offset by a minor, longer-term increase in recreation/tourism after construction. A slight increase in temporary construction-related sales and temporary job opportunities may occur as a result of the project, though the overall net loss/gain is not expected to be substantial. As previously discussed, construction of the Minimal Degradation (Selected) Alternative is not expected to result in any secondary development or make the project area substantially more or less attractive to commercial and residential growth. However, a rehabilitated dam and an improved SR 104 facility, along with the proposed Section 4(f) improvements to Lake White State Park and the proposed access drive to an existing ODNR property, could have some long-term benefit to local recreation/tourism, and could also benefit local property values (see below), though overall, these positive effects are also not expected to be substantial.

Property Values/State and Local Tax Revenues Lost - No residential property impacts or displacements will occur due to construction of the Minimal Degradation (Selected) Alternative. As previously discussed, the Minimal Degradation (Selected) Alternative is expected to result in an initial loss of tax revenue due to the conversion of a small amount of private land into State of Ohio right-of-way and a minor loss of tourism due to temporary impacts to recreational opportunities in the Lake White State Park area. However, since the majority of the Minimal Degradation (Selected) Alternative is confined to existing ODOT right-of-way and ODNR property, and the impacts to recreational opportunities will be temporary and will be mitigated, the overall tax revenue loss will be negligible. Construction of the Minimal Degradation (Selected) Alternative is not expected to have any substantial secondary development or long-term business/employment effects (positive or negative). The Minimal Degradation (Selected) Alternative is also not expected to have a substantial effect on property or housing values or the availability of property/housing in the project vicinity; however, it is possible that a rehabilitated dam, an improved SR 104 facility across the dam, and recreational improvements to Lake White State Park could provide a minor, long-term benefit to local property/housing values and recreation/tourism, which could provide some additional tax revenue to offset any revenue lost from the conversion of private land to state right-of-way or the temporary loss of tourism revenue during construction.

b. Social Benefits Lost

No substantial loss of social benefits is expected as a result of the Minimal Degradation (Selected) Alternative. Some temporary community impacts could occur in the Lake White area due to maintenance of traffic requirements (temporary minor detours). Emergency services (police, fire, ambulance) will be maintained at all times during construction to the project area via the proposed local detour routes (around Lake White on SR 551 and SR 552). However, the local detour routes around Lake White will likely result in a several minute increase in response time. Otherwise, no substantial accessibility impacts or other social impacts are expected. The Minimal Degradation (Selected) Alternative will be constructed primarily on existing alignment and within existing right-of-way; therefore it will not separate or sever any community nor will it isolate any residential or business activity. No long-term impacts to community cohesion or aesthetics are expected, and once construction of the PIK-104-10.64 project is complete, the SR 104 corridor and Lake White area will experience improved accessibility and safety.

Construction activities around Lake White/Lake White State Park area, including the lowering of the water level in Lake White, is expected to have a short-term impact on recreational opportunities such as boating, fishing, and swimming. Public fishing is popular in Lake White, as well as in Pee Pee Creek below the Lake White Dam spillway, and these recreational opportunities will be temporarily lost (or substantially disrupted) during construction. Construction areas will be off-limits to recreational use, and lower water levels will make boat access to Lake White more difficult. Additionally, sport fish will likely vacate the impact areas until construction ceases and water levels return to normal. The duration of this impact is expected to be one full construction season (approximately 6-8 months). Once construction is complete, recreational opportunities in the Lake White area will be restored, and to some extent enhanced by the proposed recreational improvements to Lake White State Park (Section 4(f) mitigation) and ODNR's plan to provide improved access to Pee Pee Creek and the Scioto River through construction of an access drive to ODNR property along Pee Pee Creek north of the Lake White Dam spillway.

2. Preferred Alternative

The social and economic benefits lost for the Preferred Alternative will be similar to those associated with the Minimal Degradation (Selected) Alternative, as this alternative will involve the same overall improvements as the Minimal Degradation Alternative. Though the Preferred Alternative will result in more extensive water resource impacts to Pee Pee Creek, Wetland 1, Wetland 4, and Wetland 6, as well as **an impact to Wetland 7**, the primary design factor involved in the higher water resource impacts (i.e. the 3:1 roller compacted concrete slopes) would not result in any substantive additional social or economic benefit (or loss). The Preferred Alternative would have some additional impact on Lake White State Park recreation areas along SR 104 and SR 551, though this additional impact would be offset by additional Section 4(f) mitigation. The Preferred Alternative, however, would cost the State of Ohio approximately \$1.3 million more to construct than the Minimal Degradation (Selected) Alternative, due (in part) to slightly higher costs for roadway/earthwork and additional roller compacted concrete.

3. Non-Degradation Alternative

The Non-Degradation (No Build) Alternative involves no improvements to existing SR 104, Lake White Dam, or the SR 104 bridge over the Lake White Dam spillway. This alternative would have no immediate impact on Lake White, Pee Pee Creek, Crooked Creek, wetlands, ponds, terrestrial habitats, threatened and endangered species, or any other project area environmental resources, and would cause no near-term water quality degradation. However, the Non-Degradation Alternative would have no social or economic benefits, and the potential for social and economic losses are substantial. The Non-Degradation Alternative would not address any of the critical Purpose and Need elements described in Block 8a (dam safety, spillway bridge deterioration, SR 104 improvement needs) and, therefore, could have substantial human health impacts. Implementation of the Non-Degradation Alternative would result in gradual infrastructure deterioration and further dam and transportation safety problems, which would be exacerbated by future flood events and higher traffic volumes. This could potentially result in a catastrophic dam failure which would cause extensive downstream flooding and likely result in the loss of human life. Deteriorating road and bridge conditions and higher traffic volumes would also result in a greater potential for accidents in the Lake White Dam area, including spills of fuels or other hazardous materials which could eventually reach project area surface waters, groundwater, and terrestrial habitats. Consequently, under the Non-Degradation Alternative scenario, impacts to streams, wetlands, and Lake White would be expected in the future due to the continual need for roadway and dam maintenance projects, along with occasional larger-scale emergency projects, in an effort to keep SR 104 open to traffic and to avoid a critical dam failure. The monetary cost of these future maintenance projects and associated environmental impacts/mitigation would eventually exceed those of the Minimal Degradation (Selected) Alternative, and would likely result in social and economic impacts due to road closures and traffic detours, loss of access to the Lake White State Park area, and an overall decline in attractiveness from a recreation/tourism standpoint. For these reasons, the Non-Degradation Alternative is not considered to be a safe or practicable alternative for the PIK-104-10.64 project, even though near-term water resource/water quality impacts and other environmental impacts associated with this alternative would be minimal.

Block 10j.

Describe environmental benefits, including water quality, lost and gained as a result of this project. Include the effects on the aquatic life, wildlife, threatened or endangered species. (OAC 3745-1-05(B)(2)(e, f) and OAC 3745-1-05(C)(6)(b) and 3745-1-54).

1. Minimal Degradation Alternative (Selected Alternative)

Environmental benefits lost as a result of the Minimal Degradation (Selected) Alternative are described in detail in Block 10b of this Antidegradation Evaluation. In general, environmental benefits lost consist of: 1) new impact to 1,340 linear

feet of stream channel (Pee Pee Creek and Crooked Creek, excluding existing concrete spillway area), 2) impact to **0.374 acre** of moderate-quality Category 2 non-isolated wetland (Wetlands 1, 4, 6, 8, 9, and 10), 3) impact to 2.703 acres of a jurisdictional lake (Lake White), and 4) loss of approximately 3.8 acres of forested habitat, including 10 potential bat summer roost trees. Construction activities around Lake White/Lake White State Park, including the lowering of the water level in Lake White, are expected to have a temporary impact on recreational opportunities such as boating, fishing, and swimming. Public fishing is popular in Lake White, as well as in Pee Pee Creek below the Lake White Dam spillway, and these recreational opportunities will be temporarily lost (or substantially disrupted) during construction. Construction areas will be off-limits to recreational use, and lower water levels will make boat access to Lake White more difficult. Additionally, sport fish will likely vacate the impact areas until construction ceases and water levels return to normal. The duration of this impact is expected to be one full construction season (approximately 6-8 months).

Environmental benefits gained as a result of the Minimal Degradation (Selected) Alternative include construction of on-site Crooked Creek mitigation (1,070-foot relocation/restoration using natural stream design techniques) and mitigation of remaining stream impacts due to permanent fill activities at an off-site location (1.5:1 ratio). Since Crooked Creek is currently an incised, unstable stream channel that is eroding the SR 104/Lake White Dam embankment, construction of a new natural stream channel with a better floodplain connection will improve overall water quality in Crooked Creek and its receiving water – Pee Pee Creek. Environmental benefits also include mitigation of wetland impacts at an off-site location (at 2:1 and 2.5:1 ratios). Overall, the proposed mitigation for the Minimal Degradation Alternative (see Block 10k) will result in a net increase in stream channel length and wetland area created, restored and/or preserved. In addition, the relocation/restoration of Crooked Creek includes a plan to restore approximately three acres of floodplain forest on ODNR property in the Crooked Creek/Pee Pee Creek floodplain. The Minimal Degradation (Selected) Alternative will also provide safer and more efficient travel through the project area, will reduce the risk of a catastrophic dam failure/flooding, and will lower the potential for an accidental spill/hazardous materials release into streams, wetlands, Lake White, groundwater, and terrestrial habitats. The Minimal Degradation (Selected) Alternative will also improve long-term recreational opportunities in the project area due to Section 4(f) mitigation plans in the Lake White State Park area and the proposed access drive to ODNR property along Pee Pee Creek north of the spillway. Consequently, construction of the Minimal Degradation (Selected) Alternative is expected to have no adverse long-term adverse effect on aquatic life, terrestrial wildlife, water quality, threatened and endangered species, or recreational opportunities associated with aquatic/terrestrial wildlife and water quality.

2. Preferred Alternative

Environmental benefits lost as a result of the Preferred Alternative are presented in Block 10b of this Antidegradation Evaluation and are more extensive than the Minimal Degradation (Selected) Alternative. In general, environmental benefits lost consist of: 1) new impact to 1,370 linear feet of stream channel (Pee Pee Creek and Crooked Creek, excluding existing concrete spillway area), 2) impact to **0.690 acre** of moderate-quality Category 2 non-isolated wetland (Wetlands 1, 4, 6, 7, 8, 9, and 10), 3) impact to 2.703 acres of a jurisdictional lake (Lake White), and 4) loss of approximately 5.4 acres of forested habitat, including 10 potential bat summer roost trees. Similar to the Minimal Degradation (Selected) Alternative, construction activities around Lake White/Lake White State Park, including the lowering of the water level in Lake White, are expected to have a temporary impact on recreational opportunities such as boating, fishing, and swimming.

Environmental benefits gained as a result of the Preferred Alternative are similar to the Minimal Degradation (Selected) Alternative, and include construction of on-site Crooked Creek mitigation (1,070 foot relocation/restoration using natural stream design techniques) and mitigation of remaining stream impacts due to permanent fill activities at an off-site location (1.5:1 ratio). Environmental benefits also include mitigation of wetland impacts at an off-site location (at 2:1 and 2.5:1 ratios). Overall, the proposed mitigation for the Preferred Alternative (see Block 10k) would result in a net increase in stream channel length and wetland area created, restored and/or preserved. In addition, the relocation/restoration of Crooked Creek includes a plan to restore approximately three acres of floodplain forest on ODNR property in the Crooked

Creek/Pee Pee Creek floodplain. Similar to the Minimal Degradation (Selected) Alternative, the Preferred Alternative would also provide safer and more efficient travel through the project area, would reduce the risk of catastrophic dam failure/flooding, and would lower the potential for an accidental spill/hazardous materials release into streams, wetlands, or Lake White. Though the Preferred Alternative would have a greater impact on Lake White State Park recreational areas, the Preferred Alternative would be expected to result in an overall improvement in recreational opportunities in the project area due to the additional Section 4(f) mitigation that would be required.

3. Non-Degradation Alternative

The Non-Degradation (No Build) Alternative involves no improvements to existing SR 104, Lake White Dam, and the SR 104/Lake White Dam spillway bridge. However, implementation of this alternative would not address critical dam condition/safety issues, spillway bridge deterioration problems, and SR 104 roadway and intersection safety needs. Consequently, this alternative would result in continued infrastructure deterioration and further transportation safety problems, which would be exacerbated by future flood events and gradually increasing traffic volumes. The ecological benefits of this alternative are minimal, and primarily involve no immediate impact on Lake White, Pee Pee Creek, Crooked Creek, wetlands, terrestrial habitats, or any other project area environmental resources, and no near-term mitigation needs. The Non-Degradation Alternative would also have no social or economic benefits. However, the potential for future social, economic, and ecological/water quality losses are substantial. Implementation of the Non-Degradation Alternative could potentially result in a dam failure which would cause extensive downstream flooding and likely result in the loss of human life. A catastrophic event of this nature would have extraordinary social, economic, and ecological consequences. Additionally, deteriorating road and bridge conditions and higher traffic volumes would also result in a greater potential for accidents in the Lake White Dam area, including spills of fuels or other hazardous materials which could eventually reach project area surface waters, groundwater, and terrestrial habitats. Consequently, under the Non-Degradation Alternative scenario, impacts to streams, wetlands, Lake White, and other environmental resources would be expected in the future due to the continual need for roadway and dam maintenance projects, along with occasional larger-scale emergency projects, in an effort to keep SR 104 open to traffic and to avoid a critical dam failure. The monetary cost of these future maintenance projects and associated environmental impacts/mitigation would eventually exceed those of the Minimal Degradation (Selected) Alternative, and would likely result in social and economic impacts due to road closures/traffic detours, loss of access to the Lake White State Park area, and an overall decline in attractiveness from a recreation/tourism standpoint. Consequently, the Non-Degradation Alternative is not considered to be a safe or practicable alternative for the PIK-104-10.64 project.

Block 10k.

Describe mitigation techniques proposed (except for the Non-Degradation Alternative):

- Describe proposed Wetland Mitigation (see OAC 3745-1-54 and Primer)
- Describe proposed Stream, Lake, Pond Mitigation (see Primer)

1. Minimal Degradation Alternative (Selected Alternative)

a. Summary of Impacts and Proposed Mitigation

As summarized in Block 10b, Tables C1, C2 and C3, and Exhibits 4-12, the Minimal Degradation (Selected) Alternative for the PIK-104-10.64 project is expected to impact 1,442 total feet of stream channel (including spillway impacts), 0.374 acre of non-isolated wetland, and 2.703 acres of a jurisdictional lake. Impacted streams include Pee Pee Creek and Crooked Creek in the Scioto River drainage. Impacted wetlands include Wetlands 1, 4, 6, 8, 9, and 10 in the Scioto River drainage. The jurisdictional lake impacted by the project is Lake White, which formed as a result of dam construction across the Pee

Pee Creek channel. Physical and biological characteristics for the impacted streams, wetlands, and Lake White are included in Tables A, B1, and B2. Photographs of impacted features are presented in Appendix C. A summary of impacts by feature is presented below:

• Pee Pee Creek (OEPA Warmwater Habitat)	327 feet
• Crooked Creek (OEPA Warmwater Habitat)	1,115 feet
• Wetland 1 (Category 2)	0.024 acre
• Wetland 4 (Modified Category 2)	0.038 acre
• Wetland 6 (Category 2)	0.140 acre
• Wetland 8 (Category 2)	0.042 acre
• Wetland 9 (Category 2)	0.090 acre
• Wetland 10 (Category 2)	0.040 acre
• Lake White (OEPA Exceptional Warmwater Habitat)	2.703 acres

Proposed Mitigation Strategy and Justification

The proposed mitigation strategy for the PIK-104-10.64 Minimal Degradation (Selected) Alternative is as follows: 1) mitigate impacts to 1,070 feet of Crooked Creek on-site at a 1:1 ratio through Crooked Creek relocation using natural channel design techniques; 2) mitigate remaining stream impacts at the Sunday Creek Coal Company (SCCC) pooled mitigation area; and 3) mitigate impacts to wetlands at the Redstone Farm mitigation bank. The proposed mitigation strategy has been developed in accordance with OAC 3745-1 and the USACE's 2008 Final Mitigation Rule. All aspects of the proposed mitigation strategy are located within the same watershed (05060002) as the impacted sites, or in an adjacent watershed, and are located where they are most likely to replace lost aquatic resource functions.

The unavoidable and permanent loss of 1,090 feet of Crooked Creek channel is the Minimal Degradation (Selected) Alternative's most substantial water resource impact. There are no stream mitigation banks or ODOT pooled mitigation sites in the 05060002 watershed. There are also no mitigation sites in adjacent watersheds that serve 05060002 with enough credits to mitigate this impact at a 1.5:1 off-site ratio. However, early in the development of the PIK-104-10.64 project, ODOT and ODNR recognized an opportunity to mitigate the Crooked Creek impact on-site (on ODNR property) using a watershed approach. Though Crooked Creek is designated as a Warmwater Habitat, it is listed as being in an impaired watershed as determined under Section 303(d) of the Federal Water Pollution Control Act, 33 USC. Section 1313(d). Crooked Creek is also listed on the 2012 Section 303(d) Draft List of Prioritized Impaired Waters. In the project area, Crooked Creek is an unstable stream channel, and is actively eroding the SR 104/Lake White Dam embankment. The channel is also incised, and has lost normal floodplain connection. The proposed 1,070 foot Crooked Creek relocation/restoration will use natural stream design techniques to restore the aquatic functions once provided by Crooked Creek in the project area. Utilization of natural stream design techniques will improve in-stream aquatic habitat, and restore appropriate channel dimension, pattern, and profile for this stream, which will reduce shear stress, scour and erosion and improve water quality. The Crooked Creek relocation will also restore approximately three acres of forested floodplain adjacent to the relocated channel, which will provide improved terrestrial riparian habitat. Finally, improved hydrologic connection to the adjacent floodplain will provide better flood control and will improve the functional benefits provided by adjacent wetlands – namely Wetland 8, which is a 3.0 acre floodplain wetland that is located between Pee Pee Creek and the proposed relocated Crooked Creek channel. ODOT proposes this on-site stream relocation/restoration plan since it satisfies 332.3 (b)(4), *Permittee-Responsible Mitigation under a Watershed Approach* under the 2008 Final Mitigation Rule.

Immediately below the Lake White Dam spillway, the Minimal Degradation (Selected) Alternative will impact 90 feet of Pee Pee Creek through a combination of permanent and temporary fill impacts. Permanent impacts primarily involve concrete wingwall construction and placement of rock channel protection around the wingwalls. This impact is only along the banks of Pee Pee Creek (not the entire OHWM channel). Temporary equipment access will occur in this area during construction, as well as the expected placement of temporary rock channel protection across the OHWM channel to provide a stable equipment crossing location. At the downstream end of the proposed Crooked Creek relocation/restoration, the Minimal Degradation (Selected) Alternative will impact 135 feet of Pee Pee Creek through a combination of permanent and temporary fill impacts. Permanent impacts primarily involve embankment grading/earthen fill where the relocated Crooked Creek channel ties into Pee Pee Creek. This impact is only along the north bank of Pee Pee Creek (not the entire OHWM channel). Temporary equipment access will likely occur in Pee Pee Creek in this area during construction, as well as the placement of temporary rock channel protection within the OHWM channel for flow diversion purposes. There are no stream mitigation banks or ODOT pooled mitigation areas within the 0506002 watershed. Therefore, ODOT proposes that the 90 foot and 135 foot Pee Pee Creek impacts, the remaining 20 feet of permanent impact to Crooked Creek, and 25 feet of temporary impact to Crooked Creek at the upstream end of the proposed relocation/restoration (270 feet total) be mitigated off-site at the SCCC pooled mitigation area, which is adjacent to and serves the 05060002 watershed. Additionally, no other on-site stream mitigation opportunities are available on the ODNR property, and the majority of the adjacent property is under a USDA conservation easement, which precludes placement of a stream mitigation easement. At a 1.5:1 ratio, 406 feet of Class II and Class III Primary Headwater Habitat stream credit will be deducted from SCCC. While ODOT recognizes that mitigating Warmwater Habitat impacts with Primary Headwater Habitat stream credits is not optimal, it is justifiable given the current impaired status of Crooked Creek and Pee Pee Creek, the overall higher quality of stream available at SCCC, and the 1.5:1 mitigation ratio. ODOT suggests that this approach satisfies 332.3 (b)(6) Permittee-Responsible Mitigation Through Off-Site and/or Out-of-Kind Mitigation under the 2008 Final Mitigation Rule.

The Minimal Degradation (Selected) Alternative will impact 0.374 acre of moderate quality Category 2 wetland. ODOT reviewed the potential for on-site wetland mitigation as part of the Crooked Creek relocation and adjacent floodplain restoration, however, there are engineering concerns with regard to the soils in the area and the long-term success of wetland construction in this area. No other on-site wetland mitigation opportunities are available on the ODNR property, and the majority of the adjacent property is under a USDA conservation easement, which precludes placement of a wetland mitigation easement. Therefore, ODOT proposes that wetland impacts be mitigated off-site at a 2:1 and 2.5:1 ratio (per OAC 3745-1-54) at the Redstone Farm mitigation bank, which is an IRT-approved bank adjacent to and serving the 05060002 watershed. This approach satisfies 332.3 (b)(2) Mitigation Bank Credits under the USACE 2008 Mitigation Rule. The total wetland credits to be used for this mitigation will be 0.781 acre.

No compensatory mitigation is proposed for jurisdictional Lake White impacts, which are considered to be minor overall, and will not result in a loss of aquatic resource function or an overall lowering of water quality. Additionally, ODOT is not proposing compensatory mitigation for the 102 feet of impact to Pee Pee Creek within the existing spillway. At this location, the proposed permanent fill is confined to a permanently modified, concrete spillway area and will not result in a temporary or permanent loss of aquatic resource function or an overall lowering of water quality. The following table summarizes the mitigation plan proposed by ODOT for impacts to streams and wetlands by the Minimal Degradation (Selected) Alternative (see also Table H).

Minimal Degradation (Selected) Alternative - Proposed Mitigation

Resource	Impact Type	Total Impact to Mitigate (feet or acre)	On Site or Off Site	Ratio	Proposed Mitigation Site	Mitigation Applied
Pee Pee Creek	80 feet of overlapping permanent and temporary fill impacts + 10 feet of additional temporary fill impact below spillway	90 feet	Off Site	1.5:1	SCCC***	135 feet
Pee Pee Creek (No Mitigation Proposed)*	Permanent fill impacts within existing concrete spillway	102 feet*	NA	NA	NA	NA
Pee Pee Creek	110 Feet of permanent fill impacts and 55 feet of partially overlapping temporary fill impacts at Crooked Creek relocation (downstream end)	135 feet	Off Site	1.5:1	SCCC***	203 feet
Crooked Creek	Permanent fill and channel relocation	1,070 feet	On Site	1:1	Crooked Creek Relocation	1,070 feet
Crooked Creek	Permanent fill and channel relocation	20 feet	Off Site	1.5:1	SCCC***	30 feet
Crooked Creek	Temporary fill impact at Crooked Creek relocation (upstream end)	25 feet	Off Site	1.5:1	SCCC***	38 feet
MITIGATION TOTAL (STREAMS)		1,340 feet*				1,476 feet
Wetland 1 (Forested – Category 2)	Permanent fill and permanent non-fill vegetation removal impacts	0.024 acre	Off Site	2.5:1	Redstone Farm Bank	0.060 acre
Wetland 4 (Scrub-Shrub – Category 2)	Permanent fill and permanent non-fill vegetation removal impacts	0.038 acre	Off Site	2:1	Redstone Farm Bank	0.076 acre
Wetland 6 (Scrub-Shrub – Category 2)	Permanent fill and permanent non-fill vegetation removal impacts	0.140 acre	Off Site	2:1	Redstone Farm Bank	0.280 acre
Wetland 8 (Forested – Category 2)	Permanent fill and permanent non-fill vegetation removal impacts	0.042 acre	Off Site	2.5:1	Redstone Farm Bank	0.105 acre
Wetland 9 (Emergent – Category 2)	Permanent (indirect) loss of hydrology	0.090 acre	Off Site	2:1	Redstone Farm Bank	0.180 acre
Wetland 10 (Scrub-Shrub – Category 2)	Permanent fill impact	0.040 acre	Off Site	2:1	Redstone Farm Bank	0.080 acre
MITIGATION TOTAL (WETLANDS)		0.374 acre				0.781 acre
Lake White (No Mitigation Proposed)**	Permanent and temporary fill impacts	2.703 acre**	NA	NA	NA	NA
MITIGATION TOTAL (LAKE WHITE)		2.703 acre**				0.00 acre**

* No mitigation is proposed for impacts in existing concrete spillway.

** No mitigation is proposed for impacts to Lake White.

*** Sunday Creek Coal Company Pooled Mitigation Area

b. Proposed Mitigation Site Information

On-Site Stream Mitigation Location (Crooked Creek Relocation) - On-site relocation/restoration of Crooked Creek is proposed for the PIK-104-10.64 project due to the unavoidable permanent filling of 1,090 feet of the existing Crooked Creek OHWM channel. The proposed relocation alignment is located immediately to the east of the existing channel and adjacent to Wetland 8. The relocated channel will discharge into Pee Pee Creek approximately 1,300 feet downstream of the Lake White Dam spillway. Preliminary design plans for the Crooked Creek relocation have been prepared (see Appendix E). The relocated channel will be approximately 1,070 feet in length and will utilize natural stream channel design techniques. Utilization of natural stream design techniques (including construction of rock cross vanes, J hooks, toe wood, live branch layering, and constructed riffles) will improve in-stream aquatic habitat and streambank habitat and restore

appropriate channel dimension, pattern, and profile for this stream. This, in turn, will reduce shear stress, erosion, and scour and will improve water quality. The Crooked Creek relocation will also restore approximately three acres of forested floodplain adjacent to the relocated channel, which will provide improved terrestrial riparian habitat. Channel dimension and profile improvements will also provide a better hydrologic connection to adjacent floodplain areas, which will provide better flood control and will improve the functional benefits provided by the adjacent 3.0 acre Wetland 8. At a 1:1 on-site mitigation ratio, the 1,070 foot channel relocation/restoration will provide 1,070 feet of the **1,476 feet** of total stream mitigation proposed by ODOT for the PIK-104-10.64 Minimal Degradation (Selected) Alternative. The relocated/restored Crooked Creek channel will be constructed on ODNR property (see Exhibit 5i), and will be preserved in perpetuity by ODNR.

Off-Site Stream Mitigation Location (Sunday Creek Coal Company Pooled Mitigation Area) - The Sunday Creek Coal Company (SCCC) Pooled Mitigation Area is located in the Wayne National Forest in Athens County. This mitigation area is located in the Hocking River watershed (HUC 05030204), which is adjacent to the Lower Scioto River watershed (HUC 05060002) and serves the serves the PIK-104-10.64 project area. ODOT established this site to mitigate impacts for various ODOT projects. ODOT transferred the SCCC property to ODNR in 2007 for long-term management and protection in perpetuity, and OEPA approved the site for mitigation use in 2008 (see Appendix E). This 966-acre mitigation area is primarily covered in second growth hardwood forest, and contains wetlands and 44,610 feet of Class II and Class III Primary Headwater Habitat streams. The current stream mitigation balance at the SCCC site is 912.25 feet (see Appendix E). As proposed in the table above, the PIK-104-10.64 Minimal Degradation (Selected) Alternative will deduct **406 feet** from the current stream mitigation balance, leaving **506.25 feet** of remaining stream mitigation credit available for use at the SCCC pooled mitigation area.

Off-Site Wetland Mitigation Location (Redstone Farm Mitigation Bank) - The Red Stone Farm Mitigation Bank is a private wetland mitigation bank that was approved by the Ohio Interagency Review Team (IRT) on September 20, 2007. The bank is located in Pike County, Ohio with a total approved area of 480.5 contiguous acres potentially providing 314 wetland mitigation credits. The IRT recognizes this bank as an appropriate location for mitigation of Category 2 wetlands within the Lower Scioto River (HUC 05060002) watershed. Phase 1 of Red Stone Farm Wetland Mitigation Bank is in its 6th growing season and includes a total footprint of 196 contiguous acres with approximately 92 acres of restorable wetlands. Nineteen (19) acres of emergent wetland restoration occurs in this phase, as well as the preservation of 96 acres of hillside forest protecting the headwaters. Also included are 11.7 acres of scattered tracts of pre-existing (prior to bank development) young to middle-aged forested wetlands, including the oldest tract in the bank which is classified as a Category 3 wetland with superior wetland habitat. ODOT will purchase **0.781 acre** of Category 2 and 3 wetland credit at the Redstone Farm bank in accordance with the requirements of OAC 3745-1-54 and the proposed mitigation strategy outlined in Block 10k.1.a and Table H. Additional information on the Redstone Farm Mitigation Bank is provided in Appendix E.

c. Additional Mitigation Plans/Environmental Commitments

ODOT will ensure that the project contractor follows Best Management Practices for temporary sediment and erosion control during construction. Short-term water quality impacts due to runoff from disturbed areas during construction will be minimized through the use of sediment and erosion controls in accordance with the ODOT *Construction and Materials Specifications (2013)*, including Section 107.19 (environmental protection), Section 601 (slope and channel protection), Section 659 (seeding and mulching), and Supplemental Specification 832 (Temporary Erosion and Sediment Control), which conform to Ohio EPA's National Pollutant Elimination Discharge System (NPDES) requirements for construction stormwater management. Notes and estimated quantities are included in the final design plans to handle erosion and sediment control. Longer-duration water quality impacts associated with roadway runoff will be minimized through the implementation of post-construction BMPs in accordance with the ODOT *Location and Design Manual*. An NPDES permit will be obtained prior to construction. As necessary, ODOT will restore (with native species) disturbed areas along the project corridor and adjacent to streams and wetlands impacted by the project.

Procedures outlined in *FHWA's 1999 Guidance on Invasive Species* will be implemented as necessary to minimize the potential for the spread of invasive plants during construction activities.

All tree cutting will occur between October 1 and March 31 to reduce the potential for impact to Indiana bat and northern long-eared bat (see Block 10b.1.e). If suitable bat roost trees must be cut between April 1 and September 30, a net survey will be conducted between June 15 and July 30 prior to cutting and coordinated with USFWS and ODNR. Additionally, no tree cutting will take place between April 1 to August 31 to reduce the potential for impact to Bewick's wren.

In-water work in perennial Warmwater Habitat streams (Crooked Creek and Pee Pee Creek) will be minimized to the extent possible between April 15 and June 30 to reduce impacts to native aquatic species and habitat. However, due to tight schedule constraints with regard the lowering of water levels in Lake White, roller compacted concrete construction, and other sequential construction activities, complete avoidance of in-stream work during this time frame is not likely to be feasible.

A plan note will be added to the design plans specifying Best Management Practices for construction work within and adjacent to the Pike Water Company Drinking Water Source Protection Area, the Flour-B&W Portsmouth Drinking Water Source Protection Area, and the Aqua Ohio-Lake White Public Water System Protection Area. The note also provides emergency contact information in the event of a hazardous material spill.

A plan note will be added to the final design plans stating that construction workers should not harm or kill timber rattlesnakes, if encountered in the project area.

A plan note will be added to the final design plans stating that the stone piles associated with the Lake White Dam be avoided during construction.

Design plans are being coordinated with the local floodplain administrator and any necessary floodplain permits will be obtained prior to construction.

2. Preferred Alternative

As summarized in Block 10b, the Preferred Alternative for the PIK-104-10.64 project would impact 1,472 total feet of stream channel (including spillway impacts), 0.690 acre of non-isolated wetland, and 2.703 acres of jurisdictional lake. Impacted streams include Pee Pee Creek and Crooked Creek in the Scioto River drainage. Impacted wetlands include Wetlands 1, 4, 6, 7, 8, 9, and 10 in the Scioto River drainage. The jurisdictional lake impacted by the project is Lake White, which formed as a result of dam construction across the Pee Pee Creek channel. A summary of impacts by feature is presented below:

• Pee Pee Creek (OEPA Warmwater Habitat)	357 feet
• Crooked Creek (OEPA Warmwater Habitat)	1,115 feet
• Wetland 1 (Category 2)	0.277 acre
• Wetland 4 (Modified Category 2)	0.054 acre
• Wetland 6 (Category 2)	0.178 acre
• Wetland 7 (Category 2)	0.009 acre
• Wetland 8 (Category 2)	0.042 acre
• Wetland 9 (Category 2)	0.090 acre
• Wetland 10 (Category 2)	0.040 acre
• Lake White (Traditional Navigable Water)	2.703 acres

The proposed mitigation strategy for the Preferred Alternative is the same as the Minimal Degradation (Selected) Alternative: 1) mitigate impacts to 1,070 feet of Crooked Creek on site at a 1:1 ratio through Crooked Creek relocation/restoration using natural channel design techniques; 2) mitigate remaining stream impacts at the Sunday Creek Coal Company (SCCC) pooled mitigation area; and 3) mitigate impacts to wetlands at the Redstone Farm Mitigation Bank (see Appendix E). *No compensatory mitigation is proposed for jurisdictional Lake White impacts, which are considered to be minor overall, and will not result in a loss of aquatic resource function or an overall lowering of water quality. Additionally, ODOT is not proposing compensatory mitigation for the 102 feet of impact to Pee Pee Creek within the existing spillway. At this location, the proposed permanent fill is confined to a permanently modified, concrete spillway area and will not result in a temporary or permanent loss of aquatic resource function or an overall lowering of water quality.* The following table summarizes the mitigation plan proposed by ODOT for impacts to streams and wetlands by the Preferred Alternative.

Preferred Alternative - Proposed Mitigation

Resource	Impact Type	Total Impact to Mitigate (feet or acre)	On Site or Off Site	Ratio	Proposed Mitigation Site	Mitigation Applied
Pee Pee Creek	Permanent and temporary fill impacts below spillway	120 feet	Off Site	1.5:1	SCCC***	180 feet
<i>Pee Pee Creek (No Mitigation Proposed)*</i>	Permanent fill impacts within existing concrete spillway	102 feet*	NA	NA	NA	NA
Pee Pee Creek	Permanent and temporary fill impacts at Crooked Creek relocation (downstream end)	135 feet	Off Site	1.5:1	SCCC***	203 feet
Crooked Creek	Permanent fill and channel relocation	1,070 feet	On Site	1:1	Crooked Creek Relocation	1,070 feet
Crooked Creek	Permanent fill and channel relocation	20 feet	Off Site	1.5:1	SCCC***	30 feet
Crooked Creek	Temporary fill impact at Crooked Creek relocation (upstream end)	25 feet	Off Site	1.5:1	SCCC***	38 feet
MITIGATION TOTAL (STREAMS)		1,370 feet*				1,521 feet
Wetland 1 (Forested – Category 2)	Permanent fill and permanent non-fill vegetation removal impacts	0.277 acre	Off Site	2.5:1	Redstone Farm Bank	0.693 acre
Wetland 4 (Scrub-Shrub – Category 2)	Permanent fill and permanent non-fill vegetation removal impacts	0.054 acre	Off Site	2:1	Redstone Farm Bank	0.108 acre
Wetland 6 (Scrub-Shrub – Category 2)	Permanent fill and permanent non-fill vegetation removal impacts	0.178 acre	Off Site	2:1	Redstone Farm Bank	0.356 acre
Wetland 7 (Scrub-Shrub – Category 2)	Temporary fill and permanent non-fill vegetation removal impacts	0.009 acre	Off Site	2:1	Redstone Farm Bank	0.018 acre
Wetland 8 (Forested – Category 2)	Permanent fill and permanent non-fill vegetation removal impacts	0.042 acre	Off Site	2.5:1	Redstone Farm Bank	0.105 acre
Wetland 9 (Emergent – Category 2)	Permanent (indirect) loss of hydrology	0.090 acre	Off Site	2:1	Redstone Farm Bank	0.180 acre
Wetland 10 (Scrub-Shrub – Category 2)	Permanent fill impact	0.040 acre	Off Site	2:1	Redstone Farm Bank	0.080 acre
MITIGATION TOTAL (WETLANDS)		0.690 acre				1.540 acres
<i>Lake White (No Mitigation Proposed)**</i>	Permanent and temporary fill impacts	2.703 acre**	NA	NA	NA	NA
MITIGATION TOTAL (LAKE WHITE)		2.703 acre**				0.00 acre**

* No mitigation is proposed for impacts in existing concrete spillway.
** No mitigation is proposed for impacts to Lake White.
*** Sunday Creek Coal Company Pooled Mitigation Area

3. Conclusion Regarding the Minimal Degradation Alternative and the Preferred Alternative

The Minimal Degradation Alternative is the current (selected) build alternative for the PIK-104-10.64 project and the alternative for which design plans have been prepared. The Preferred Alternative is the same as the Minimal Degradation Alternative with the following exception: 3:1 slopes in roller compacted concrete construction areas in lieu of the proposed 2:1 slopes. Due to the wider footprint of the 3:1 roller compacted concrete slopes (see Appendix D), construction of the Preferred Alternative would result in the following increased impacts to jurisdictional waters:

- Pee Pee Creek: Additional 30 feet of permanent impact
- Wetland 1: Additional 0.253 acre of permanent impact
- Wetland 4: Additional 0.016 acre of permanent impact
- Wetland 6: Additional 0.038 acre of permanent impact
- Wetland 7: 0.009 acre of permanent and temporary impact

In summary, the Preferred Alternative would increase Warmwater Habitat stream impacts by 30 feet and would increase Category 2 wetland impacts by 0.316 acre. Additionally, the Preferred Alternative would impact 1.6 additional acres of upland and floodplain forest and a USDA conservation easement property. The Preferred Alternative would also cost approximately \$1.3 million more to construct than the Minimal Degradation (Selected) Alternative. The Preferred Alternative would also have greater impacts on Lake White State Park recreational area. As discussed at the start of Block 10 (see Pages 23-25), the PIK-104-10.64 project has been developed using ODOT's Project Development Process (PDP) which addresses the requirements of NEPA, as well as the goals of the NEPA/404 merger - a practice that was initiated to streamline project decision-making on Federal-aid projects involving evaluation of alternatives, assessment of impacts to resources, and balancing resource impacts and project needs. Consequently, the PIK-104-10.64 project has been developed and refined using a "minimal degradation" approach from the start of the project (for all environmental resources, including jurisdictional waters), and as a result, the Minimal Degradation (Selected) Alternative provides a reduced impact scenario compared to the Preferred Alternative at lower cost. As discussed on Pages 23-25, no other design alternatives are considered feasible or practicable for this project. Therefore, the Minimal Degradation Alternative is considered to be the best overall alternative for the project from a design, impact, and cost standpoint, and is confirmed as the Selected Alternative for the PIK-104-10.64 project.

4. Conclusion Regarding the Non-Degradation Alternative

As discussed throughout Block 10, the Non-Degradation (No Build) Alternative involves no improvements to existing SR 104, Lake White Dam, and the SR 104 bridge over the Lake White Dam spillway. The ecological, social, and economic benefits of this alternative are minimal, and implementation of this alternative would not address critical dam condition/safety issues, spillway bridge deterioration problems, and SR 104 roadway and intersection safety needs. Implementation of the Non-Degradation Alternative could potentially result in a critical dam failure which would cause extensive downstream flooding and likely result in the loss of human life. A catastrophic event of this nature would have extraordinary social, economic, and ecological consequences. Consequently, under the Non-Degradation Alternative scenario, impacts to streams, wetlands, Lake White and other environmental resources would be expected in the future due to the continual need for roadway and dam maintenance projects, along with occasional larger-scale emergency projects, in an effort to keep SR 104 open to traffic and to avoid a critical dam failure. The monetary cost of these future maintenance projects and the associated environmental impacts/mitigation would eventually exceed those of the Minimal Degradation (Selected) Alternative (or the Preferred Alternative), and would likely result in social and economic impacts due to road closures/traffic detours, loss of access to the Lake White State Park area, and an overall decline in attractiveness from a recreation/tourism standpoint. Consequently, the Non-Degradation Alternative is not considered to be a safe or practicable alternative for the PIK-104-10.64 project.