

LEVEL 2 ECOLOGICAL SURVEY REPORT



OHIO DEPARTMENT OF TRANSPORTATION
OFFICE OF ENVIRONMENTAL SERVICES
1980 WEST BROAD STREET
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Project C-R-S / Name:	WAS-821-3.68
Project Identification Number (PID):	91295
Report Type:	Level Two ESR
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PROJECT SUMMARY

LOCATION DATA	
ODOT District:	District 10
County(ies):	Washington
Township(s):	Muskingum
Project Center (lat./long.):	39.4951 -81.4425
Project Area Size (Ac):	15.86

PROJECT DESCRIPTION
<p>The proposed highway maintenance project involves realigning an approximately 0.70 mile segment of SR 821 to avoid a slip plane (landslide). The project area is located three miles north of the City of Marietta, in Muskingum Township, Washington County, Ohio. The proposed realignment will shift southeastward from the existing alignment into an adjacent forested hillside in order to relocate onto a stable foundation. The proposed alignment centerline is a maximum of 100 feet from the existing centerline of the current alignment (see Figures 1, 2, and 3).</p> <p>Retaining walls, pilings, and sections of pavement approximately 10 feet in thickness exist along the current alignment and attest to the long-term maintenance and repair costs endured by the Department. This project was declared a Type C slip repair identified as part of the OH-11-02 Flood Emergency and includes federal funding. This location was determined to be ODOT District 10's number one landslide repair priority.</p> <p>The proposed alignment is very close to the existing alignment but it will require substantial cuts into the adjacent steep forested hillside. The forested hillside includes several ephemeral drainages that flow into the existing drainage ditch along SR 821. After construction, ephemeral drainages will flow into catch basins and outlet into New Year's Creek by way of culvert pipes (diameter 15" to 48") running parallel and adjacent to the new SR 821 alignment.</p> <p>Alternatives are limited. Shifting the alignment northwestward away from the steep forested hillside and into the adjacent stream valley would require massive fills and approximately one mile of relocation of New Year's Creek, a Warmwater Habitat of Duck Creek. The only reasonable choices are the No Build or move the road into the hillside in order to make repairs and build on a stable foundation. The No Build is not feasible or prudent because it would require ongoing maintenance funds that would only provide a "band aid" for the continuously slipping roadway.</p> <p>Two alternative alignments into the hillside were investigated. The original alignment into the hillside was refined to minimize impacts to the extent possible (See Figure 3 and 4). The original alignment resulted in 20.53 acres of impact to terrestrial habitat, mostly mature forest, and 2,255 linear feet of impact to intermittent or ephemeral streams. The refined or minimal impact alignment, which is preferred, includes an alignment that was "pulled in" to coincide with the existing alignment as much as possible but still be constructed on a geologically stable foundation. This "refined" alignment will impact 15.86 acres of terrestrial habitat and 2,160 linear feet of intermittent or ephemeral streams.</p>

ECOLOGICAL IMPACT SUMMARY (Impacts may be preliminary and subject to revision)
<p>The proposed realignment will require substantial cuts into the adjacent steep forested hillside. Initially, 20.53 acres of impact to terrestrial habitat was anticipated with the preliminary alignment. However,</p>

through avoidance and minimization, final terrestrial impacts include 13.09 acres of mixed deciduous forest; 1.9 acres of high intensity land cover (existing SR 821 and sparsely vegetated shoulders) and 0.9 acre of pasture. Stream impacts (fill or cut slope) include 1,960 linear feet of provisional Class I ephemeral stream channel and 200 linear feet of provisional Class II intermittent stream channel. Total "stream" impact is 2,160 linear feet. Stream impacts for the original alignment were similar but included 95 linear feet of additional impact.

In addition, two provisional Category 1 palustrine emergent non-persistent wetlands formed within low areas and tire ruts along an old logging road/ATV trail within the forest in an area that will be "cut" during construction. Both wetland habitats will be eliminated (fill or cut slope) and total 0.064 acre.

Forested habitats within the work limits will be cleared and grubbed. The hillside will be cut and shaped to accommodate the new roadway base. One culvert will be replaced and extended to accommodate the single Class II intermittent stream. The remaining ephemeral drainages will be collected within catch basins and culvert pipe. Continuous culvert pipe ranging in diameter from 15" to 48" will be installed parallel and adjacent to the new SR 821 alignment thus replacing the open roadway ditch that is subject to erosion. Ephemeral drainages will continue to flow into New Year's Creek after construction with no loss of function.

LITERATURE REVIEW							
Literature Source(s) Reviewed (check all that apply)		Results of Review	Map Included In Appendix				
<input checked="" type="checkbox"/>	Ecoregion Map	List Ecoregion(s): (Choose an Ecoregion) 70a. Permian Hills	NO				
<input checked="" type="checkbox"/>	Physiographic Regions Map of Ohio	List Physiographic Region(s): 17.0 Marietta Plateau (Choose Physiographic Region)	NO				
<input checked="" type="checkbox"/>	USGS 7.5 Minute Topographic Quadrangle Maps	List quadrangle(s): <table border="1" style="width: 100%;"> <tr> <td style="width: 80%;">Lower Salem</td> <td style="width: 20%; text-align: right;">▼</td> </tr> <tr> <td>Marietta</td> <td style="text-align: right;">▼</td> </tr> </table>	Lower Salem	▼	Marietta	▼	Map Required
Lower Salem	▼						
Marietta	▼						
<input checked="" type="checkbox"/>	County Soil Survey	Mapped hydric soils within project area? NO	Map Required				
<input checked="" type="checkbox"/>	Ohio Water Quality Standards (Ohio Administrative Code, Chapter 3745-1)	Unnamed intermittent and ephemeral drainages to New Years Creek (WWH)	Not Applicable				
<input checked="" type="checkbox"/>	Biological and Water Quality Reports	List reports that cover project area (if applicable):	Not Applicable				
<input checked="" type="checkbox"/>	Hydrologic Unit Code(s) (HUC)	List 14 Digit Watershed boundaries within project area: 05030201120030	NO				
<input checked="" type="checkbox"/>	Total Maximum Daily Load (TMDL) Program	List TMDL status of project area (if applicable):	NO				
<input checked="" type="checkbox"/>	National and State Wild and Scenic River lists, and the Nationwide Rivers Inventory (NRI)	List river(s) within or near the project area (if within applicable reach): Not Applicable Not Applicable	NO				
<input checked="" type="checkbox"/>	Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM)	Is the project within a 100 year floodplain: NO	YES				
<input checked="" type="checkbox"/>	Ohio's Coastal Zone Management Area	Is the project within the Coastal Zone Management Area: NO	NO				
<input checked="" type="checkbox"/>	National Wetlands Inventory (NWI) and or Ohio Wetland Inventory Mapping (OWI)		NO				
<input checked="" type="checkbox"/>	ODNR Division of Natural Areas and Preserves Natural Heritage Database	Are there records for listed species within 1 mile of the project area? NO Summarize on State Listed Species Table	NO				
<input checked="" type="checkbox"/>	Federally Endangered, Threatened, Proposed and Candidate Species in Ohio	List and Summarize on Federally Listed Species Table	Not Applicable				
<input checked="" type="checkbox"/>	Oak Openings Region of Ohio	Is the project located within the Oak Openings Region of Ohio? NO	NO				
<input type="checkbox"/>	Other						

FIELD METHODS	
Field Investigator Name(s):	Chris Staron, Matt Raymond, Mike Pettegrew, Adrienne Earley, Kathleen Dunlap, Matt Perlik, Mike Austin
Affiliation:	Ohio Department of Transportation
Date(s) of Field Work:	April 30, 2012; July 11 through 13, 2012; October 3, 2012; January 17, 2013; June 14, 2013; July 16, 2013.
Weather Conditions:	Varied; hot, cold, wet, dry. Varied from sunny to overcast from mid to high 70's, 80's, and 90's to a low of 30.

Check all that apply

Stream Survey (Habitat and Biology)	
<input checked="" type="checkbox"/>	Field Evaluation Manual for Ohio's Primary Headwater Habitat Streams (v 2.3) (OEPA 2009)
<input type="checkbox"/>	Methods for Assessing Habitat in Flowing Waters: Using the Qualitative Habitat Evaluation Index (QHEI). (OEPA 2006)
<input type="checkbox"/>	Biological Criteria for the Protection of Aquatic Life: Volume I (OEPA 1987a), Volume II (OEPA 1987b, 2008a), Volume III (OEPA 1989, 2008b),
<input type="checkbox"/>	ODOT Ecological Manual: Sections 203.2.1.1 -Stream, 203.2.1.5-Fishes, 203.2.1.6-Macrobenthos, 203.2.1.7-Mussels (ODOT 2010)
<input type="checkbox"/>	Other Methods (describe and cite):
Wetland Delineation and Classification	
<input checked="" type="checkbox"/>	Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1 (Environmental Laboratory 1987)
	Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual:
<input checked="" type="checkbox"/>	Eastern Mountains and Piedmont
<input checked="" type="checkbox"/>	Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et.al. 1979)
<input checked="" type="checkbox"/>	Ohio Rapid Assessment Method for Wetlands v. 5.0, User's Manual and Scoring Forms (OEPA 2001)
<input type="checkbox"/>	Other Methods (describe and cite):
Other Waters	
<input checked="" type="checkbox"/>	ODOT Ecological Manual: Sections 203.2.1.3-Ditches/Swales, 203.2.1.4-Ponds/Lakes (ODOT 2010)
<input type="checkbox"/>	Other Methods (describe and cite):
Terrestrial	
<input checked="" type="checkbox"/>	ODOT Ecological Manual: Section 203.2.2 -Terrestrial Ecology (ODOT 2010)
<input type="checkbox"/>	Other Methods (describe and cite):
Listed Species	
<input checked="" type="checkbox"/>	ODOT Ecological Manual: Sections 203.2.3 -Listed Species (ODOT 2010)
<input type="checkbox"/>	Other Methods (describe and cite):

FIELD DATA COLLECTION RESULTS

AQUATIC ECOLOGY	
Streams	
Were any streams identified within the project area? (If NO, delete the Stream Table)	YES
Total number of streams within the project area:	7
Total length of streams within the project area (linear feet):	2,160

Wetlands	
Were any wetlands identified within the project area? (If NO, delete the Wetland Table)	YES
Total number of wetlands within the project area:	2
Total area of wetlands within the project area (acres):	0.064

Potentially Jurisdictional Ditches	
Were any potentially jurisdictional ditches identified within the project area? (If NO, delete the Potentially Jurisdictional Ditch Table)	NO
Total number of potentially jurisdictional ditches within the project area:	0
Total area of potentially jurisdictional ditches within the project area (acres):	0

Ponds	
Were any ponds identified within the project area? (If NO, delete the Pond Table)	NO
Total number of ponds within the project area:	0
Total area of ponds within the project area (acres):	0

Aquatic Life	
Were any fish communities sampled/observed within the project area? (If NO, delete the Fish Table)	NO
If yes, total number of fish species identified:	Enter Number
Were any aquatic macroinvertebrate communities sampled/observed within the project area? (If NO, delete the Macroinvertebrate Table)	NO
If yes, total number of aquatic macroinvertebrate species identified:	Enter Number
Were any mussel communities sampled/observed within the project area? (If NO, delete the Mussel Table)	NO
If yes, total number of mussel species identified:	Enter Number

STREAM TABLE : RESOURCES IDENTIFIED ON FIGURE 3

Stream Name/I.D.:	Photograph #(s):	Receiving Waters:	Drainage Area (mi ²):	14-Digit HUC:	Total Length Within Project Area (lin. ft.):	Is this Stream Captured within the Roadway Ditch:	Stream Hydrology Type:	USACE Flow Characteristics:	Habitat Assessment	Evidence of Mussels Present:	Biological Sampling Conducted			Ohio EPA Aquatic Life Use Designation (may be provisional based on qualitative data):	Anti-degradation Designation:	National or State Wild, Scenic, or NRI Stream, or within 1,000 ft. of a Wild or Scenic:	Within a HUC with an Approved or Pending TMDL:
											Salamanders Observed:	Fish Observed:	Aquatic Macro-invertebrates Observed:				
Stream 1	1,2,3	New Year's Creek	0.010	05030201120030	200	NO	Intermittent	Non-Relatively Permanent Water	HHEI 45	NO	None Found	None Found	None Found	Class II PHWH	(Choose)	NO	NO
Additional Information. List how the stream connects to a Traditional Navigable Water (TNW) and any other pertinent observations (such as water quality measurements if taken) :					Stream 1 flows into New Year's Creek. New Year's Creek flows into Duck Creek, of which the lower end is a TNW.												
Stream 2	4,5	New Year's Creek	0.002	05030201120030	230	NO	Ephemeral	Non-Relatively Permanent Water	HHEI 20	NO	None Found	None Found	None Found	Class I PHWH	(Choose)	NO	NO
Additional Information. List how the stream connects to a Traditional Navigable Water (TNW) and any other pertinent observations (such as water quality measurements if taken) :					Stream 2 flows into New Year's Creek. New Year's Creek flows into Duck Creek, of which the lower end is a TNW.												
Stream 3	6 through 12	New Year's Creek	0.005	05030201120030	400	YES	Ephemeral	Non-Relatively Permanent Water	HHEI 21	NO	None Found	None Found	None Found	Class I PHWH	(Choose)	NO	NO
Additional Information. List how the stream connects to a Traditional Navigable Water (TNW) and any other pertinent observations (such as water quality measurements if taken) :					Stream 3 flows into New Year's Creek. New Year's Creek flows into Duck Creek, of which the lower end is a TNW.												
Stream 4	13,14, 15	Stream 3	0.002	05030201120030	150	NO	Ephemeral	Non-Relatively Permanent Water	HHEI 17	NO	None Found	None Found	None Found	Class I PHWH	(Choose)	NO	NO
Additional Information. List how the stream connects to a Traditional Navigable Water (TNW) and any other pertinent observations (such as water quality measurements if taken) :					Stream 4 flows into Stream 3. Stream 3 flows into New Year's Creek. New Year's Creek flows into Duck Creek, of which the lower end is a TNW.												
Stream 5	16	Wetland 2	0.001	05030201120030	40	NO	Ephemeral	Non-Relatively Permanent Water	HHEI 17	NO	None Found	None Found	None Found	Class I PHWH	(Choose)	NO	NO
Additional Information. List how the stream connects to a Traditional Navigable Water (TNW) and any other pertinent observations (such as water quality measurements if taken) :					Stream 5 flows into Wetland 2. Wetland 2 is drained by Stream 4. Stream 4 flows into Stream 3. Stream 3 flows into New Year's Creek. New Year's Creek flows into Duck Creek, of which the lower end is a TNW.												

Stream 6	17,18	Stream 7	0.002	05030201120030	970	YES	Ephemeral	Non-Relatively Permanent Water	HHEI 27	NO	None Found	None Found	None Found	Class I PHWH	(Choose)	NO	NO
Additional Information. List how the stream connects to a Traditional Navigable Water (TNW) and any other pertinent observations (such as water quality measurements if taken) :					Stream 6 flows into New Year's Creek. New Year's Creek flows into Duck Creek, of which the lower end is a TNW.												
Stream 7	20,21	New Year's Creek	0.021	05030201120030	170	NO	Ephemeral	Non-Relatively Permanent Water	HHEI 29	NO	None Found	None Found	None Found	Class I PHWH	(Choose)	NO	NO
Additional Information. List how the stream connects to a Traditional Navigable Water (TNW) and any other pertinent observations (such as water quality measurements if taken) :					Stream 7 flows into New Year's Creek. New Year's Creek flows into Duck Creek, of which the lower end is a TNW.												

WETLAND TABLE : RESOURCES IDENTIFIED ON FIGURE 3

Wetland Name/I.D.:	Photograph #(s):	Hydrologic Connection:	Receiving Waters (if non-isolated):	14-Digit HUC Boundary the Wetland is Located within:	Located Within a Mapped Hydric Soil Unit(s):	Approximate Total Size (Ac.):	Wetland Area Located within the Project Area (Ac.):	ORAM Assessment Score:	Provisional Wetland Category (based on ORAM):	Known High Quality Wetland (from Natural Heritage Database):	Dominant Wetland Community(ies) Based on Cowardin (1979) Wetland Classifications:	Estimated Hydroperiod (Cowardin, 1979)
Wetland 1	22,23	Adjacent	Stream 3 by Non-jurisdictional ditch	05030201120030	NO Enter Soil Symbol	0.007	0.007	18	Category 1	NO	Palustrine - Emergent Wetland Nonpersistent	Saturated
Additional Information. List How the wetland connects to a Traditional Navigable Water (TNW) if non-isolated, dominant plant species, and any other pertinent observations :						Wetland 1 drains into Stream 3 by way of Non-jurisdictional drainage (as per ACOE B.L. 6/26/2013). Stream 3 flows into New Year's Creek. New Year's Creek flows into Duck Creek, of which the lower end is a TNW.						
Wetland 2	24,25,26	Abutting	Stream 4	05030201120030	NO Enter Soil Symbol	0.057	0.057	25	Category 1	NO	Palustrine - Emergent Wetland Nonpersistent	Saturated
Additional Information. List How the wetland connects to a Traditional Navigable Water (TNW) if non-isolated, dominant plant species, and any other pertinent observations :						Wetland 2 is drained by Stream 4 which flows into Stream 3. Stream 3 eventually flows to Duck Creek, of which lower end is a TNW.						

Terrestrial Ecology

VEGETATIVE COMMUNITIES	
List the number of distinct vegetative communities identified within the project area	3
Were any unique or high quality terrestrial habitats identified within the project area?	NO

TERRESTRIAL WILDLIFE	
Were any mammals observed within the project area? (If NO, delete the Mammal Table)	YES
If yes, total number of species identified:	7
Were any birds observed within the project area? (If NO, delete the Bird Table)	YES
If yes, total number of bird species identified:	12
Were any reptiles observed within the project area? (If NO, delete the Reptile Table)	NO
If yes, total number of reptile species identified:	0
Were any amphibian communities sampled/observed within the project area? (If NO, delete the Amphibian Table)	YES
If yes, total number of amphibian species identified:	1

Vegetative Communities and Land Cover Table : Vegetation and Land Cover Areas Identified on Figure 3			
Vegetative Communities and Land Cover found within the project area:	Degree of Man Induced Ecological Disturbance (based on descriptions in Andreas et. al., 2004)	Unique, Rare, or High Quality?	Acres
Upland Forest - UF - (uplands dominated by trees)	Intermediate Disturbance (dominated by plants that typify a stable phase of a native community that persists under some disturbance)	NO	13.09
Community Description (list dominant species, include Anderson (1982) community classification if applicable):	Other than existing SR 821 and linear strips of farm field on top of ridge, the entire project area to be impacted is comprised largely of relatively mature upland mixed deciduous forest situated on a hillside with a west, northwest, or north aspect. Dominant trees consisted of red oak, shagbark hickory, hackberry, black cherry, maple, and sycamore. Some trees likely ranged in age from 80 to 100 years. Disturbance was evident by the presence of logging trails, recreation vehicle trails and patches of garlic mustard or multiflora rose. A complete list of plants is included in this report.		
Developed, High Intensity (DH) - Includes highly developed areas where people reside or work in high numbers. Examples include apartment complexes, row houses and commercial/industrial. Impervious surfaces account for 80 to 100 % of the total cover.	High Disturbance (dominated by widespread taxa not typical of a particular community)	NO	1.9
Community Description (list dominant species, include Anderson (1982) community classification if applicable):	Approximately 1.9 acre of land cover to be impacted consists of the linear strip (nearly 0.7 mile in length) of existing SR 821 and the immediate roadway shoulders which are comprised of cinder, gravel and asphalt with a few roadside forbs such as chicory, mullein, etc.		
Pasture/Hay (PH) - Areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops, typically on a perennial cycle. Pasture/hay vegetation accounts for greater than 20 % of total vegetation.	High Disturbance (dominated by widespread taxa not typical of a particular community)	NO	0.9
Community Description (list dominant species, include Anderson (1982) community classification if applicable):	Linear strips of pasture, approximately 0.9 acre, occur on the top of a cuts near the southern limits of the project (see Figure 3).		

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Scientific Name:	Common Name:	Indicator Status:	Federally Listed:	State Listed:	Form
<i>Acer negundo</i>	Ash-Leaf Maple	FAC	NO	NO	Tree
<i>Acer rubrum</i>	Red Maple	FAC	NO	NO	Tree
<i>Acer saccharinum</i>	Silver Maple	FACW	NO	NO	Tree
<i>Adiantum pedatum</i>	Maidenhair Fern	UPL	NO	NO	Fern
<i>Aesculus flava</i>	Yellow Buckeye	FACU	NO	NO	Tree
<i>Alliaria petiolata</i>	Garlic Mustard	FACU-	NO	NO	Forb
<i>Allium tricoccum</i>	Ramp	FACU	NO	NO	Forb
<i>Arisaema triphyllum subsp. triphyllum</i>	Jack-In-The-Pulpit	FACU-	NO	NO	Forb
<i>Asarum canadense</i>	Canadian Wild Ginger	FACU	NO	NO	Forb
<i>Asimina triloba</i>	Pawpaw	FAC	NO	NO	Tree
<i>Blephilia hirsuta</i>	Hairy Pagoda-Plant	FACU	NO	NO	Forb
<i>Carex blanda</i>	Common Wood Sedge	FAC	NO	NO	Sedge
<i>Carex pensylvanica</i>	Pennsylvania Sedge	FAC	NO	NO	Sedge
<i>Carya alba</i>	Mockernut Hickory	UPL	NO	NO	Tree
<i>Conopholis americana</i>	Squawroot	UPL	NO	NO	Forb
<i>Cornus florida</i>	Flowering Dogwood	FACU	NO	NO	Sm Tree
<i>Daucus carota</i>	Queen-Anne's-Lace	UPL	NO	NO	Forb
<i>Dryopteris marginalis</i>	Marginal Wood Fern	FACU	NO	NO	Forb
<i>Elaeagnus umbellata</i>	Autumn Olive	FACU	NO	NO	Shrub
<i>Fagus grandifolia</i>	American Beech	FACU	NO	NO	Tree
<i>Fraxinus pennsylvanica</i>	Green Ash	FACW	NO	NO	Tree
<i>Galium aparine</i>	Cleavers	FACU	NO	NO	Forb
<i>Galium odoratum</i>	Sweet Woodruff	UPL	NO	NO	Forb
<i>Geranium maculatum</i>	Wild Geranium	FACU	NO	NO	Forb
<i>Geum vernum</i>	Spring Avens	FACU	NO	NO	Forb
<i>Gillenia stipulata</i>	American Ipecac	UPL	NO	NO	Forb
<i>Glechoma hederacea</i>	Ground Ivy	FACU	NO	NO	Forb
<i>Glyceria striata</i>	Fowl Manna Grass	OBL	NO	NO	Grass

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Scientific Name:	Common Name:	Indicator Status:	Federally Listed:	State Listed:	Form
<i>Hackelia virginiana</i>	Virginia Stickseed	FACU	NO	NO	Forb
<i>Hieraceum venosum</i>	Rattlesnake Hawkweed	UPL	NO	NO	Forb
<i>Houstonia caerulea</i>	Quaker-Ladies	FACU	NO	NO	Forb
<i>Impatiens capensis</i>	Spotted Touch-Me-Not	FACW	NO	NO	Forb
<i>Juncus effusus</i>	Soft Rush	FACW+	NO	NO	Forb
<i>Lamium purpureum</i>	Purple Deadnettle	UPL	NO	NO	Forb
<i>Lindera benzoin</i>	Spicebush	FACW-	NO	NO	Shrub
<i>Liriodendron tulipifera</i>	Tulip Tree	FACU	NO	NO	Tree
<i>Lonicera japonica</i>	Japanese Honeysuckle	FAC-	NO	NO	Vine
<i>Luzula bulbosa</i>	Bulbous Wood-Rush	FACU	NO	NO	Forb
<i>Maianthemum canadense</i>	Canada Mayflower	FAC-	NO	NO	Forb
<i>Maianthemum racemosum</i>	False Solomon's-Seal	FACU	NO	NO	Forb
<i>Microstegium vimineum</i>	Japanese Stilt Grass	FAC	NO	NO	Forb
<i>Nyssa sylvatica</i>	Black-Gum	FAC	NO	NO	Tree
<i>Onoclea sensibilis</i>	Sensitive Fern	FACW	NO	NO	Fern
<i>Organum vulgare</i>	Wild Oregano	UPL	NO	NO	Forb
<i>Osmorhiza claytonii</i>	Wooly Sweet Cicely	FACU-	NO	NO	Forb
<i>Oxydendrum arboreum</i>	Sourwood	UPL	NO	NO	Sm Tree
<i>Panicum clandestinum</i>	Deer's-Tongue Panic Grass	FAC+	NO	NO	Grass
<i>Panicum dichotomiflorum</i>	Fall Panic Grass	FACW-	NO	NO	Grass
<i>Parthenocissus quinquefolia</i>	Virginia Creeper	FACU	NO	NO	Vine
<i>Phlox divaricata</i>	Blue Phlox	FACU	NO	NO	Forb
<i>Pilea pumila</i>	Clearweed	FACW	NO	NO	Forb
<i>Platanus occidentalis</i>	Sycamore	FACW-	NO	NO	Tree
<i>Podophyllum peltatum</i>	Mayapple	FACU	NO	NO	Forb
<i>Polystichum acrostichoides</i>	Christmas Fern	FACU-	NO	NO	Fern
<i>Potentilla simplex</i>	Oldfield Cinquefoil	FACU	NO	NO	Shrub

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<i>Pernanthes sp.</i>	Lion's Foot	UPL	NO	NO	Forb
Scientific Name:	Common Name:	Indicator Status:	Federally Listed:	State Listed:	Form
<i>Quercus alba</i>	White Oak	FACU	NO	NO	Tree
<i>Quercus macrocarpa</i>	Bur Oak	FAC-	NO	NO	Tree
<i>Quercus rubra</i>	Red Oak	FACU-	NO	NO	Tree
<i>Ranunculus abortivus</i>	Kidney-Leaved Buttercup	FACW-	NO	NO	Forb
<i>Ranunculus recurvatus</i>	Blistorwort	FAC	NO	NO	Forb
<i>Ribes americanum</i>	Wild Black Current	FACW	NO	NO	Forb
<i>Robinia pseudoacacia</i>	Black Locust	FACU	NO	NO	Tree
<i>Rosa multiflora</i>	Multiflora Rose	FACU	NO	NO	Shrub
<i>Rubus occidentalis</i>	Black Raspberry	UPL	NO	NO	Shrub
<i>Rumex obtusifolius</i>	Bitter Dock	FACU	NO	NO	Forb
<i>Sassafras albidum</i>	Sassafras	FACU-	NO	NO	Tree
<i>Saxifraga virginensis</i>	Early Saxifrage	FAC	NO	NO	Forb
<i>Sedum ternatum</i>	Wild Stonecrop	UPL	NO	NO	Forb
<i>Senecio aureus</i>	Golden Ragwort	FACW	NO	NO	Forb
<i>Silene virginica</i>	Firepink	UPL	NO	NO	Forb
<i>Smilax rotundifolia</i>	Common Greenbrier	FAC	NO	NO	Vine
<i>Stellaria media</i>	Common Chickweed	UPL	NO	NO	Forb
<i>Thelypteris noveboracensis</i>	New York Fern	FAC	NO	NO	Fern
<i>Tiarella cordifolia</i>	Foamflower	FAC-	NO	NO	Forb
<i>Toxicodendron radicans</i>	Poison-Ivy	FAC	NO	NO	Vine
<i>Trifolium hybridum</i>	Aslike Clover	FACU	NO	NO	Forb
<i>Trifolium pratense</i>	Red Clover	FACU-	NO	NO	Forb
<i>Trifolium repens</i>	White Clover	FACU-	NO	NO	Forb
<i>Trillium grandiflorum</i>	White Trillium	UPL	NO	NO	Forb
<i>Tussilago farfara</i>	Coltsfoot	FACU	NO	NO	Forb
<i>Vaccinium stamineum</i>	Deerberry	FACU	NO	NO	Shrub
<i>Verbascum thapsus</i>	Common Mullein	FACU	NO	NO	Forb

<i>Viburnum acerifolium</i>	Maple-Leaved Viburnum	UPL	NO	NO	Shrub
<i>Viburnum prunifolium</i>	Black-Haw	FACU	NO	NO	Shrub
<i>Viola striata</i>	Striped Cream Violet	FACW	NO	FACW	Forb
<i>Vinca minor</i>	Periwinkle	UPL	NO	UPL	Vine

Additional Vegetation Observations:

In general, the project area consists of relatively mature upland mixed deciduous forest situated on a hillside with a west, northwest, or north aspect. Dominant trees consisted of red oak, shagbark hickory, hackberry, black cherry, maple, and sycamore. Some trees likely ranged in age from 80 to 100 years. The understory contained small saplings of the above listed tree species plus tulip poplar, spicebush, black-haw, and maple-leaved viburnum. Christmas fern was common in the understory along with mayapple, common greenbrier and poison-ivy. Some of the older logging trails and newer recreation vehicle trails included patches of garlic mustard or multiflora rose.

MAMMAL TABLE				
Scientific Name	Common Name	Federally Listed:	State Listed:	Location (use vegetative community codes):
<i>Odocoileus virginianus</i>	White-tailed Deer	Not Listed	Not Listed	Mixed Deciduous Upland Forest
<i>Canis latrans</i>	Coyote	Not Listed	Not Listed	Mixed Deciduous Upland Forest
<i>Procyon lotor</i>	Raccoon	Not Listed	Not Listed	Mixed Deciduous Upland Forest
<i>Tamias striatus</i>	Eastern Chipmunk	Not Listed	Not Listed	Mixed Deciduous Upland Forest
<i>Glaucomys volans</i>	Southern Flying Squirrel	Not Listed	Not Listed	Mixed Deciduous Upland Forest
<i>Eptesicus fuscus</i>	Big Brown Bat	Not Listed	Not Listed	Mixed Deciduous Upland Forest
<i>Lasiurus borealis</i>	Red Bat	Not Listed	Not Listed	Mixed Deciduous Upland Forest
<i>Myotis septentrionalis</i>	Northern Long-eared Myotis	Not Listed	Not Listed	Mixed Deciduous Upland Forest

Additional Mammal Observations:

White-tailed deer and raccoon were identified by tracks. The listed bat species and the southern fly squirrel were captured and identified during mist net surveys. The coyote was observed running along the recreational vehicle trail for a short stretch before darting off into the forest (MAA).

BIRD TABLE						
Scientific Name	Common Name	Date of Observation	Typical Ohio Range	Federally Listed:	State Listed:	Location (use vegetative community codes):
<i>Baeolophus bicolor</i>	Tufted Titmouse	4/30/2012	Year-Round Resident	Not Listed	Not Listed	Mixed Deciduous Upland Forest
<i>Buteo jamaicensis</i>	Red-Tailed Hawk	4/30/2012	Year-Round Resident	Not Listed	Not Listed	Mixed Deciduous Upland Forest
<i>Cathartes aura</i>	Turkey Vulture	4/30/2012	Year-Round Resident	Not Listed	Not Listed	Mixed Deciduous Upland Forest
<i>Corvus brachyrhynchos</i>	American Crow	4/30/2012	Year-Round Resident	Not Listed	Not Listed	Mixed Deciduous Upland Forest
<i>Dendroica petechia</i>	Yellow Warbler	7/11/2012	Breeding Season Resident	Not Listed	Not Listed	Mixed Deciduous Upland Forest
<i>Dryocopus pileatus</i>	Pileated Woodpecker	7/12/2012	Year-Round Resident	Not Listed	Not Listed	Mixed Deciduous Upland Forest
<i>Dumetella carolinensis</i>	Gray Catbird	7/12/2012	Breeding Season Resident	Not Listed	Not Listed	Mixed Deciduous Upland Forest
<i>Melanerpes carolinus</i>	Red-bellied Woodpecker	4/30/2012	Year-Round Resident	Not Listed	Not Listed	Mixed Deciduous Upland Forest
<i>Meleagris gallopavo</i>	Wild Turkey	4/30/2012	Year-Round Resident	Not Listed	Not Listed	Mixed Deciduous Upland Forest
<i>Pipilo erythrophthalmus</i>	Rufous-sided Towhee	6/14/2013	Year-Round Resident	Not Listed	Not Listed	Mixed Deciduous Upland Forest
<i>Poecile atricapillus</i>	Black-capped Chickadee	4/30/2012	Year-Round Resident	Not Listed	Not Listed	Mixed Deciduous Upland Forest
<i>Sitta carolinensis</i>	White-breasted Nuthatch	4/30/2012	Year-Round Resident	Not Listed	Not Listed	Mixed Deciduous Upland Forest

Additional Bird Observations:

Most birds were identified or "heard" while walking through the project area along the recreational vehicle trails. Most common birds were the black-capped chickadee and the white-breasted nuthatch.

AMPHIBIAN TABLE				
Scientific Name	Common Name	Federally Listed:	State Listed:	Location (use vegetative community codes):
<i>Lithobates clamitans</i>	Green Frog	Not Listed	Not Listed	Mixed Deciduous Upland Forest

Additional Amphibian Observations:

Juvenile green frogs were observed jumping in tire rut puddles near the northern limits of the project near Stream 7. Many logs were overturned in anticipation of finding redback salamanders (*Plethodon cinereus*) or slimy salamanders (*Plethodon glutinosus*). None were found. In addition, Streams 1 and 7 looked ideal for supporting dusky salamanders (*Desmognathus fuscus*), however, none were found.

Listed Species

FEDERALLY LISTED SPECIES	
Were any federally listed species observed within the project area?	NO
Were any suitable habitats for federally listed species (known to be within the range of the project area) observed within the project area?	YES
Were any designated critical habitats for federally listed species present within the project area?	NO
<p>Additional summary observations on federally listed species:</p> <p>There are no known captures or hibernacula records for the federally listed Indiana bat (<i>Myotis sodalis</i>) within a five-mile radius or ten-mile radius of the project site. The project area was surveyed for trees exhibiting characteristics of Indiana bat habitat. Many trees were identified as either suitable for summer roosting habitat (peeling loose bark, broken branches, cavities etc.) or as potential maternity roost trees (> 16" dbh, cavities, snags, peeling loose bark, solar exposure etc.). Rock outcroppings were searched for potential cave or hibernaculum. While rock outcroppings were found on the forested hillside, the sandstone was found to be friable (filling in voids) or rock was embedded. Nothing resembling a cave or potential crevice ideal for a hibernaculum was found. Mist net surveys were conducted July 11, 12, and 13. The subject project area was surveyed for two nights (minimum five hours each night) at two sites using four mist net sets over two wooded all-terrain vehicle trails. The surrounding forest included shagbark hickory, red oak, elm, hackberry, cherry, maple and sycamore. Small terraced wetlands were adjacent to mist net Site 1 (Wetlands 1 and 2). Seven bats of three species were captured during the survey including the Big Brown Bat, Red Bat, and Northern Long-Eared Myotis. No Indiana bats were found (see attached Mist Net Survey Report).</p> <p>Habitat for the following federally-listed aquatic species was not found within the project area, fanshell mussel, pink mucket pearly mussel, sheepnose mussel, snuffbox mussel, and eastern hellbender. Streams 2 through 7 are ephemeral drainages while Stream 1 is intermittent at best. All these federally listed aquatic species require perennial flow with good current. None of these species were observed and none would be expected within these streams or the downstream receiving stream New Year's Creek which is beyond the project area.</p> <p>The bald eagle was not observed within the project area. Furthermore, known nesting sites do not occur within ½ mile of the project area and no supercanopy trees near large water bodies (lakes, rivers) will be removed or impacted because of this project.</p> <p>The timber rattlesnake can be found in mixed deciduous forest in southern Ohio. Rock outcroppings within the project area appeared to be friable sandstone. Cracks and crevices associated with timber rattlesnake hibernaculum were not found. Although the entire project area is comprised of mixed deciduous forest, the nearest timber rattlesnake record occurs over 50 miles to the west in Athens County. To date, timber rattlesnake occurrences in Washington County are anecdotal only. No timber rattlesnakes were observed during the field surveys and long-term property owners rarely see snakes at all, let alone timber rattlesnakes. The lack of scientifically documented records from Washington County in last 150 years or more is a good indication that the timber rattlesnake will likely not show up during construction.</p>	

STATE LISTED SPECIES	
Are any state listed species known to be within 1 mile of the project area?	NO
Were any state listed species observed within the project area?	NO
If any state listed species are known to be within a mile of the project area (Natural Heritage Database record or other), was suitable habitat for the species observed within the project area?	NO
<p>Additional summary observations on state listed species:</p> <p>Based on the ODNR Natural Heritage Database there are no known records for state or federal listed species within 1 mile of the project area. Several records occur just beyond 1 mile within the Muskingum River which is an entire drainage away. Impacts to state listed species are not anticipated.</p>	

Federally Listed Species Table: All species observed within the project area, or known to be within the county(ies) the project is located within			
Scientific Name	Common Name	Listing	Discuss Presence of Suitable Habitat(s) (note designated critical habitat if present)
<i>Myotis sodalis</i>	Indiana Bat	Endangered	<p>Complete Attached Bat Habitat Worksheet in Appendix C. Include Figure(s) indicating the location of potential Indiana Bat habitat trees when feasible.</p> <p>Many trees were identified as either suitable for summer roosting habitat (peeling loose bark, broken branches, cavities etc.) or as potential maternity roost trees (> 16" dbh, cavities, snags, peeling loose bark, solar exposure etc.). Rock outcroppings were searched for potential cave or hibernaculum. While rock outcroppings were found on the forested hillside, the sandstone was found to be friable (filling in voids) or rock was embedded. Nothing resembling a cave or potential crevice ideal for a hibernaculum was found.</p>
<i>Cyprogenia stegaria</i>	Fanshell	Endangered	Streams 2 through 7 are ephemeral drainages while Stream 1 is intermittent at best. The fanshell requires perennial flow with good current. Habitat for freshwater mussels does not occur within the project area.
<i>Lampsilis orbiculata</i>	Pink Mucket Pearly Mussel	Endangered	Streams 2 through 7 are ephemeral drainages while Stream 1 is intermittent at best. The fanshell requires perennial flow with good current. Habitat for freshwater mussels does not occur within the project area.
<i>Plethobasus cyphus</i>	Sheepnose	Endangered	Streams 2 through 7 are ephemeral drainages while Stream 1 is intermittent at best. The sheepnose requires perennial flow with good current. Habitat for freshwater mussels does not occur within the project area.
<i>Epioblasma triquetra</i>	Snuffbox	Endangered	Streams 2 through 7 are ephemeral drainages while Stream 1 is intermittent at best. The snuffbox requires perennial flow with good current. Habitat for freshwater mussels does not occur within the project area.
<i>Cryptobranchus alleganiensis</i>	Eastern Hellbender	Species of Concern	Streams 2 through 7 are ephemeral drainages while Stream 1 is intermittent at best. The eastern hellbender requires perennial flow with good current. Habitat for the eastern hellbender does not occur within the project area.
<i>Crotalus horridus</i>	Timber Rattlesnake	Species of Concern	The timber rattlesnake can be found in mixed deciduous forest in southern Ohio. Rock outcroppings within the project area appeared to be friable sandstone. Cracks and crevices associated with timber rattlesnake hibernaculum were not found. However, the entire project area is comprised of mixed deciduous forest, ideal habitat for the timber rattlesnake
<i>Haliaeetus leucocephalus</i>	Bald Eagle	Species of Concern	No supercanopy trees near large water bodies (lakes, rivers) will be removed or impacted because of this project. In addition, no large rivers, lakes or marshes will be impacted by this project. Habitat for the bald eagle does not occur within the project area.

IMPACT SUMMARY

STREAMS IMPACTS	
Will any streams be impacts by the project? (If NO, delete the Stream Impact Table)	YES
Total number of streams impacted by the project (list multiple alignments separately):	7
Total length of streams impacted by the project (feet):	2,160

Stream Impacts Table			Alternative Impacts (ft.)		
Stream I.D.	Use Designation	USACE Flow Characteristics	Alternative 1 No Build	Alternative 2 Initial Alignment	Alternative 3 Preferred Minimal Alignment
Stream 1	Class II PHWH	Non-Relatively Permanent Water	None	130	200
Stream 2	Class I PHWH	Non-Relatively Permanent Water	None	270	230
Stream 3	Class I PHWH	Non-Relatively Permanent Water	None	440	400
Stream 4	Class I PHWH	Non-Relatively Permanent Water	None	215	150
Stream 5	Class I PHWH	Non-Relatively Permanent Water	None	80	40
Stream 6	Class I PHWH	Non-Relatively Permanent Water	None	970	970
Stream 7	Class I PHWH	Non-Relatively Permanent Water	None	150	170

Total impacts (ft)	0	2,255	2,160
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Discuss the type of impact(s) expected to each stream. If a stream is impacted at multiple locations, discuss each location separately and include the distance (stream length) from other impacted locations.

In each case, Streams 2 through 7 are Class I ephemeral streams at best that have drainage areas ranging from 0.001 to 0.021 square mile. Each stream flows perpendicular to existing SR 821. In some cases, existing culverts under SR 821 have been plugged and filled causing these drainages to flow parallel along SR 821 for several hundred feet before existing through small clay pipes under SR 821 and dropping more than 50' to New Year's Creek below. The new alignment and hillside cuts will cause existing stream channels, especially Streams 3 and 6 that flow in the existing roadside ditch during rain events, to be cut and then filled with roadway embankment. Existing ephemeral or intermittent drainages from the hillside that remain after construction will be collected in catch basins connected to culvert pipes installed parallel and adjacent to the new SR 821. These pipes will range in diameter from 15" to 48" and will outlet into New Year's Creek just as they did prior to construction. Stream 1 is provisional Class II intermittent and will be connected to New Year's Creek with a new culvert underneath the proposed SR 821.

WETLAND IMPACTS	
Will any wetlands be impacted by the project? (If NO, delete the Wetland Impact Table)	YES
Total number of wetlands impacted by the project	2
Total area of wetlands impacted by the project (acres):	0.064

Wetland Impacts Table			Alternative Impacts (ac)		
Wetland I.D.	Provisional Wetland Category	Hydrologic Connection	Alternative 1 No Build	Alternative 2 Initial Alignment	Alternative 3 Proposed Minimal Alignment
Wetland 1	Category 1	Adjacent	0	0.007	0.007
Wetland 2	Category 1	Abutting	0	0.057	0.057

Total impacts (ac)	0	0.064	0.064
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Discuss the types of impact(s) expected to each wetland.
Wetland habitats are located on a terrace created by and old logging road/ATV trail approximately 70 to 130 feet east of existing SR 821. In each case, wetland habitats are located within hillside cuts for Alternatives 1 and 2. Both wetland habitats will be eliminated during construction.

IMPACTS TO AQUATIC LIFE
Discuss the expected impacts to aquatic fauna (fish, mussels, aquatic macroinvertebrates). Specific stream locations should be referenced when appropriate.
Streams 2 through 7 are ephemeral drainages and flow only during rain events. Stream 1 is Class II intermittent, possibly ephemeral. In either case, no aquatic macroinvertebrates or stream dwelling salamanders were found. Rocks were turned in Streams 1 and 7 as habitat looked potentially suitable for dusky salamanders, but none were found. Impacts to aquatic fauna are negligible.

OTHER WATER QUALITY IMPACTS
Discuss potential short term and long term water quality impacts that are likely expect to occur as a result of the proposed project.
During construction we can anticipate elevated sediments and turbidity in New Year's Creek, the receiving stream that is located beyond construction limits.
Discuss how the project will be implemented to minimize these water quality impacts.
Short term water quality impacts resulting from runoff from disturbed areas during construction will be minimized through the use of sediment and erosion controls in accordance with the ODOT <i>Construction and Materials Specifications</i> . Longer duration water quality impacts associated with roadway runoff will be minimized through the implementation of post-construction best management practices in accordance with the ODOT <i>Location and Design Manual</i> .

VEGETATIVE COMMUNITY AND LAND COVER IMPACTS	
Will any vegetative communities be impacted by the project? (If NO, delete the Vegetative Community Impact Table)	YES
Total number of vegetative communities impacted by the project:	3
Total area of vegetative communities impacted by the project (acres):	15.86
Describe any impacts to vegetative communities (with emphasis on rare or unique communities) from an ecological perspective:	
<p>The project area is comprised mostly of relatively mature mixed deciduous forest with intermediate disturbance quality. Several days in the field during all seasons did not reveal the presence of any rare or unique communities. Of the 15.86 acres within the project area, 13.09 acres are comprised of mixed deciduous forest, 1.9 acres consist of existing SR 821 and the immediate sparsely vegetated roadway shoulders, and 0.9 acre consist of linear strips of farm field (pasture) located at the top of the forested hillside. Vegetated communities will be cleared and grubbed and the hillside will be cut and sloped to build a stable roadway foundation for the new alignment and, create highway slopes that allow for the appropriate safety clear zone.</p>	

Vegetative Community and Land Cover Impacts Table			Alternative Impacts (ac)		
Vegetative Community	Disturbance Level	Unique, Rare, or High Quality	Alternative 1 No Build	Alternative 2 Original Alignment	Alternative 3 Minimal Preferred
Upland Forest	Intermediate Disturbance	NO	0	14.73	13.06
Developed, High Intensity	High Disturbance	NO	0	1.9	1.9
Pasture/Hay	High Disturbance	NO	0	3.9	0.9
Total impacts			0	20.53	15.86

IMPACTS TO TERRESTRIAL WILDLIFE
Discuss any terrestrial habitat alternations that may result from construction activities:
<p>The proposed project will impact mixed deciduous upland forest, high intensity land cover, and pasture. These vegetative communities support a variety of wildlife, although reptiles and amphibians were not found, they must be present, at least in low numbers. Clearing and grubbing of 15.86 acre of primarily upland forest on the steep hillside will be disruptive and cause a loss of habitat for terrestrial wildlife. Commensurate indirect and direct impacts to wildlife species through kills and habitat loss may occur.</p>
Discuss the expected duration of the impacts (temporary/short term or permanent/long-term):
<p>Construction noise is a short-term impact most likely to interfere with birds. The development impacts associated with tree clearing and earthwork are of a longer duration. It may take 10 years or more for vegetative communities to reestablish beyond the immediate roadway and clear zone.</p>
Discuss if the project impacts would result in the likely extirpation of any taxa from the area:
<p>Because no unique or rare species were found within the project area or are known based on records, it is very unlikely that a project such as this would cause the extirpation of any taxa from the area. The surrounding area, beyond the project area, is forested with hundreds of square miles of ridges and valleys ubiquitous within southeastern Ohio and Washington County in particular.</p>
Include a general discussion of impacts to terrestrial fauna (mammals, birds, reptiles, and amphibians):
<p>During construction, wildlife mortality may occur within the proposed realignment foot print. Smaller animals that are unable to fly or run from the construction activities will be most susceptible (ie; box turtles and salamanders were not found, but are likely present). During construction, destruction to natural habitats may kill wildlife and noise may deter other species from using the area.</p>

FEDERALLY LISTED SPECIES IMPACTS	
Will any federally listed species or suitable habitat for federally listed potentially be impacted by the project? (If NO, delete the Federally Listed Species Impact Table)	YES
Will any designated critical habitats potentially be impacted by the project?	NO

Federally Endangered Indiana Bat (<i>Myotis sodalis</i>) Impact Table				
Alternative I.D.	Potential Maternity Roost Tree Impacts (#)	Potential Roost Tree Impacts (#)	Total Forest Habitat Impacts (ac)	Anticipated Impacts
Alternative 1 No Build	0	0	0	None
Discussion of Impacts: The no build alternative would have no impacts on the Indiana bat.				
Alternative 2 Original Alignment	Not Counted	> 50	14.73	Not Likely
Discussion of Impacts: See discussion of impacts below.				
Alternative 3 Minimal Preferred Alignment	Not Counted	> 50	13.09	Not Likely
Discussion of Impacts: Approximately 13.09 acres of mixed deciduous upland forest would be impacted by the proposed alignment and 14.73 acres by the original "unrefined" alignment. Because of forested impacts and the high number of trees characteristic of Indiana bat summer roosting habitat, a mist nest survey for the federally listed Indiana bat was carried out on the nights of July 11, 12, and 13, 2012 (see attached report). Seven bats of three species were captured during the survey including big brown bat, red bat, and northern long-eared myotis. No Indiana bats were round. In addition, there are no known captures or hibernacula records within a 5 miles radius or 10 miles radius of the project area and, while rock outcroppings occur sparsely along the forested hillside, none were suitable as a cave or crevice hibernaculum. Based on these findings, the project may affect, but not likely to adversely affect the Indiana bat.				

Federally Listed Species Impact Summary Table (List Each Species Within the County/Range)					
Scientific Name	Common Name	Listing	Anticipated Impacts		
			Alternative 1 No build	Alternative 2 Original Alignment	Alternative 3 Preferred Minimal Alignment
<i>Cyrogenia stegaria</i>	Fanshell	Endangered	None	None	None
<i>Lampsilis abrupta</i>	Pink mucket pearly mussel	Endangered	None	None	None
<i>Plethobasus cyphus</i>	Sheepnose	Endangered	None	None	None
<i>Epioblasma triquetra</i>	Snuffbox	Endangered	None	None	None
<i>Cryptobranchus alleganiensis</i>	Eastern hellbender	Species of Concern	None	None	None
<i>Crotalus horridus</i>	Timber rattlesnake	Species of Concern	None	Not Likely	Not Likely
<i>Haliaeetus leucocephalus</i>	Bald eagle	Species of Concern	None	Not Likely	Not Likely

For each species discuss the presence of, and anticipated impacts to, suitable habitats. The discussion should justify the level of anticipated impact.

The federally listed aquatic species with a known range that includes Washington County are the fanshell, pink mucket pearly mussel, sheepnose mussel, snuffbox, and the eastern hellbender. There will be no effect on any of these listed species because these animals require perennial flow and relatively clean substrates. The streams impacted by this project are ephemeral or intermittent at best and support no biology (aquatic macro-invertebrates or stream dwelling salamanders). In addition, the receiving stream beyond construction limits (New Year's Creek) is intermittent and does not support mussels. Furthermore, there are no known records for these species in Duck Creek, the receiving waters of New Year's Creek.

Impacts to the bald eagle are not likely as there are no known nesting sites within one half mile of the project area and because there will be no supercanopy trees near large water bodies removed during construction.

Foraging habitat for the timber rattlesnake (mixed deciduous upland forest) will be impacted by this project. However, crevices suitable for hibernaculum were not found as the sandstone outcroppings were sparse and comprised of friable and easily erodible material (filling voids and crevices). To date, timber rattlesnake occurrences in Washington County are anecdotal only. No timber rattlesnakes were observed during the field surveys and long-term property owners rarely see snakes at all, let alone timber rattlesnakes. The lack of scientifically documented records from Washington County in last 150 years or more is a good indication that the timber rattlesnake will likely not show up during construction.

STATE LISTED SPECIES IMPACTS	
Will any state listed species potentially be impacted by the project? (If NO, delete the State Listed Species Impact Table)	NO

For each species discuss the presence of, and anticipated impacts to, suitable habitats. The discussion should justify the level of anticipated impact.

Based on the ODNR Natural Heritage Database there are no known records for state or federal listed species within 1 mile of the project area. Several records occur just beyond 1 mile within the Muskingum River which is an entire drainage away. Impacts to state listed species are not anticipated.

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APPENDICIES**1- Figures**

- Project Location Mapping
- Literature Review Mapping Results
- Ecological Resource Mapping
- Other (List):

2 - Photographs

- Photograph Location Map
- Photographs

3 - Data Forms

- Stream Characterization/Assessment Data Forms
- Wetland Characterization/Assessment Data Forms
- Indiana Bat Habitat Characterization Worksheet
- Other (List):

4 – Agency Data Requests

- ODNR, Division of Natural Areas and Preserves – Natural Heritage Database Information Request
- USFWS – Federally Listed Species Information Request
- Other (List):