ATTACHMENT A

SUPPORTING DOCUMENTATION

FINAL

BASELINE/AFFECTED ENVIRONMENT DATA FOR SUPPLEMENTAL NEPA DOCUMENTATION, ALTERNATIVE DISPOSAL SITES, BLUESTONE DAM SAFETY MODIFICATION, HINTON, WEST VIRGINIA

Submitted to

U.S. Army Corps of Engineers
Huntington District
Huntington, West Virginia

Submitted by

4515 Shores Drive, Suite 200
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Final

Baseline/Affected Environment Data for Supplemental NEPA Documentation, Alternative Disposal Sites, Bluestone Dam Safety Modification, Hinton, West Virginia

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Submitted to

U.S. Army Corps of Engineers
Huntington District
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1. INTRODUCTION

The 2016 Bluestone Dam Safety Modification Supplemental Final Environmental Impact Statement (SFEIS) described proposed modifications to Bluestone Dam to reduce the risk of catastrophic dam failure. The description of the proposed construction activities noted that several disposal options for excavated rock and earthen material were being considered in the project's feasibility phase and would be refined during preconstruction engineering and design (PED). It also noted that supplemental National Environmental Policy Act (NEPA) documentation would be required for any potential disposal site alternatives other than a permitted landfill.

Four site disposal alternatives were identified for further analysis during PED (Figure 1-1). All of the sites are located well within the 40-mile radius originally analyzed in the 2016 Bluestone Dam Safety Modification SFEIS.

Desktop analysis and information from the 2016 Bluestone Dam Safety Modification SFEIS regarding relevant resources were utilized as a basis for analyzing existing conditions in the vicinity of the potential disposal sites. Site visits were then conducted in May 2018 to further assess site-specific existing conditions at all of the potential disposal sites, as well as the potential transportation routes to the sites.

This report summarizes the findings of the desktop review and site visits regarding the existing conditions at the sites. It also provides an analysis of potential environmental consequences to air quality, noise and transportation from the disposal of up to 250,000 cubic yards of earth and rock material from the dam at each of these sites. This report serves as supporting documentation to inform a forthcoming supplemental NEPA document regarding the disposal site alternatives.

2. BLUESTONE DAM DOWNSTREAM RIGHT AND LEFT BANK RECREATIONAL AREAS DISPOSAL SITES

2.1. Existing Conditions

2.1.1. Aquatic Resources

Within the right bank site, wetland and stream habitat is limited to a perennial stream that flows through the site from the east and into the eastern bank of the New River near the base of the dam (Figure 2-1). The stream is approximately three to five feet wide with flowing water at the time of the site survey (May 2018). As the stream

traverses through the site, the channel meanders down a steep slope then becomes channelized from the base of the slope to the New River. This stream would be considered jurisdictional “Waters of the U.S.”

Within the left bank site, a ditch exists from the edge of WV Route 20 to the dam access road. This ditch would not likely qualify as jurisdictional “Waters of the U.S.” or “Other Waters” (Figure 2-2).

2.1.2. Terrestrial Resources

The right bank disposal site consists of a small community park (Bellepoint Park) in the far northwest corner of the site, a construction laydown yard for the current construction activities at the dam in the center of the site, and a forested slope along the east side of the site. Habitat within the park and laydown yard is open and maintained lawn with scattered trees and shrubs along the bank of the river and throughout the site (Figure 2-3). Common species observed within these areas of the site include black locust (*Robinia pseudoacacia*), box elder (*Acer negundo*), red mulberry (*Morus rubra*), black cherry (*Prunus serotina*), sugar maple (*Acer saccharum*), American sycamore (*Platanus occidentalis*), American elm (*Ulmus americana*), Eastern red cedar (*Juniperus virginiana*), and river birch (*Betula nigra*). Some of these same species were also observed in the sapling/shrub stratum as well as autumn olive (*Elaeagnus umbellata*), and smooth sumac (*Rhus glabra*). Additionally, other species such as grape (*Vitis sp*.), Virginia creeper (*Parthenocissus quenquifolia*), Japanese honeysuckle (*Lonicera japonica*), multiflora rose (*Rosa multiflora*), and wine raspberry ((*Rubus phoenicolasius*) are present within this area of the site.

Along the east side of the right bank disposal site, the habitat consists of a slope hardwood forest with overstory species such as box elder, American sycamore, red mulberry, sugar maple, black locust, yellow buckeye (*Aesculus flava*), pignut hickory (*Carya glabra*), mockernut hickory (*Carya tomentosa*), American elm, hackberry (*Celtis occidentalis*), silver maple (*Acer saccharinum*), chestnut oak (*Quercus montana*), white oak (*Quercus alba)*, and northern red oak (*Quercus rubra)*.

Invasive species identified throughout the site included autumn olive, Japanese honeysuckle, Chinese privet (*Ligustrum sinense*), winged euonymus (*Euonymus alata*), empress tree (*Paulownia tomentosa*), wine raspberry, Japanese knotweed (*Polygonum cuspidatum*), bull thistle (*Cirsium vulgare*), Japanese stiltgrass (*Microstegium vimineum*), garlic mustard (*Alliaria petiolate*), and Japanese barberry (*Berberis thunbergii*).

On the left bank site, the northern two-thirds of the site is slope forest habitat with dominant overstory species such as box elder, sugar maple, yellow buckeye, black

walnut (*Juglans nigra*), and hackberry. Understory species included eastern redbud (*Cercis canadensis*), smooth sumac, box elder, sugar maple, yellow buckeye, multiflora rose, Japanese honeysuckle, amur peppervine (*Ampelopsis brevipedunculata*), and common moonseed (*Menispermum canadense*).

The southern third of the site includes a steep slope that is maintained as a shrub/herbaceous habitat and a small graveled parking area. The vegetation community is dominated by various grasses, Medicago sp., purple crown-vetch (*Coronilla varia*), Rumex sp., white clover (*Trifolium repens*), Lespedeza sp., bull thistle, and wild geranium (*Geranium maculatum*). Woody species such as box elder, smooth sumac, American elm, and black locust along with the other species previously listed dominate the upper half of the slope (Figure 2-4).

Invasive species found throughout the left bank site include purple crown-vetch, bull thistle, wine raspberry, Japanese honeysuckle, and multiflora rose.

2.1.3. Threatened and Endangered Species

The 2016 Bluestone Dam Safety Modification SFEIS provides a detailed description of the federal and state listed threatened and endangered plant and wildlife species known to exist within the project area and their preferred habitat. Table 2-1 provides a list of these species and their listing status.

Table 2-1. Federal and State-Listed Threatened and Endangered Plant and Wildlife Species

Common Name	Scientific Name	Federal Status	State Status
Running buffalo clover	*Trifolium stoloniferum*	Endangered	Endangered (WV, VA)
Virginia spiraea	*Spiraea virginiana*	Threatened	Threatened (WV, VA)
Peters mountain mallow	*Iliamna corei*	Endangered	Endangered (VA)
Bentley's coralroot	*Corallorhiza bentleyi*	n/a	Endangered (VA)
Long-stalked holly	*Ilex collina*	n/a	Endangered (VA)
Indiana bat	*Myotis sodalis*	Endangered	Endangered (WV)
Virginia big-eared bat	*Corynorhinus townsendii virginianus*	Endangered	Endangered (WV)
Northern long-eared bat	*Myotis septentrionalis*	Threatened	n/a
Peregrine falcon	*Falco peregrinus*	n/a	Threatened (VA)

The western portion of the right bank site does not contain suitable habitat for the federally listed bat species. However, the slope forest along the east side of the right bank site and the left bank site could provide suitable foraging habitat for the listed bat species and could possibly provide summer roosting habitat. However, there were no caves or mine openings observed within either site which could serve as hibernacula for these species.

Neither site provides suitable habitat for the peregrine falcon or listed plant species and no individuals of the listed plant species were observed within these disposal sites.

2.1.4. Air Quality

The right and left bank sites are located within Summers County, which is in attainment for all National Ambient Air Quality Standards (NAAQS) (USEPA 2018). The right bank site is adjacent to numerous residences within the town of Bellepoint along Riverside Drive, Miller Avenue, and Cedar Avenue and Bellepoint Park. No residences are located adjacent to the left bank site.

2.1.5. Noise

As described in the 2016 Bluestone Dam Safety Modification SFEIS, the ambient noise at Bluestone Dam within the right and left bank sites varies continuously and is composed of sounds from distant sources that are relatively steady, such as the flow of water through the dam, and of other sources, such as traffic sounds along WV Route 20 and ongoing construction at Bluestone Dam, that vary significantly in duration and magnitude. The CSX railroad line is located just north of Bellepoint and loud noises associated with horn blowing, diesel engines etc., while intermittent, also contribute to the ambient noise environment in the area. While there are no sensitive noise receptors in the area of the left bank site, several homes and a park which could potentially be affected by noise impacts from disposal activities are adjacent to the right bank site and transportation routes (Figure 2-5).

2.1.6. Transportation

In order to reach the left bank site, disposal material would be hauled from the dam along approximately 1.25 miles on Miller Road in Bellepoint, 0.4 miles on WV Route 3, and 0.4 miles on WV Route 20 (Figure 2-5). Miller Avenue is a local, paved, two-lane road, and both WV Route 3 and WV Route 20 are paved, two lane, minor arterial roads. While no traffic counts are readily available for Miller Road, Table 2-2 provides available traffic counts for the portions of WV Route 3 and WV Route 20 that would be utilized for transportation between the left and right banks.

Table 2-2. Average Annual Daily Traffic Counts on WV Route 3 and WV Route 20 in Vicinity of Disposal Sites

Road	Location	Average Annual Daily Traffic	Year(s) of Traffic Count(s)
WV Route 3	East of WV Route 20, east of New River	6847	2011
WV Route 3	East of WV Route 20, crossing New River	4665	2011
WV Route 20	0.1 mile south of junction with WV Route 3	2065-3067	1997-2015

Source: WVDOT 2018.

No state highways or local roads, with the exception of the portion of Miller Avenue traversing Bellepoint Park on the right bank, would be utilized if the right bank site is selected for use (Figure 2-6).

2.2. Environmental Consequences

2.2.1. Air Quality

Disposal of earth and rock material would take place intermittently throughout the eight to ten-year dam modification construction period. Transportation and disposal of earth and rock material could have long-term, non-permanent impacts to air quality similar to ongoing construction at the dam, including emissions from transportation vehicles and fugitive dust from rock crushing and material placement.

Adjacent to the right descending bank disposal site are several homes and recreational areas which could potentially be affected by air emissions from disposal activities. However, this site has been used for construction related activities for several years and certain potential air impacts to adjacent residences could be mitigated using on-site measures and BMPs such as using water to minimize dust.

There are approximately 50 homes, a convenience store with gas station, other small businesses, and a Methodist Church along the transportation route between the dam and the left bank site which could potentially be affected by air emissions from the transportation of material to the disposal site.

Potential air quality emissions for construction activities were calculated and compared to General Conformity Rule de minimis thresholds (100 tons per year) (USEPA 2016) in the 2016 Bluestone Dam Safety Modification SFEIS. These calculations included emissions from vehicles used to transport disposal material

from the construction site. This 2016 analysis and the assumptions used are provided in Appendix B. Given that the assumptions used in the 2016 analysis are consistent with the disposal plan alternatives described in this report, emissions levels described in the SFEIS would not be exceeded if the left or right bank sites are selected for use and would not exceed de minimis levels. No indirect impacts to air quality are expected.

2.2.2. Noise

The 2016 Bluestone Dam Safety Modification SFEIS provided a-weighted (dBA) sound levels of typical construction equipment and their associated modeled attenuation at various distances, based on data from the Federal Highway Administration (FHWA 2007). Dump truck and grader use associated with the transportation, dumping, and leveling of disposal material would be expected to emit approximately 76 to 85 dBA at a distance of 50 feet of the equipment and approximately 50 to 59 dBA at a distance of 1,000 feet of the equipment. Noise receptors such as the houses and recreation areas adjacent to the right bank site would be expected to experience these noise levels during the activities described in the 2016 SFEIS, including disposal of earth and rock material at the left and right bank sites.

Residences located 100 feet away from any roads used for hauling would have noise impacts of up to 70 dBA and residences located 200 feet away would have noise impacts up to 65 dBA. While the noise levels are not sufficient to cause damage to hearing or pose a health risk, these noise levels could temporarily and adversely affect the quality of life for Bellepoint residents. These impacts would contribute to the long-term, non-permanent, moderate adverse impacts on the ambient noise environment caused by the overall Bluestone Dam Safety Modification project.

2.2.3. Transportation

As no local roads or highways would be utilized, there should be no impacts associated with transporting disposal materials to the right bank site. Hauling of disposal material to the left bank site would intermittently increase traffic on the portions of Miller Avenue, WV Route 3, and WV Route 20 used for transportation of material. Assuming 20 cubic yards of disposal material could be carried in each dump truck load, 12,500 truck trips would be required to disposal of 250,000 cubic yards of material. These trips would be intermittent over a period of eight to ten years.

Proper signage and traffic controls would be utilized to limit the impact of haul truck entrance and exit on other vehicles utilizing WV Route 20. Appropriate fugitive dust

minimization measures, such as use of water to control dust, would be utilized to limit potential impacts to visibility on adjacent roadways including Miller Avenue and WV Route 20. Transportation impacts would be further mitigated by limiting the truck traffic through Bellepoint residential areas to the hours of 9:00 a.m. to 2:00 p.m., Monday through Friday.

This increase in construction related traffic would contribute to the overall long-term, non-permanent, moderate impact on transportation caused by the overall Bluestone Dam Safety Modification project.

3. PROPERTY DISPOSAL SITE

3.1. Existing Conditions

3.1.1. Aquatic Resources

A narrow flowing stream, ranging from two to three feet wide, traverses the site from north to south (Figure 3-1). This stream has a sandy gravel substrate with larger rocks along the sides and a depth of approximately three to eight inches within the site. Outside of this site, this stream merges with Surveyors Creek, a tributary of the Bluestone River. A few small herbaceous wetland habitats, the largest being 0.05 acres in size, are situated intermittently along the sides of the stream, such as the wetland site surveyed as shown in Figure 3-1. Appendix C contains wetland identification data sheets from the May 2018 site visit corresponding to the plots shown in Figure 3-1. These habitats consist of species such as golden ragwort (*Packera aurea*), soft rush (*Juncus effusus*), squarrose sedge (*Carex squarrosa*), false nettle (*Boehmeria cylindrica*), and Christmas fern (*Polystichum acrostichoides*).

3.1.2. Terrestrial Resources

Situated within a valley, this site consists of a hardwood forest with a small creek traversing through the center of the valley (Figure 3-2). The northern quarter of the site has an overstory dominated by pignut hickory, white ash (*Fraxinus americana*), black walnut, Northern red oak, black cherry, black locust, sugar maple, and yellow poplar (*Lirodendron tulipifera*). An opening of the overstory canopy in the uppermost portion of the site has allowed the growth of an understory of smooth sumac, autumn olive, Chinese privet, multiflora rose, and black locust which is denser than the understory of the lower three quarters of the site.

The southern portion of the site has a more mature and closed canopy dominated by white oak, American beech (*Fagus grandifolia*), sugar maple, and yellow buckeye. Understory species within the southern three-quarters of the site include autumn

olive, yellow buckeye, sugar maple, witch hazel (*Hamamelis virginiana*), flowering dogwood (*Cornus florida*), spice bush (*Lindera benzoinz*), and multiflora rose.

Several invasive species exist within this site with the majority of these species being more abundant in the northern portion of the site where the canopy is more open. Invasive species on the site include multiflora rose, autumn olive, wine raspberry, Chinese privet, Japanese honeysuckle, and Morrow's honeysuckle (*Lonicera maackii*).

3.1.3. Threatened and Endangered Species

Table 2-1 provides a list of federal and state listed species and their listing status. Suitable habitat for the listed plant species or peregrine falcon does not occur within the site, and no individuals were observed during the site survey. Being situated within a hardwood forest community, this disposal site could provide suitable foraging habitat for the federally listed bat species. However, there were no caves or mine openings observed within the site that would provide suitable hibernacula for these species. Neither individual bats nor suitable roosting habitat were observed during the site survey.

3.1.4. Air Quality

This site is located within Summers County, which is in attainment for all NAAQS (USEPA 2018). Several residences and other buildings exist within the grassed areas just east and west of the site, as well as the secondary transportation route from the dam to the site as described in Section 3.1.6.

3.1.5. Noise

This site is located within a rural portion of the county, with very limited development outside of the nearby Leatherwood Campground (one-quarter mile east of the site). Thus, the ambient noise in and around the site is limited to occasional vehicular traffic on Surveyor Branch Road and Bluestone Park Road. Numerous sensitive noise receptors, primarily residences, exist along the secondary northern transportation route (Figure 3-3).

3.1.6. Transportation

Two different routes between the dam and this site could potentially be used to transport disposal material: a primary southern route and a secondary northern route (Figure 3-3). The southern route includes approximately 2.8 miles on WV Route 20, 1.8 miles on Bluestone Park Road, 0.2 miles on Fork Ridge Road, and 0.25 miles on an unnamed road to the site for a total of approximately 5.05 miles.

The northern route includes 0.4 miles on WV Route 20, 4.8 miles on Leatherwood Road, 1.0 mile on Surveyor Branch Road, 0.5 miles on Bluestone Park Road, 0.2 miles on Fork Ridge Road, and 0.25 miles on an unnamed road to the site for a total of approximately 7.15 miles.

WV Route 20 and Bluestone Park Road are two-lane, well maintained and are in good condition. WV Route 20 is classified as a minor arterial road and Bluestone Park Road is classified as a minor collector road. Fork Ridge Road and the unnamed road to the site are one-lane gravel roads with no shoulders.

Leatherwood Road, on the secondary northern route, winds up and over a ridge and includes many curves on smaller roads through rural residential neighborhoods, including several school bus stops and a few bridges. After turning off of WV Route 20 onto Leatherwood Road, there is a sign that states, “Not Suitable for Large Trucks.” Thus, the southern route would be the preferred access route.

There is one active construction site along the southern route. On the south side of Bluestone Park Road, approximately 1,200 ft west of WV Route 20, there is an access road that leads to the northern base of the Route 20 bridge over Bluestone River. If this construction is ongoing during dam material hauling and disposal, some coordination with the construction contractor may be required, but would not preclude use of this route.

Table 3-1 provides available traffic counts for the portions of the roads that would be utilized for transportation to the site. Table 3-2 provides available truck traffic counts for a portion of WV Route 20 and Bluestone Park Road. Truck traffic counts were not readily available for other portions of the transportation routes.

Table 3-1. Average Annual Daily Traffic Counts on WV Route 3, WV Route 20, Leatherwood Road and Bluestone Park Road in Vicinity of Disposal Sites

Road	Location	Average Annual Daily Traffic	Year(s) of Traffic Count(s)
WV Route 3	East of WV Route 20, east of New River	6847	2011
WV Route 3	East of WV Route 20, crossing New River	4665	2011
WV Route 20	0.1 mile south of junction with WV Route 3	2065-3067	1997-2015
Leatherwood Road	0.1 mile west of WV Route 20	140-258	1997-2015
WV Route 20	0.7 mile south of Leatherwood Road	1801-2354	2003-2015
Bluestone Park Road	0.6 mile west of WV Route 20	147-446	1997-2003

Source: WVDOT 2018.

Table 3-2. Average Annual Daily Truck Traffic Counts on WV Route 20 and Bluestone Park Road in Vicinity of Disposal Sites

Road	Location	Average Annual Daily Truck Traffic	Year(s) of Traffic Count(s)
WV Route 20	0.7 mile south of Leatherwood Road	110 -175	2003-2015
Bluestone Park Road	0.6 mile west of WV Route 20	4 - 22	2003-2015

Source: WVDOT 2018.

3.2. Environmental Consequences

3.2.1. Air Quality

Disposal of earth and rock material would take place intermittently throughout the eight to ten-year dam modification construction period. Transportation and disposal of earth and rock material could have long-term, non-permanent impacts to air quality, including emissions from transportation vehicles and fugitive dust from rock crushing and material placement.

Adjacent to the site are several homes which could potentially be affected by air impacts from disposal activities. However, potential air impacts to adjacent residences could be mitigated using on-site measures such as using water to minimize dust. If the secondary transportation route along Leatherwood Road were utilized, adjacent receptors could be subject to increased vehicle emissions.

Air quality emissions for construction activities were calculated and described in the 2016 Bluestone Dam Safety Modification SFEIS and compared to the General Conformity Rule de minimis thresholds (100 tons per year) (USEPA 2016). These calculations included emissions from vehicles used to transport disposal material from the construction site; therefore, emissions levels described in the SFEIS would not be exceeded if this site is selected for use and would not exceed de minimis levels. No indirect impacts to air quality are expected.

3.2.2. Noise

The 2016 SFEIS provided a-weighted (dBA) sound levels of typical construction equipment and their associated modeled attenuation at various distances, based on data from the Federal Highway Administration (FHWA 2007). Dump truck and grader use associated with the transportation, dumping, and leveling of disposal material would be expected to emit noise levels of approximately 76 to 85 dBA at a distance of 50 feet of the equipment and approximately 50 to 59 dBA at a distance of 1,000 feet of the equipment. Wildlife may temporarily avoid adjacent habitat during material placement due to equipment associated noise. Noise receptors such as the houses and buildings adjacent to the site would be expected to experience these noise levels. Residences located 100 feet away from any roads used for hauling would have noise impacts of up to 70 dBA and residences located 200 feet away would have noise impacts up to 65 dBA. These impacts would cause long-term, non-permanent, moderate adverse impacts on ambient noise environment at the site and to receptors along the transportation route.

3.2.3. Transportation

Assuming 20 cubic yards of disposal material could be carried in each dump truck load, 12,500 truck trips would be required to disposal of 250,000 cubic yards of material. These trips would be intermittent over a period of eight to ten years.

Hauling of disposal material to this site would increase truck traffic on the portions of Miller Avenue, WV Route 3, WV Route 20 and other routes used for transportation of disposal material. Proper signage and traffic controls would be utilized to limit the impact of haul truck entrance and exit on other vehicles. Transportation impacts would be further mitigated by limiting the truck traffic through Bellepoint residential areas to the hours of 9:00 a.m. to 2:00 p.m., Monday through Friday.

This increase in construction related traffic would contribute to the overall long-term, non-permanent, moderate impact on transportation in the immediate vicinity of the dam caused by the overall Bluestone Dam Safety Modification project, and would cause long-term, non-permanent, moderate impact on transportation the portions of WV Route 20 and other routes not otherwise used for the project.

4. PROPERTY DISPOSAL SITE

4.1. Existing Conditions

4.1.1. Aquatic Resources

Wetland resources within this site include a small wetland seep along the lower half of the north slope of the site (Figure 4-1). This 0.21-acre herbaceous wetland is dominated by field horsetail (*Equisetum arvense*), broadleaf cattail (*Typha latifolia*), soft rush, woolgrass (*Scuirpus cyperinus*), and Virginia strawberry (*Fragaria virginiana*). Sapling/shrub species occurring within this wetland habitat included black willow (*Salix nigra*), black locust, and American sycamore. Appendix C contains a wetland identification data sheet from the May 2018 site visit corresponding to the plot shown in Figure 4-1. This seep drains into a small sediment basin located at the base of the slope within the site. Vegetation surrounding the sediment basin is very similar to the wetland seep, with a higher density of shrubs than the seep. Additionally, two smaller herbaceous wetlands are located adjacent to the intermittent drainage ditch along the southern portion of the site. These wetlands are small areas with vegetation similar to vegetation within the wetland seep on the north slope of the site.

Two intermittent drainage ditches, likely conveying storm water around the site, are located along the boundaries of the site. One ditch begins along the eastern side of the site traversing around the southern end of the site and back to the access road

along the northwest side of the site. The second ditch begins at the northern end of the site between the access road and the site, then traverses to the west along the access road. Neither of these ditches would likely be considered jurisdictional "Waters of the U.S." or "Other Waters."

4.1.2. Terrestrial Resources

This site was previously utilized as a disposal site for previous construction activities, creating a level top with steep slopes to the north and west of the site. The majority of the site is maintained as an open herbaceous habitat with common species such as smooth bromegrass (*Bromus inermis*), white clover, red clover (*Trifolium pratense*), Medicago sp., and Lespedeza sp. (Figure 4-2). Along the north facing slope, the vegetative community is similar to the top of the site with the addition of vetch and big leaf aster. The lower portion of the slope transitions into a wetland seep containing species such as soft rush, blue arrows rush (*Juncus inflexus*), field horsetail, broadleaf cattail, with scattered occurrences of black willow. A small portion of the northeast corner of the site is forested with mature white oak, pignut hickory, sugar maple, and yellow poplar. Understory species within this corner include red maple (*Acer rubrum*), sugar maple, and flowering dogwood.

Steep forested slopes occur along the eastern and southern sides of the site. These slope forests have an overstory dominated by white oak, shagbark hickory (*Carya ovata*), pignut hickory, northern red oak, yellow poplar, and yellow buckeye.

Invasive species on the site include wine raspberry, autumn olive, bull thistle, garden yellow rocket (*Barbarea vulgaris*), great mullein (*Verbascum thapsus*), multiflora rose, Morrow's honeysuckle, and Japanese stilt grass (*Microstegium vimineum*). These invasive species are generally located along the edges of the site.

4.1.3. Threatened and Endangered Species

Table 2-1 provides a list of federal and state listed species and their listing status. The site does not contain any suitable habitat for federal or state listed plant or wildlife species and no individuals of these species were observed during the site survey.

4.1.4. Air Quality

This site is located within Summers County, which is in attainment for all NAAQS (USEPA 2018). This site will generally use the same transportation route as described for the site. Several residences exist along the secondary transportation route from the dam to the site as described in Section 3.1.6. One

residence exists approximately 350 feet north of the site and another residence exists approximately 950 feet southwest of the site.

4.1.5. Noise

Like the site, this site is located within a rural portion of the county with limited development in the vicinity. Ambient noise in and around the site is limited to occasional vehicular traffic on Surveyor Branch Road and Leatherwood Road.

4.1.6. Transportation

Two different routes between the dam and site could potentially be used to transport disposal material: a northern route and a southern route. The southern route includes approximately 2.6 miles on WV Route 20,1.8 miles on Bluestone Park Road, and 0.6 miles on Surveyor Road for a total of 5.0 miles.

The northern route 0.4 miles on Route 20, 4.8 miles on Leatherwood Road, and 1.0 mile on Surveyor Branch Road to the site for a total of 6.2 miles.

As described in Section 2.1.6, the southern route would be the preferred access route and has been used for transportation of disposal material at this site in the past.

There is one active construction site along the southern route. On the south side of Bluestone Park Road, approximately 1,200 ft west of Route 20, there is an access road that leads to the northern base of the Route 20 bridge over Bluestone River. If this construction is ongoing during dam material hauling and disposal, some coordination with the construction contractor may be required, but would not preclude use of this route.

Table 3-1 provides available traffic counts for the portions of the roads that would be utilized for transportation to the site. Table 3-2 provides available truck traffic counts for a portion of WV Route 20 and Bluestone Park Road. Truck traffic counts were not readily available for other portions of the transportation routes.

4.2. Environmental Consequences

4.2.1. Air Quality

Disposal of earth and rock material would take place intermittently throughout the eight to ten-year dam modification construction period. Transportation and disposal

of earth and rock material could have long-term, non-permanent impacts to air quality, including emissions from transportation vehicles and fugitive dust from rock crushing and material placement.

The two homes within the vicinity of this site could potentially be affected by air impacts from disposal activities. However, potential air impacts to adjacent residences could be mitigated using on-site measures such as using water to minimize dust. If the secondary transportation route along Leatherwood Road were utilized, adjacent receptors could be subject to increased vehicle emissions.

Air quality emissions for construction activities were calculated and described in the 2016 Bluestone Dam Safety Modification SFEIS and compared to the General Conformity Rule de minimis thresholds (100 tons per year) (USEPA 2016). These calculations included emissions from vehicles used to transport disposal material from the construction site; therefore, emissions levels described in the SFEIS would not be exceeded if this site is selected for use and would not exceed de minimis levels. No indirect impacts to air quality are expected.

4.2.2. Noise

The 2016 SFEIS provided a-weighted (dBA) sound levels of typical construction equipment and their associated modeled attenuation at various distances, based on data from the Federal Highway Administration (FHWA 2007). Dump truck and grader use associated with the transportation, dumping and leveling of disposal material would be expected to emit approximately 76 to 85 dBA at a distance of 50 feet of the equipment and approximately 50 to 59 dBA at a distance of 1,000 feet of the equipment. Wildlife may temporarily avoid adjacent habitat during material placement due to equipment associated noise. Noise receptors north and southwest of the site would be expected to experience these noise levels. Residences located 100 feet away from any roads used for hauling would have noise impacts of up to 70 dBA and residences located 200 feet away would have noise impacts up to 65 dBA. These impacts would cause long-term, non-permanent, moderate adverse impacts on ambient noise environment in the vicinity of the site and to receptors along the transportation route.

4.2.3. Transportation

Assuming 20 cubic yards of disposal material could be carried in each dump truck load, 12,500 truck trips would be required to disposal of 250,000 cubic yards of material. These trips would be intermittent over a period of eight to ten years.

Hauling of disposal material to this site would increase truck traffic on the portions of Miller Avenue, WV Route 3, WV Route 20 and other routes used for transportation of

disposal material. Proper signage and traffic controls would be utilized to limit the impact of haul truck entrance and exit on other vehicles. Transportation impacts would be further mitigated by limiting the truck traffic through Bellepoint residential areas to the hours of 9:00 a.m. to 2:00 p.m., Monday through Friday.

This increase in construction related traffic would contribute to the overall long-term, non-permanent, moderate impact on transportation in the immediate vicinity of the dam caused by the overall Bluestone Dam Safety Modification project, and would cause long-term, non-permanent, moderate impact on transportation the portions of WV Route 20 and other routes not otherwise used for the project.

5. REFERENCES

USEPA. 2016. General Conformity De Minimis Levels. Internet URL: https://www.epa.gov/general-conformity/de-minimis-tables. Accessed June 20, 2018.

USEPA. 2018. West Virginia Nonattainment/Maintenance Status for Each County by Year for All Criteria Pollutants. Internet URL: https://www3.epa.gov/airquality/greenbook/anayo_wv.html. Accessed June 20, 2018.

WV Department of Transportation (WV DOT), WV DOT Traffic Counts. Internet URL: http://geocounts.com/traffic/wvdoh/, Accessed June 20, 2018.

Appendix A

FIGURES

Figure 1-1: Alternative Disposal Sites

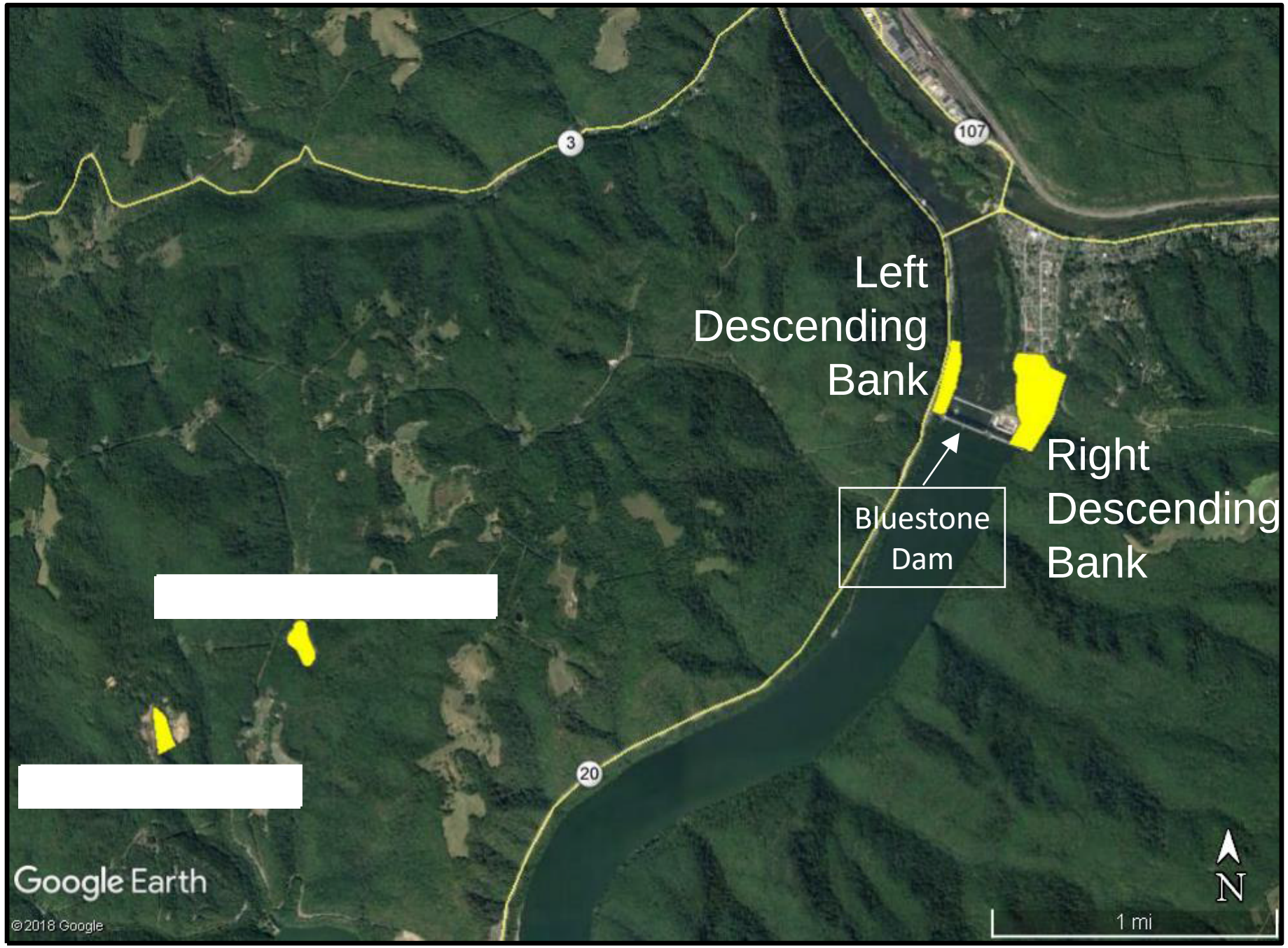

Figure 2-1: Right Bank Site Aquatic Resource Features

Figure 2-2: Left Bank Site Aquatic Resource Features

Figure 2-3: Left Bank Site Habitat Cover Types

Figure 2-4: Left Bank Site Cover Habitat Cover Types

Figure 2-5: Left Bank Site Transportation Route and Noise Receptors

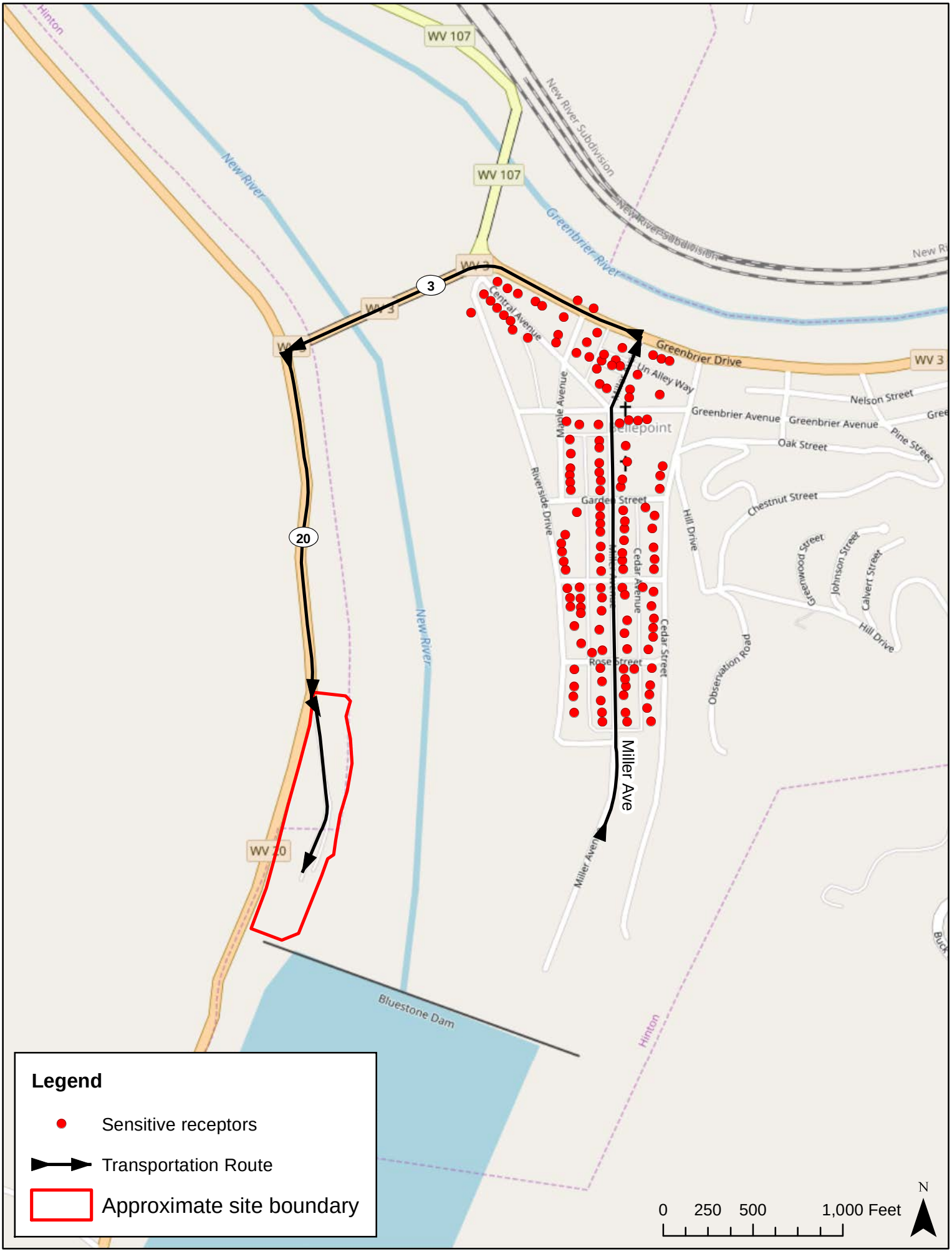

Figure 2-6: Right Bank Site Transportation Route

Figure 3-1: Site Aquatic Resource Features

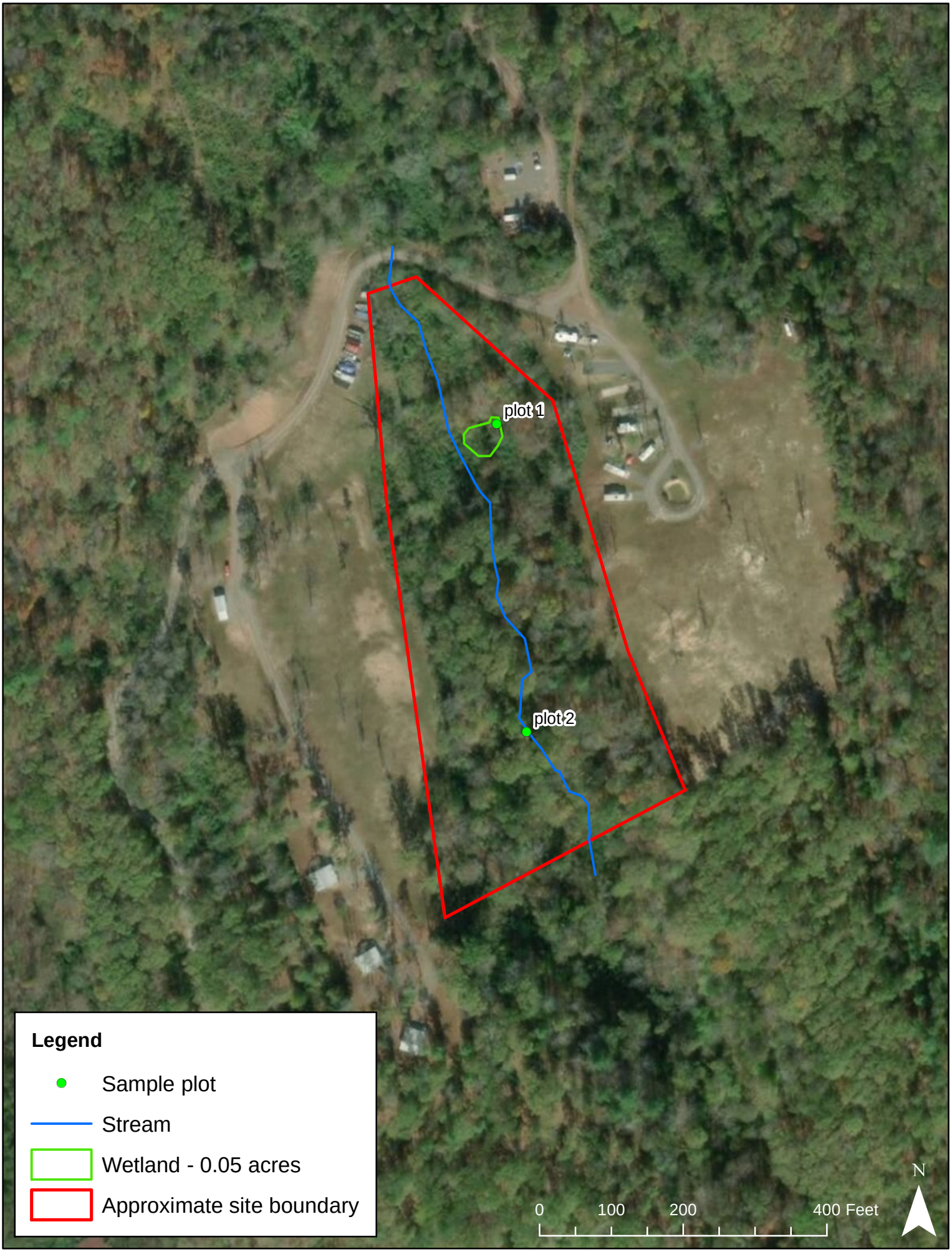

Figure 3-2: Site Habitat Cover Types

Figure 3-1: Af_pjgc @pmu l Site Transportation Route and Noise Receptors

Figure 4-1: Site Aquatic Resource Features

Figure 4-2: Site Habitat Cover Types

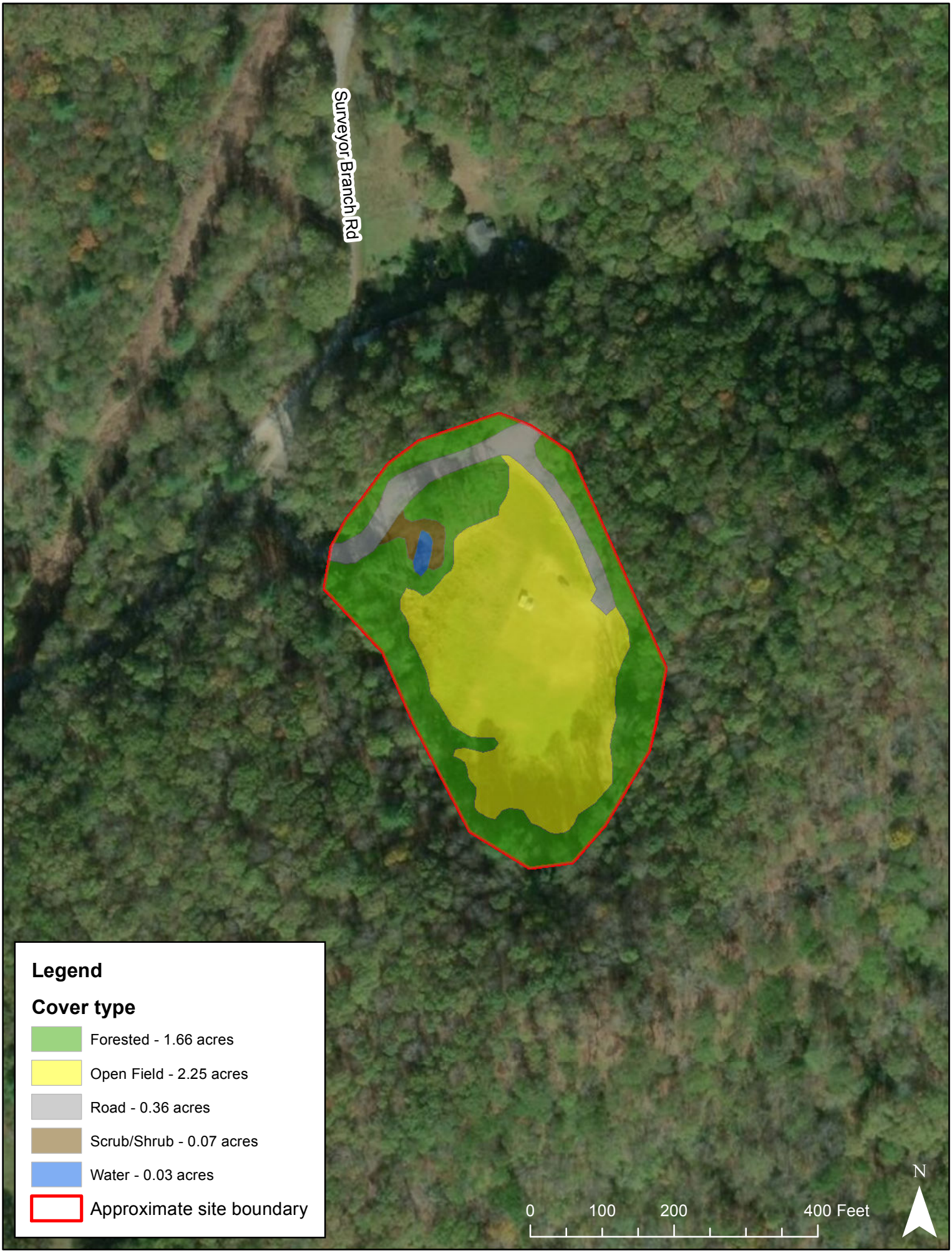

Figure 4-1: Site Transportation Route and Noise Receptors

Appendix B

2016 Bluestone Dam Safety Modification SFEIS Air Quality Analysis

Assumptions for Emissions - Construction Commuter and Trucking (on-road)					
Source	Fuel Type	Number of Vehicles	Miles Traveled per Day	Days of Travel per Year	Miles Traveled per Year
Passenger Cars	Gasoline	60	20	260	312,000
Passenger Trucks	Gasoline	60	20	260	312,000
Light Commercial Trucks	Gasoline	3	20	260	15,600
Light Commercial Trucks	Diesel	5	40	260	52,000
Short-Haul Trucks	Diesel	20	40	260	208,000
Long-Haul Trucks	Diesel	4	80	260	83,200

Short-Haul Trucks includes dump trucks and cement trucks
Long-Haul Trucks include semi-trailers

Construction Commuter and Trucking (on-road) Emissions (lbs/year) - Moves 2014a							
Source	**VOC**	**CO**	**NO_x**	**PM-10**	**PM-2.5**	**SO_2**	**CO_2 and CO_2 Equivalents**
Passenger Cars	3550	24861	2925	39	35	2	280889
Passenger Trucks	5791	41311	4865	49	43	2	316321
Light Commercial Trucks	447	3536	395	4	3	0	28670
Short-Haul Trucks	15	3770	335	13	12	1	85992
Long-Haul Trucks	10	2008	166	8	7	1	59523
Total	9813	75486	8686	113	100	6	771395

Construction Commuter and Trucking (on-road) Emissions (tons/year) - Moves 2014a							
Source	**VOC**	**CO**	**NO_x**	**PM-10**	**PM-2.5**	**SO_2**	**CO_2 and CO_2 Equivalents**
Passenger Cars	1.775	12.4305	1.4625	0.0195	0.0175	0.001	140.4445
Passenger Trucks	2.8955	20.6555	2.4325	0.0245	0.0215	0.001	158.1605
Light Commercial Trucks	0.2235	1.768	0.1975	0.002	0.0015	0	14.335
Short-Haul Trucks	0.0075	1.885	0.1675	0.0065	0.006	0.0005	42.996
Long-Haul Trucks	0.005	1.004	0.083	0.004	0.0035	0.0005	29.7615
Total	4.9065	37.743	4.343	0.0565	0.05	0.003	385.6975

Combustion Emissions (off-road) (tons/year) - Moves 2014a							
	VOC	**CO**	**$N0_x$**	**$S0_2$**	**$C0_2$**	**PM-10**	**PM-2.5**
lbs/day	2.883951	12.6451366	22.91798	0.031292	5550.409	1.897855	1.840919
lbs/year	720.9877	3161.284151	5729.494	7.822945	1387602	474.4636	460.2296
tons/year	0.360494	1.580642075	2.864747	0.003911	693.8011	0.237232	0.230115

Fugitive Dust Emissions (off-Road) (tons/year)				
	PM-10 uncontrolled	PM-10 controlled	PM-2.5 uncontrolled	PM-2.5 controlled
Construction Area (0.19 ton PM-10/acre)	11.4	5.7	1.14	0.57
Staging Areas	29.6	14.82	2.96	1.48
Total	**41**	**20.52**	**4.1**	**2.05**

Air Emissions Results							
	Criteria Pollutants (tons per year)						
Emission Source	**VOC**	**CO**	**$N0_x$**	**PM-10**	**PM-2.5**	**SO_2**	**CO_2 and CO_2 Equivalents**
Combustion Emissions (off-road)	0.360494	1.580642075	2.864747	0.237232	0.230115	0.003911	693.8011
Construction Site-Fugitive Dust	NA	NA	NA	20.52	2.05	NA	NA
Construction Commuter & Trucking (on-road)	4.9065	37.743	4.343	0.0565	0.05	0.003	385.6975
Total Emissions	**5.266994**	**39.32364208**	**7.207747**	**20.813732**	**2.330115**	**0.006911**	**1079.4986**
De Minimis Threshold (1)	100	100	100	100	100	100	25,000

(1) Summers County is in attainment for all NAAQS; 40 CFR 93 Part 153 defines de minimis levels or the minimum threshold for which a conformity must be performed for various criteria pollutant.

On-road and off-road emissions were generated by USEPA preferred model MOVES2014a. MOVES simulates daily motor vehicle operations and produces emissions rates. MOVES emission rates include sources from engine combustion, tire wear, brake wear, evaporative fuel permeation, vapor venting and leaking (running and parking), and crankcase loss. Emissions rates are averages from a combination of vehicle operations such as: stop and go, highway travel, acceleration at on-ramps, parking, start-up, extended idle, etc. Emissions for nonroad equipment were modeled for the 2014 year. The VOC Emission Factors includes exhaust and evaporative emissions.

Data for some MOVES modeling inputs were gathered from West Virginia Department of Environmental Protection emissions inventory technical documentation (WVDEP 2011).

Construction Fugitive Dust Emissions

Construction Fugitive Dust Emission Factors

	Emission Factor	Units	Source
General Construction Activities	0.19	ton PM-10/acre-month	MRI 1996; EPA 2001; EPA 2006
New Road Construction	0.42	ton PM-10/acre-month	MRI 1996; EPA 2001; EPA 2006

PM2.5 Emissions

PM2.5 Multiplier	0.10	(10% of PM-10 emissions Assumed to be PM-2.5)	EPA 2001; EPA 2006
Control Efficiency	0.50	(assume 50% control Efficiency for PM-10 and PM-2.5 emissions)	EPA 2001; EPA 2006

Construction Area (0.19 ton PM10/acre-month)

Duration of Soil Disturbance in Project Area	12	months
Area	5	acres

Conversion Factors

0.000022957	acres per sq. feet

Staging Areas

Duration of Soil Disturbance in Project Area	12	months
Area	13	acres

Project Emissions (tons/year)				
	PM-10 uncontrolled	PM-10 controlled	PM-2.5 uncontrolled	PM-2.5 controlled
Construction Area (0.19 ton PM 10/acre-month)	11.4	5.7	1.14	0.57
Staging Area	29.6	14.82	2.96	1.48
Total	**41**	**20.52**	**4.1**	**2.05**

References:

EPA 2001. *Procedures Document for National Emissions Inventory, Criteria Air Pollutants*, 1985-1999. EPA-454/R-01-006. Office of Air Quality Planning and Standards, United States Environmental Protection Agency. March 2001.

EPA 2006. *Documentation for the Final 2002 Nonpoint Sector (Feb. 2006 version) National Emission Inventory for Criteria and Hazardous Air Pollutants.* Prepared for: Emissions Inventory and Analysis Group (C339-02) Air Quality Assessment Division Office of Air Quality Planning and Standards, United States Environmental Protection Agency. July 2006.

MRI 1996. *Improvement of Specific Emission Factors (BACM Project No. 1).* Midwest Research Institute (MRI). Prepared for the California South Coast Air Quality Management District, March 29, 1996.

Construction Fugitive Dust Emission Factors

General Construction Activities Emission Factor

0.19 ton PM10/acre-month Source: MRI 1996; EPA 2001; EPA 2006

The area-based emission factor for construction activities is based on a study completed by the Midwest Research Institute (MRI) Improvement of Specific Emission Factors (BACM Project No.1), March 29, 1996. The MRI study evaluated seven construction projects in Nevada and California (Las Vegas, Coachella Valley, South Coast Air Basin, and the San Joaquin Valley). The study determined an average emission factor of 0.11 ton PM10/acre-month for sites without large-scale cut/fill operations. A worst-case emission factor of 0.42 ton PM10/acre-month was calculated for sites with active large-scale earth moving operations. The monthly emission factors are based on 168 work-hours per month (MRI 1996). A subsequent MRI Report in 1999, Estimating Particulate Matter Emissions from Construction Operations, calculated the 0.19 ton PM10/acre-month emission factor by applying 25% of the large-scale earthmoving emission factor (0.42 ton PM10/acre-month) and 75% of the average emission factor (0.11 ton PM10/acre-month).

The 0.19 ton PM10/acre-month emission factor is referenced by the EPA for non-residential construction activities in recent procedures documents for the National Emission Inventory (EPA 2001; EPA 2006). The 0.19 ton PM10/acre-month emission factor represents a refinement of EPA's original AP-42 area-based total suspended particle (TSP) emission factor in Section 13.2.3 Heavy Construction Operations. In addition to the EPA, this methodology is also supported by the South Coast Air Quality Management District and the Western Regional Air Partnership (WRAP) which is funded by the EPA and is administered jointly by the Western Governor's Association and the National Tribal Environmental Council. The emission factor is assumed to encompass a variety of non-residential construction activities including building construction (commercial, industrial, institutional, governmental), public works, and travel on unpaved roads. The EPA National Emission Inventory documentation assumes that the emission factors are uncontrolled and recommends a control efficiency of 50% for PM10 and PM2.5 in PM nonattainment areas.

PM2.5 Multiplier **0.10**

PM2.5 emissions are estimated by applying a particle size multiplier of 0.10 to PM10 emissions. This methodology is consistent with the procedures documents for the National Emission Inventory (EPA 2006).

Control Efficiency for PM10 and PM2.5 **0.50**

The EPA National Emission Inventory documentation recommends a control efficiency of 50% for PM10 and PM2.5 in PM nonattainment areas. Wetting controls will be applied during project construction (EPA 2006).

References:

EPA 2001. Procedures Document for National Emissions Inventory, Criteria Air Pollutants, 1985-1999. EPA-454/R-01-006. Office of Air Quality Planning and Standards, United States Environmental Protection Agency. March 2001.

EPA 2006. Documentation for the Final 2002 Nonpoint Sector (Feb 06 version) National Emission Inventory for Criteria and Hazardous Air Pollutants. Prepared for: Emissions Inventory and Analysis Group (C339-02) Air Quality Assessment Division Office of Air Quality Planning and Standards, United States Environmental Protection Agency. July 2006.

MRI 1996. Improvement of Specific Emission Factors (BACM Project No. 1). Midwest Research Institute (MRI). Prepared for the California South Coast Air Quality Management District, March
29, 1996.

Appendix C

Wetland Identification Field Data Sheets

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Bluestone - Charlie Brown Disposal Site City/County: Summers Sampling Date: May 21, 2018

Applicant/Owner: USACE, Huntington District State: WV Sampling Point: 1

Investigator(s): B. McCoy, S. Knaus, B. Lopez Section, Township, Range:

Landform (hillslope, terrace, etc.): Forested Valley Local relief (concave, convex, none): valley Slope (%): 1-2%

Subregion (LRR or MLRA): LRR N Lat: 37.62611842 Long: -80.93838225 Datum: NAD 83

Soil Map Unit Name: Cateache silt loam, 3-15% slopes NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes [X] No [ ] (If no, explain in Remarks.)

Are Vegetation [ ], Soil [ ], or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes [X] No [ ]

Are Vegetation [ ], Soil [ ], or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes [X]	No [ ]	**Is the Sampled Area within a Wetland?** Yes [X] No [ ]
Hydric Soil Present?	Yes [X]	No [ ]	
Wetland Hydrology Present?	Yes [X]	No [ ]	

Remarks: Community type: Select from list

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- [X] Surface Water (A1)
- [X] High Water Table (A2)
- [X] Saturation (A3)
- [ ] Water Marks (B1)
- [ ] Sediment Deposits (B2)
- [ ] Drift Deposits (B3)
- [ ] Algal Mat or Crust (B4)
- [ ] Iron Deposits (B5)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [ ] Aquatic Fauna (B13)
- [ ] True Aquatic Plants (B14)
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres on Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Tilled Soils (C6)
- [ ] Thin Muck Surface (C7)
- [ ] Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- [ ] Surface Soil Cracks (B6)
- [ ] Sparsely Vegetated Concave Surface (B8)
- [ ] Drainage Patterns (B10)
- [ ] Moss Trim Lines (B16)
- [ ] Dry-Season Water Table (C2)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [ ] Stunted or Stressed Plants (D1)
- [ ] Geomorphic Position (D2)
- [ ] Shallow Aquitard (D3)
- [ ] Microtopographic Relief (D4)
- [ ] FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes [X]	No [ ]	Depth (inches): 1-2
Water Table Present?	Yes [X]	No [ ]	Depth (inches): 4
Saturation Present? (includes capillary fringe)	Yes [X]	No [ ]	Depth (inches): 0

Wetland Hydrology Present? Yes [X] No [ ]

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: 1

Tree Stratum (Plot size: 30 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Carya glabra.*	20	Yes	FACU
2. *Liriodendron tulipefera*	15	Yes	FACU
3. *Prunus serotina*	10	Yes	FACU
4. *Robinia pseudoacacia*	5	No	FACU
5.			
6.			
7.			
8.			
	50	= Total Cover	
Sapling/Shrub Stratum (Plot size: 30 ft radius)			
1. *Robinia pseudoacacia*	15	No	FACU
2. *Elaeagnus umbellata*	40	Yes	FACU
3. *Rosa multiflora*	35	Yes	FACU
4. *Ligustrum sinense*	5	No	FACU
5. *Rubus sp.*	30	Yes	
6.			
7.			
8.			
9.			
10.			
	125	= Total Cover	
Herb Stratum (Plot size: 5 ft radius)			
1. *Juncus effusus*	5	No	FACW
2. *Carex squarrosa*	25	Yes	FACW
3. *Boehmeria cylindrica*	5	No	FACW
4. *Typha latifolia*	1	No	OBL
5. *Packera aurea*	3	No	FACW
6. *Polystichum acrostichoides*	1	No	FACU
7.			
8.			
9.			
10.			
11.			
12.			
	45	= Total Cover	
Woody Vine Stratum (Plot size: 30 ft radius)			
1. *Parthenocissus quinquefolia*	1	Yes	FACU
2. *Vitis rotundifolia*	1	Yes	FAC
3. *Lonicera japonica*	2	Yes	FACU
4.			
5.			
6.			
	4	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 10 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 10 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic vegetation is based on the herbaceous vegetation within the boundaries of the area identified as wetland habitat. Other vegetation recorded was within the plot but not necessarily within the wetland habitat.

SOIL

Sampling Point: 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 4/2	99	10YR 3/4	1	C	M	Silt Loam	
3-18+	10YR 4/1	99	10YR 3/6	2	C	M	Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10) **(LRR N)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7)
- ☐ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ☐ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ☐ Umbric Surface (F13) **(MLRA 136, 122)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 148)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) **(MLRA 147)**
- ☐ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Bluestone - Charlie Brown Disposal Site City/County: Summers Sampling Date: May 21, 2018

Applicant/Owner: USACE, Huntington District State: WV Sampling Point: 2

Investigator(s): B. McCoy, S. Knaus, B. Lopez Section, Township, Range:

Landform (hillslope, terrace, etc.): Forested Valley Local relief (concave, convex, none): hillslope Slope (%): 2-5%

Subregion (LRR or MLRA): LRR N Lat: 37.62494106 Long: -80.93823945 Datum: NAD 83

Soil Map Unit Name: Shouns silt loam, 15-30% slopes, very stony NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes [X] No [ ] (If no, explain in Remarks.)

Are Vegetation [ ], Soil [ ], or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes [X] No [ ]

Are Vegetation [ ], Soil [ ], or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes [ ]	No [X]	**Is the Sampled Area within a Wetland?** Yes [ ] No [X]
Hydric Soil Present?	Yes [ ]	No [X]	
Wetland Hydrology Present?	Yes [ ]	No [X]	

Remarks: Community type: Select from list

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- [ ] Surface Water (A1)
- [ ] High Water Table (A2)
- [ ] Saturation (A3)
- [ ] Water Marks (B1)
- [ ] Sediment Deposits (B2)
- [ ] Drift Deposits (B3)
- [ ] Algal Mat or Crust (B4)
- [ ] Iron Deposits (B5)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [ ] Aquatic Fauna (B13)
- [ ] True Aquatic Plants (B14)
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres on Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Tilled Soils (C6)
- [ ] Thin Muck Surface (C7)
- [ ] Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- [ ] Surface Soil Cracks (B6)
- [ ] Sparsely Vegetated Concave Surface (B8)
- [ ] Drainage Patterns (B10)
- [ ] Moss Trim Lines (B16)
- [ ] Dry-Season Water Table (C2)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [ ] Stunted or Stressed Plants (D1)
- [ ] Geomorphic Position (D2)
- [ ] Shallow Aquitard (D3)
- [ ] Microtopographic Relief (D4)
- [ ] FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes [ ]	No [X]	Depth (inches):
Water Table Present?	Yes [ ]	No [X]	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes [ ]	No [X]	Depth (inches):

Wetland Hydrology Present? Yes [ ] No [X]

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: 2

Tree Stratum (Plot size: 30 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus alba*	55	Yes	FACU
2. *Fagus grandifolia*	30	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
	80	= Total Cover	
Sapling/Shrub Stratum (Plot size: 30 ft radius)			
1. *Elaeagnus umbellata*	25	Yes	FACU
2. *Acer saccharum*	1	No	FACU
3. *Aesculus flava*	2	No	FACU
4. *Hamamelis virginiana*	2	No	FACU
5. *Rosa multiflora*	35	Yes	FACU
6. *Cornus florida*	1	No	FACU
7. *Lindera benzoin*	2	No	FAC
8.			
9.			
10.			
	68	= Total Cover	
Herb Stratum (Plot size: 5 ft radius)			
1. *Packera aurea*	75	Yes	FACW
2. *Carex squarrosa*	15	No	FACW
3. *Polystichum acrostichoides*	2	No	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	92	= Total Cover	
Woody Vine Stratum (Plot size: 30 ft radius)			
1. *Smilax rotundifolia*	1	Yes	FAC
2. *Vitis rotundifolia*	1	Yes	FAC
3.			
4.			
5.			
6.			
	2	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 43 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	1	x 1 =	1
FACW species	4	x 2 =	8
FAC species	1	x 3 =	3
FACU species	11	x 4 =	44
UPL species		x 5 =	
Column Totals:	17 (A)		56 (B)

Prevalence Index = B/A = 3.29

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☐ No ☒

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 3/3	100					Clay Loam	
2-4	10YR 3/4	100					Clay Loam	
4-7	10YR 4/3	100					Loamy Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10) **(LRR N)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7)
- ☐ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ☐ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ☐ Umbric Surface (F13) **(MLRA 136, 122)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 148)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) **(MLRA 147)**
- ☐ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks:

Rocks at 7" prevented collecting a soil profile any deeper.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Bluestone - Charlie Brown Disposal Site City/County: Summers Sampling Date: May 21, 2018

Applicant/Owner: USACE, Huntington District State: WV Sampling Point: 3

Investigator(s): B. McCoy, S. Knaus, B. Lopez Section, Township, Range:

Landform (hillslope, terrace, etc.): Forested Hillslope Local relief (concave, convex, none): hillslope Slope (%): 2-5%

Subregion (LRR or MLRA): LRR N Lat: 37.62630906 Long: -80.93843328 Datum: NAD 83

Soil Map Unit Name: Cateache silt loam, 3-15% slopes NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes [X] No [ ] (If no, explain in Remarks.)

Are Vegetation [ ], Soil [ ], or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes [X] No [ ]

Are Vegetation [ ], Soil [ ], or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes [ ]	No [X]	**Is the Sampled Area within a Wetland?** Yes [ ] No [X]
Hydric Soil Present?	Yes [ ]	No [X]	
Wetland Hydrology Present?	Yes [ ]	No [X]	

Remarks: Community type: Select from list

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- [ ] Surface Water (A1)
- [ ] High Water Table (A2)
- [ ] Saturation (A3)
- [ ] Water Marks (B1)
- [ ] Sediment Deposits (B2)
- [ ] Drift Deposits (B3)
- [ ] Algal Mat or Crust (B4)
- [ ] Iron Deposits (B5)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [ ] Aquatic Fauna (B13)
- [ ] True Aquatic Plants (B14)
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres on Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Tilled Soils (C6)
- [ ] Thin Muck Surface (C7)
- [ ] Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- [ ] Surface Soil Cracks (B6)
- [ ] Sparsely Vegetated Concave Surface (B8)
- [ ] Drainage Patterns (B10)
- [ ] Moss Trim Lines (B16)
- [ ] Dry-Season Water Table (C2)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [ ] Stunted or Stressed Plants (D1)
- [ ] Geomorphic Position (D2)
- [ ] Shallow Aquitard (D3)
- [ ] Microtopographic Relief (D4)
- [ ] FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes [ ]	No [X]	Depth (inches):
Water Table Present?	Yes [ ]	No [X]	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes [ ]	No [X]	Depth (inches):

Wetland Hydrology Present? Yes [ ] No [X]

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: 3

Tree Stratum (Plot size: 30 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus rubra*	20	Yes	FACU
2. *Acer saccharum*	25	Yes	FACU
3. *Carya glabra*	30	Yes	FACU
4. *Viburnum prunifolium*	10	No	FACU
5. *Fraxinus americana*	5	No	FACU
6.			
7.			
8.			
	90	= Total Cover	

Sapling/Shrub Stratum (Plot size: 30 ft radius)			
1. *Elaeagnus umbellata*	25	Yes	NI
2. *Rhus glabra*	5	No	NI
3. *Ligustrum sinense*	20	Yes	FACU
4. *Rosa multiflora*	35	Yes	FACU
5.			
6.			
7.			
8.			
9.			
10.			
	85	= Total Cover	

Herb Stratum (Plot size: 5 ft radius)			
1. *Lonicera maackii*	2	No	NI
2. *Polystichum acrostichoides*	3	No	FACU
3. *Lonicera japonica*	10	Yes	FACU
4. *Smilax rotundifolia*	2	No	FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	17	= Total Cover	

Woody Vine Stratum (Plot size: 30 ft radius)			
1. *Smilax rotundifolia*	1	No	FAC
2. *Lonicera japonica*	10	Yes	FAC
3. *Parthenocissus quenquifolia*	15	Yes	FACU
4.			
5.			
6.			
	26	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 9 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 11 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☐ No ☒

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 4/3	100					Clay Loam	
3-7	10YR 5/3	100					Clay Loam	
7-15+	10YR 5/4	100					Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10) **(LRR N)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7)
- ☐ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ☐ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ☐ Umbric Surface (F13) **(MLRA 136, 122)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 148)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) **(MLRA 147)**
- ☐ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Bluestone - Meredith Bennett Disposal Site City/County: Summers Sampling Date: May 22, 2018

Applicant/Owner: USACE, Huntington District State: WV Sampling Point: 1

Investigator(s): B. McCoy, S. Knaus, B. Lopez Section, Township, Range:

Landform (hillslope, terrace, etc.): Herbaceous Hillslope Local relief (concave, convex, none): Steep Slope Slope (%): 30-40

Subregion (LRR or MLRA): LRR N Lat: 37.62965746 Long: -80.92960419 Datum: NAD 83

Soil Map Unit Name: Shouns silt loam, 15-30% slopes NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes [X] No [ ] (If no, explain in Remarks.)

Are Vegetation [ ], Soil [ ], or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes [X] No [ ]

Are Vegetation [ ], Soil [ ], or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes [X]	No [ ]	**Is the Sampled Area within a Wetland?** Yes [X] No [ ]
Hydric Soil Present?	Yes [X]	No [ ]	
Wetland Hydrology Present?	Yes [X]	No [ ]	

Remarks: Community type: Select from list

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- [X] Surface Water (A1)
- [X] High Water Table (A2)
- [X] Saturation (A3)
- [ ] Water Marks (B1)
- [ ] Sediment Deposits (B2)
- [ ] Drift Deposits (B3)
- [ ] Algal Mat or Crust (B4)
- [ ] Iron Deposits (B5)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [ ] Aquatic Fauna (B13)
- [ ] True Aquatic Plants (B14)
- [ ] Hydrogen Sulfide Odor (C1)
- [X] Oxidized Rhizospheres on Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Tilled Soils (C6)
- [ ] Thin Muck Surface (C7)
- [ ] Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- [ ] Surface Soil Cracks (B6)
- [ ] Sparsely Vegetated Concave Surface (B8)
- [ ] Drainage Patterns (B10)
- [ ] Moss Trim Lines (B16)
- [ ] Dry-Season Water Table (C2)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [ ] Stunted or Stressed Plants (D1)
- [ ] Geomorphic Position (D2)
- [ ] Shallow Aquitard (D3)
- [ ] Microtopographic Relief (D4)
- [ ] FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes [X]	No [ ]	Depth (inches): 1
Water Table Present?	Yes [X]	No [ ]	Depth (inches): 5
Saturation Present? (includes capillary fringe)	Yes [X]	No [ ]	Depth (inches): surface

Wetland Hydrology Present? Yes [X] No [ ]

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: 1

Tree Stratum (Plot size: 30 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Aesculus flava*	10	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	10 = Total Cover		
Sapling/Shrub Stratum (Plot size: 30 ft radius)			
1. *Salix nigra*	15	Yes	OBL
2. *Platanus occidentalis*	2	No	FACW
3. *Robinia pseudoacacia*	15	Yes	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	32 = Total Cover		
Herb Stratum (Plot size: 5 ft radius)			
1. *Typha latifolia*	10	Yes	OBL
2. *Juncus effusus*	10	Yes	FACW
3. *Juncus inflexus*	10	Yes	FACW
4. *Scirpus cyperinus*	3	No	FACW
5. *Rumex acetosella*	3	No	UPL
6. *Erigeron philadelphicus*	3	No	FACU
7. *Equisetum arvense*	35	Yes	FAC
8. *Fragaric virginiana*	7	No	FACU
9.			
10.			
11.			
12.			
	81 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft radius)			
1.			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 71% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-2	7.5YR 4/2	100					Silt Loam	
2-5	10YR 4/2	98	10YR 4/4	1	C	M	Clay Loam	
			10YR 3/6	1	C	M	Clay Loam	
5-18+	10YR 4/2	50					Clay Loam	Disturbed Matrix
	10YR 3/4	50						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10) **(LRR N)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7)
- ☐ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ☐ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ☐ Umbric Surface (F13) **(MLRA 136, 122)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 148)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) **(MLRA 147)**
- ☐ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks:

National Flood Hazard Layer FIRMette

FEMA

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 7/23/2018 at 3:36:11 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

USACE FILE NO./ Project Name: (v2.1, Sept 2015)	Bluestone Dam	IMPACT COORDINATES: (in Decimal Degrees)	Lat.	37.641	Lon.	-80.883	WEATHER:	Sunny	DATE:	9/25/2018
IMPACT STREAM/SITE ID AND SITE DESCRIPTION: (watershed size (acreage), unaltered or impairments)	Packs Branch	MITIGATION STREAM CLASS./SITE ID AND SITE DESCRIPTION: (watershed size (acreage), unaltered or impairments)					Perennial, Forested/Agriculture		Comments:	
STREAM IMPACT LENGTH:	330	FORM OF MITIGATION:		MIT COORDINATES: (in Decimal Degrees)	Lat.		Lon.		PRECIPITATION PAST 48 HRS:		Mitigation Length:	

Column No. 1- Impact Existing Condition (Debit)			
Stream Classification:	Perennial		
Percent Stream Channel Slope	4		
HGM Score (attach data forms):			
			Average
Hydrology			0
Biogeochemical Cycling			
Habitat			
PART I - Physical, Chemical and Biological Indicators			
	Points Scale	Range	Site Score
PHYSICAL INDICATOR (Applies to all streams classifications)			
USEPA RBP (High Gradient Data Sheet)			
1. Epifaunal Substrate/Available Cover	0-20	0-1	5
2. Embeddedness	0-20		6
3. Velocity/ Depth Regime	0-20		8
4. Sediment Deposition	0-20		6
5. Channel Flow Status	0-20		6
6. Channel Alteration	0-20		1
7. Frequency of Riffles (or bends)	0-20		7
8. Bank Stability (LB & RB)	0-20		18
9. Vegetative Protection (LB & RB)	0-20		1
10. Riparian Vegetative Zone Width (LB & RB)	0-20		1
Total RBP Score	Poor		59
Sub-Total			0.295
CHEMICAL INDICATOR (Applies to Intermittent and Perennial Streams)			
WVDEP Water Quality Indicators (General)			
Specific Conductivity			
100-199 - 85 points	0-90	0-1	
pH			
5.6-5.9 = 45 points	0-80		
DO			
	10-30		
Sub-Total			
BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams)			
WV Stream Condition Index (WVSCI)			
0	0-100	0-1	
Sub-Total			0

PART II - Index and Unit Score		
Index	Linear Feet	Unit Score
0.548	330	180.675

Column No. 2- Mitigation Existing Condition - Baseline (Credit)			
Stream Classification:	Intermittent		
Percent Stream Channel Slope	5		
HGM Score (attach data forms):			
			Average
Hydrology			0
Biogeochemical Cycling			
Habitat			
PART I - Physical, Chemical and Biological Indicators			
	Points Scale	Range	Site Score
PHYSICAL INDICATOR (Applies to all streams classifications)			
USEPA RBP (High Gradient Data Sheet)			
1. Epifaunal Substrate/Available Cover	0-20	0-1	
2. Embeddedness	0-20		
3. Velocity/ Depth Regime	0-20		
4. Sediment Deposition	0-20		
5. Channel Flow Status	0-20		
6. Channel Alteration	0-20		
7. Frequency of Riffles (or bends)	0-20		
8. Bank Stability (LB & RB)	0-20		
9. Vegetative Protection (LB & RB)	0-20		
10. Riparian Vegetative Zone Width (LB & RB)	0-20		
Total RBP Score	Poor		0
Sub-Total			0
CHEMICAL INDICATOR (Applies to Intermittent and Perennial Streams)			
WVDEP Water Quality Indicators (General)			
Specific Conductivity			
	0-90	0-1	
pH			
	5-90		
DO			
	10-30		
Sub-Total			0
BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams)			
WV Stream Condition Index (WVSCI)			
	0-100	0-1	
Sub-Total			0

PART II - Index and Unit Score		
Index	Linear Feet	Unit Score
0	0	0

Column No. 3- Mitigation Projected at Five Years Post Completion (Credit)			
Stream Classification:	Intermittent		
Percent Stream Channel Slope	5		
HGM Score (attach data forms):			
			Average
Hydrology			0
Biogeochemical Cycling			
Habitat			
PART I - Physical, Chemical and Biological Indicators			
	Points Scale	Range	Site Score
PHYSICAL INDICATOR (Applies to all streams classifications)			
USEPA RBP (High Gradient Data Sheet)			
1. Epifaunal Substrate/Available Cover	0-20	0-1	
2. Embeddedness	0-20		
3. Velocity/ Depth Regime	0-20		
4. Sediment Deposition	0-20		
5. Channel Flow Status	0-20		
6. Channel Alteration	0-20		
7. Frequency of Riffles (or bends)	0-20		
8. Bank Stability (LB & RB)	0-20		
9. Vegetative Protection (LB & RB)	0-20		
10. Riparian Vegetative Zone Width (LB & RB)	0-20		
Total RBP Score	Poor		0
Sub-Total			0
CHEMICAL INDICATOR (Applies to Intermittent and Perennial Streams)			
WVDEP Water Quality Indicators (General)			
Specific Conductivity			
	0-90	0-1	
pH			
	5-90		5
DO			
	10-30		
Sub-Total			0
BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams)			
WV Stream Condition Index (WVSCI)			
	0-100	0-1	
Sub-Total			0

PART II - Index and Unit Score		
Index	Linear Feet	Unit Score
0	0	0

Column No. 4- Mitigation Projected at Ten Years Post Completion (Credit)			
Stream Classification:	Intermittent		
Percent Stream Channel Slope	5		
HGM Score (attach data forms):			
			Average
Hydrology			0
Biogeochemical Cycling			
Habitat			
PART I - Physical, Chemical and Biological Indicators			
	Points Scale	Range	Site Score
PHYSICAL INDICATOR (Applies to all streams classifications)			
USEPA RBP (High Gradient Data Sheet)			
1. Epifaunal Substrate/Available Cover	0-20	0-1	
2. Embeddedness	0-20		
3. Velocity/ Depth Regime	0-20		
4. Sediment Deposition	0-20		
5. Channel Flow Status	0-20		
6. Channel Alteration	0-20		
7. Frequency of Riffles (or bends)	0-20		
8. Bank Stability (LB & RB)	0-20		
9. Vegetative Protection (LB & RB)	0-20		
10. Riparian Vegetative Zone Width (LB & RB)	0-20		
Total RBP Score	Poor		0
Sub-Total			0
CHEMICAL INDICATOR (Applies to Intermittent and Perennial Streams)			
WVDEP Water Quality Indicators (General)			
Specific Conductivity			
	0-90	0-1	
pH			
	5-90		
DO			
	10-30		
Sub-Total			0
BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams)			
WV Stream Condition Index (WVSCI)			
	0-100	0-1	
Sub-Total			0

PART II - Index and Unit Score		
Index	Linear Feet	Unit Score
0	0	0

Column No. 5- Mitigation Projected at Maturity (Credit)			
Stream Classification:	Intermittent		
Percent Stream Channel Slope	5		
HGM Score (attach data forms):			
			Average
Hydrology			0
Biogeochemical Cycling			
Habitat			
PART I - Physical, Chemical and Biological Indicators			
	Points Scale	Range	Site Score
PHYSICAL INDICATOR (Applies to all streams classifications)			
USEPA RBP (High Gradient Data Sheet)			
1. Epifaunal Substrate/Available Cover	0-20	0-1	
2. Embeddedness	0-20		
3. Velocity/ Depth Regime	0-20		
4. Sediment Deposition	0-20		
5. Channel Flow Status	0-20		
6. Channel Alteration	0-20		
7. Frequency of Riffles (or bends)	0-20		
8. Bank Stability (LB & RB)	0-20		
9. Vegetative Protection (LB & RB)	0-20		
10. Riparian Vegetative Zone Width (LB & RB)	0-20		
Total RBP Score	Poor		0
Sub-Total			0
CHEMICAL INDICATOR (Applies to Intermittent and Perennial Streams)			
WVDEP Water Quality Indicators (General)			
Specific Conductivity			
	0-90	0-1	
pH			
	5-90		
DO			
	10-30		
Sub-Total			0
BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams)			
WV Stream Condition Index (WVSCI)			
	0-100	0-1	
Sub-Total			0

PART II - Index and Unit Score		
Index	Linear Feet	Unit Score
0	0	0

PART III - Impact Factors
(See instruction page to insert default values for MITIGATION BANKING and ILF)

Temporal Loss-Construction

**Note: Reflects duration of aquatic functional loss between the time of an impact (debit) and completion of compensatory mitigation (credit).*

Years	0
Sub-Total	0

Temporal Loss-Maturity

**Note: Period between completion of compensatory mitigation measures and the time required for maturity, as it relates to function (i.e. maturity of tree stratum to provide organic matter and detritus within riparian stream or wetland buffer corridor).*

% Add. Mitigation	Temporal Loss-Maturity (Years)
0%	0
Sub-Total	0

Long-term Protection

% Add. Mitigation and Monitoring Period	Long-Term Protection (Years)
0 + 5/10 Year Monitoring	101
Sub-Total	0

PART IV - Index to Unit Score Conversion

Final Index Score (Debit)	Linear Feet	Unit Score (Debit)	ILF Costs (Offsetting Debit Units)
0.5475	330	180.675	$144,540.00

PART V- Comparison of Unit Scores and Projected Balance

Final Unit Score (Debit) [No Net Loss Value]	180.675	Mitigation Existing Condition - Baseline (Credit)		Mitigation Projected at Five Years Post Completion (Credit)		Mitigation Projected at Ten Years Post Completion (Credit)		Mitigation Projected At Maturity (Credit)	
FINAL PROJECTED NET BALANCE					0		0		0

Part VI - Mitigation Considerations (Incentives)

Extent of Stream Restoration

***Note1: Reference the Instructional handout to determine the correct Restoration Levels (below) for your project**
***Note2: Place an "X" in the appropriate category (only select one).**

☐ Restoration Level 1	
☐ Restoration Level 2	
☐ Restoration Level 3	

Compensatory Mitigation Plan incorporates HUC 12-based watershed approach? (Yes or No) *Note: HUC 12-based watershed approach required to obtain Stream Restoration incentive	No

Extended Upland Buffer Zone

***Note[1]: Reference Instructional handout for the definitions of the Buffer Zone Mitigation Extents and Types (below)**
***Note[2]: Enter the buffer width for each channel side (Left Bank and Right Bank)**
***Note[3]: Select the appropriate mitigation type**

Buffer Width	Left Bank	
150	0-50	Preservation and Supplemental Planting
	51-150	Preservation
Buffer Width	**Right Bank**	
150	0-50	Preservation and Supplemental Planting
	51-150	Preservation
Average Buffer Width/Side	**150**	

Site	Impact Unit Yield (Debit)	Mitigation Unit Yield (Credit)
	180.675	#DIV/0!

Final Mitigation Unit Yield	Straight Preservation Ratio (v2.1, Sept 2015)
#DIV/0!	