



ALTERNATIVES ANALYSIS
CLEAN WATER ACT SECTION 404 PERMIT AND
SECTION 401 WATER QUALITY CERTIFICATION APPLICATION
AMERICAN ELECTRIC POWER CO., INC.
PROPOSED MITCHELL LANDFILL PROJECT
CRESAP, MARSHALL COUNTY, WEST VIRGINIA

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1.0 PROJECT DESCRIPTION AND PURPOSE

This document provides responses to the West Virginia Department of Environmental Protection (WVDEP) Clean Water Act (CWA) Section 401 Water Quality Certification Application and the CWA Section 404 Permit Application for the Ohio Power Company dba American Electric Power Company, Inc. (AEP) proposed Mitchell Landfill Project (the project area) located in Cresap, Marshall County, West Virginia. The project area is located on Gatts Ridge Road west of its intersection with Taylors Ridge Road (Figure 1) and consists of a proposed coal combustion byproducts landfill, a proposed haul road, and adjacent areas that may be impacted by soil borrow and other construction and operation activities.

The project purpose is to construct a residual solid waste landfill, complying with West Virginia Code of State Rules, Title 33, Series 1-Solid Waste Management Rule (33CSR1), within proximity to the Mitchell Plant located along the Ohio River. AEP has proposed construction of a landfill facility for long-term management of fly ash, bottom ash (including pulverizer rejects), synthetic gypsum, and Chloride Purge Stream (CPS) Filter Cake material created by the coal combustion process as well as the construction of a haul road to connect the existing haul road to the proposed coal combustion byproducts landfill. AEP anticipates the continued sale of synthetic gypsum for commercial purposes. However, providing airspace for all synthetic gypsum produced is a prudent approach if currently contracted synthetic gypsum sales are not realized. The proposed landfill design capacity must be large enough for a substantial design life in order to accommodate disposal of up to 10 million cubic yards of fly ash, bottom ash (including pulverizer rejects), CPS Filter Cake material, and synthetic gypsum produced at the Mitchell Plant. Assuming continued synthetic gypsum sales, the landfill design will provide disposal capacity for the Mitchell Plant for approximately 24 years.



2.0 REVIEW OF ALTERNATIVES

An alternatives analysis was prepared to present practicable alternatives to waterbody encroachments at the project area. An alternative is considered practicable if it is capable of being implemented after consideration of construction cost, existing technology, and logistics. Regulations require a demonstration that there are no other site designs that would eliminate wetland or other jurisdictional water impacts or have fewer impacts and still fulfill the basic project purpose.

After extensive consideration, AEP incorporated site design changes that ultimately led to the selection of a project area development alternative that has significantly reduced environmental impacts from the original project area configuration. The project area design changes included a relocation of the proposed landfill and attendant features, therefore reducing impacts to a larger amount of streams within the project area. No perennial streams will be impacted by the proposed landfill project.

The design criteria listed below were considered during the siting process and the preliminary design of the proposed landfill construction (Figure 2). The following components of the project are essential for the economic viability of the project and to achieve the project purpose:

1. The proposed landfill must meet the waste disposal needs of fly ash and bottom ash production, which includes a 24-year design life and capacity estimates of approximately 10 million cubic yards. This requires a landfill footprint of approximately 58 acres at the project area. AEP anticipates continued sales of the majority of the synthetic gypsum produced. However, providing airspace within the proposed landfill for all synthetic gypsum produced is a prudent approach if currently contracted synthetic gypsum sales are not realized due to market fluctuations, as is the case in the current economic climate.
2. The project area must be of sufficient size to include the estimated 58-acre landfill, with additional land required for buffer, access roads, soil borrow areas, soil stockpile areas, stormwater management structures, and related ancillary facilities.
3. Under West Virginia regulations, byproducts from AEP's Coal Combustion By-Products Facility will be classified as Class F solid waste in accordance with the West Virginia Code 22-15-1 et seq. (Title 33). The landfill will require recompacted soil for the bottom liner subbase and cap, a leachate collection system and appropriate engineering controls for stormwater and leachate management along with operation controls for interim cover, fugitive dust control and related features.



4. The proposed landfill should be located in an area that minimizes environmental and socioeconomic impacts to the region and is within proximity to the Mitchell Plant.
5. The development of the proposed landfill must be on appropriately zoned land.

2.1 ON-SITE ALTERNATIVES ANALYSIS

Two on-site alternatives have been evaluated as part of this analysis and include the Proposed Site Plan/Minimum Degradation Alternative (Figure 2) and the Original Site Plan/Maximum Degradation Alternative (Figure 3). A discussion of an on-site Non-Degradation Alternative is not included in this analysis as the Non-Degradation Alternative options within the Site do not represent realistic or technically feasible designs. Several off-site alternatives are discussed in the following sections in-lieu of a Non-Degradation Alternative.

A jurisdictional waters delineation study was performed by Civil & Environmental Consultants, Inc. (CEC) within the 301-acre project study area. The project study area included the Proposed Site Plan (Minimum Degradation Alternative) limits of disturbance, the Original Site Plan (Maximum Degradation Alternative) limits of disturbance, and the Proposed Phase II Haul Road limits of disturbance (Figure 4, Appendix A). These delineation efforts were completed by CEC as two separate studies. The first delineation study was conducted from August 11 to August 15, 2011, and on September 27 and 28, 2011, for the Proposed Site Plan (Minimum Degradation Alternative) limits of disturbance and the Original Site Plan (Maximum Degradation Alternative) limits of disturbance.

Thirty streams, totaling approximately 14,992 linear feet, were identified within the limits of disturbance associated with the Minimum and Maximum Degradation Alternatives, including 18 streams interpreted as ephemeral, two streams interpreted as intermittent, and ten streams interpreted as containing both ephemeral and intermittent reaches. The delineated streams generally drain in a southerly direction towards Little Tribble Creek and Fish Creek. Little Tribble Creek empties into Fish Creek, which flows west into the Ohio River. Two palustrine emergent wetlands (PEM), totaling approximately 0.02 acre, and one open water area, approximately 1 acre in size, were also identified within the limits of disturbance associated with the Minimum and Maximum Degradation Alternatives. All of the streams and the wetlands



within the limits of disturbance associated with the Minimum and Maximum Degradation Alternatives drain to Little Tribble Creek or Fish Creek, both of which have a significant nexus to a traditional navigable water (the Ohio River), and are therefore anticipated to be considered jurisdictional waters of the U.S. A preliminary jurisdictional determination (PJD) letter received from the U.S. Army Corps of Engineers (USACE) on November 15, 2012 (Appendix A), confirmed this interpretation. As seen on Figures 4 and 5 of the April 2, 2012 Jurisdictional Waters Delineation Report provided in Appendix A, a wetland and stream delineation was previously conducted by Stantec in 2011 within a Phase II Haul Road study area. AEP submitted Stantec's 2011 delineation report for the original Phase II Haul Road study area, along with a jurisdictional determination (JD) request cover letter, to the USACE on December 19, 2011.

Subsequent to the Stantec delineation study, the proposed limits of disturbance associated with construction of the Phase II Haul Road were expanded. A supplemental wetland and stream delineation study was completed by CEC in February 2012 for the expanded Phase II Haul Road limits of disturbance. That report was submitted to the USACE for review on March 16, 2012. Areas included within CEC's supplemental Phase II Haul Road wetland and stream delineation study area are shown with orange hatching on Figures 1 through 5 of the April 2, 2012 Jurisdictional Waters Delineation Report included in Appendix A and total approximately 22 acres.

CEC conducted additional stream sampling and wetland delineation activities within the limits of Stantec's Phase II Haul Road study area on March 20 and 21, 2012. On March 21, 2012, CEC and representatives from AEP conducted a JD site visit within the Phase II Haul Road portion of the project area with the USACE. Based on observations made by CEC during the March 20 and 21, 2012, site visits and requests made by the USACE during the March 21, 2012, JD site visit, the locations and/or classification of streams and the extent of wetlands within the Phase II Haul Road portion of the project area were updated. The USACE also requested that a single jurisdictional waters delineation report be compiled for the entire Phase II Haul Road portion of the project area. Therefore, the April 2, 2012 Jurisdictional Waters Delineation Report included in Appendix A was prepared to summarize the results of stream and wetland delineation studies



within the Phase II Haul Road portion of the project area as completed by CEC and incorporates the Stantec findings as field verified and/or updated by CEC in March 2012.

Stantec completed their field reconnaissance portion of the wetland and stream delineation within the Phase II Haul Road portion of the project area on August 22 and 23, 2011, and September 26 and 27, 2011. CEC conducted their field reconnaissance portion of the wetland and stream delineation within the Phase II Haul Road portion of the project area on February 14, 15, and 28, 2012, as well as on March 20 and 21, 2012.

Approximately 5,192 linear feet of stream consisting of 3,854 linear feet of ephemeral stream and 1,338 linear feet of intermittent stream were identified within the study area associated with the Phase II Haul Road portion of the project area. Stantec identified one wetland (Wetland K), totaling approximately 0.14 acre in size, within the Phase II Haul Road portion of the project area. However, this wetland is outside of the current planned limits of disturbance. Stream and wetland locations are shown on Figure 4. All of the streams and the wetland within the Phase II Haul Road portion of the Mitchell Landfill project area drain to the existing Conner Run impoundment and are therefore not anticipated to be considered jurisdictional waters of the U.S. due to the lack of a significant nexus between the Conner Run impoundment and traditional navigable waters. The USACE is in the process of preparing a formal JD letter to document the jurisdictional status of the streams and wetland within the Phase II Haul Road portion of the project area.

The following sections evaluate both on-site project alternatives as they relate to impacts to aquatic resources. Detailed descriptions of the environmental impacts associated with each on-site alternative are provided in Section 3.0 - Biological and Physical Impacts.

2.1.1 Alternative 1 – Minimum Degradation Alternative/Proposed Site Plan

Alternative 1 (Figure 2) represents the Proposed Site Plan and the Minimum Degradation Alternative. This plan represents a scaled-back version of the Original Site Plan/Maximum Degradation Alternative (Alternative 2; Figure 3) and was designed to minimize environmental



impacts. This alternative will provide the approximately 10 million cubic yards of airspace needed for waste disposal.

The Minimum Degradation Alternative/Proposed Site Plan includes a total of approximately 207.3 acres which is comprised of:

- 58 acres for the landfill footprint;
- 3 acres of stormwater ponds;
- 11.7 acres of roads;
- 16 acres of stockpile areas;
- 45 acres of disturbance associated with construction of the Phase II Haul Road; and
- 73.6 acres of potential additional disturbance associated with construction of the stormwater ponds, roads, landfill operation facilities, and other attendant features.

The limits of disturbance associated with the Minimum Degradation Alternative/Proposed Site Plan would impact two separate subwatersheds to Lower Fish Creek (12-digit hydrologic unit code 050301061208), including unnamed tributaries to the Conner Run Impoundment, unnamed tributaries to Fish Creek, and an unnamed tributary to Little Tribble Creek. Under this alternative, approximately 5,099 linear feet of intermittent stream, approximately 8,527 linear feet of ephemeral stream, approximately 1 acre of open water, and approximately 0.01 acre of wetland would be impacted. About 49 percent or 3,578 linear feet of the total ephemeral stream impacts and 1,338 linear feet or 26 percent of the total intermittent stream impacts are associated with the proposed Phase II Haul Road limits of disturbance and are therefore not anticipated to represent impacts to jurisdictional waters of the U.S.

The West Virginia Stream & Wetland Valuation Metric (SWVM) was utilized to evaluate stream impacts and compensatory mitigation requirements for the project. The SWVM is an automated debit/credit program that integrates individual stream assessments and key parameters for chemical, physical and biological components to assess stream conditions. The SWVM does not produce a linear stream footage ratio but instead produces a debit/credit score for each stream that will be impacted. The stream debits must be offset by stream credits. Based on the SWVM



and assuming the streams present within the Phase II Haul Road portion of the project area are not jurisdictional waters of the U.S., approximately 8,862 credits will need to be obtained to mitigate the loss of 8,710 linear feet of ephemeral and intermittent streams within the project area. A Conceptual Stream Mitigation Plan is provided in Appendix E. This alternative minimizes waterbody impacts while maximizing available acreage for landfill construction, making Alternative 1 the most viable of the on-site alternatives.

Direct economic benefits include the creation of approximately 3 to 6 permanent jobs and 8 to 16 temporary jobs with competitive wages, increased federal, state, and local income tax, and increased real estate tax. This design also intentionally avoids impacts to perennial streams.

2.1.2 Alternative 2 – Maximum Degradation Alternative/Original Site Plan

Alternative 2 (Figure 3) represents the Original Site Plan considered by AEP and the Maximum Degradation Alternative. This alternative encompasses 301 acres, including an approximately 98-acre landfill, 45 acres of disturbance associated with construction of the Phase II Haul Road, and approximately 158 acres of additional disturbance associated with four stormwater ponds, soil stockpile areas, soil borrow areas, access roads, etc. Alternative 2 was designed for ease of construction, while providing the airspace needed for waste disposal. Under the Maximum Degradation Alternative, the landfill would provide approximately 18 million cubic yards of airspace for waste disposal.

While the Maximum Degradation Alternative would meet the project purpose by providing adequate waste disposal for up to 24 years, the environmental impacts would be significantly greater than under Alternative 1 – Minimum Degradation Alternative/Proposed Site Plan. The Maximum Degradation Alternative would impact three separate subwatersheds to Lower Fish Creek (12-digit hydrologic unit code 050301061208), including unnamed tributaries to the Conner Run Impoundment, Little Tribble Creek, and Fish Creek. Under this alternative, approximately 10,243 linear feet of intermittent stream, 9,665 linear feet of ephemeral stream, 0.02 acre of wetland, and 1 acre of open water area would be impacted as part of the construction and operation of the Project. About 37 percent, or 3,578 linear feet of the total ephemeral stream



impacts, and 1,338 linear feet, or 13 percent of the total intermittent stream impacts, are associated with the proposed Phase II Haul Road and are therefore not anticipated to represent impacts to jurisdictional waters of the U.S.

2.1.3 Social and Economic Justification of On-Site Alternatives

The following table summarizes alternatives and associated social and economic information associated with the On-Site Alternatives.

Table 1. Social and Economic Considerations of the Minimum and Maximum Degradation Alternatives		
Social and Economic Considerations	Proposed Site Plan/Minimum Degradation Alternative	Original Site Plan/Maximum Degradation Alternative
No. of Residential Lots	Not Applicable	Not Applicable
New Permanent Jobs	3 to 6	3 to 6
Est. Payroll \$\$/yr	\$255,000 - \$510,000	\$353,400 - \$706,800
Est. Payroll Taxes/yr	\$102,000 - \$204,000	\$102,000 - \$204,000
New Temporary Jobs	8 to 16	9 to 18
Est. Temporary Payroll	\$780,000	\$877,500
Est. Temporary Taxes	\$312,000	\$351,000
Other Tax \$\$	\$1,500	\$1,500
Revenue Generated	Not Applicable	Not Applicable
Local Taxes Generated	\$1,500	\$1,500
State Taxes Generated	Not Applicable	Not Applicable
County Unemployment Rate	11.1% (2010 data)	11.1% (2010 data)
County Poverty Rate	18% (2010 data)	18% (2010 data)
Environmental Benefit	unknown	unknown
Social Benefit	None	None
Recreational Benefit	None	None
OTHER	None	None



2.1.4 Alternatives Analysis Summary

After conducting an evaluation of alternative site configurations, AEP has determined that the Proposed Site Plan under Alternative 1 most closely fits their project purpose and need. The location of the new landfill within proximity to the Mitchell Plant, the anticipated 24 year life expectancy, and the significantly reduced amount of intermittent and ephemeral stream impacts make the Proposed Site Plan the most viable. Direct economic benefits include the creation of approximately 3 to 6 permanent jobs and 8 to 16 temporary jobs with competitive wages, increased federal, state, and local income tax, and increased real estate tax.

Alternative 2, the Maximum Degradation Alternative, would also fulfill the project purpose and need and provide similar economic benefit as compared to Alternative 1, but with greater environmental impacts.

Alternative¹	Open Water Impacts (acres)	Wetland Impacts (acres)	Intermittent Stream Impacts (linear feet)	Ephemeral Stream Impacts (linear feet)	Land Disturbance (acres)
1. Minimum Degradation ¹	1.0	0.01	5,099	8,527	207.3
2. Maximum Degradation ¹	1.0	0.02	10,243	9,665	301

¹The total stream impacts include impacts to streams that are not expected to be considered jurisdictional waters of the U.S. associated with construction of the Phase II Haul Road.



2.2 OFF-SITE ALTERNATIVES ANALYSIS

The Off-Site Alternatives Analysis describes off-site scenarios considered by AEP. These include the Cardinal Landfill Site; the Mountaineer Landfill Site; the South Hills Landfill Site; and the Conner Run Fly Ash Retention Pond (Impoundment) Site. Figure 5 provides a regional map that identifies the locations considered in the Off-Site Alternatives Analysis. The following sections of the report outline the site locations and justification for not selecting each site for the project. In addition to fly ash and bottom ash disposal, AEP may need to dispose of synthetic gypsum. With regard to the potential need for disposal of gypsum, the primary off-site alternative to construction of a new landfill is for AEP to supply the gypsum to wallboard manufacturers. AEP currently provides the majority of the synthetic gypsum generated at the Mitchell Plant to a wallboard manufacturer. However, as stated previously, in addition to AEP having to design a landfill that would provide sufficient capacity for all fly ash and bottom ash produced by the Mitchell Plant, it is prudent for AEP to design a landfill that would also provide sufficient capacity for all gypsum produced by the Mitchell Plant in the event that gypsum demand does not continue.

2.2.1 Off-site Alternative 1 – Cardinal Landfill Site

The Cardinal Landfill Site is located at the Cardinal Power Plant in Brilliant, Ohio, and is approximately 50 miles north of the Mitchell Plant (Figure 5). This off-site alternative is not viable in the long-term because the Cardinal Landfill has a finite waste capacity and the additional waste would cause the Cardinal Landfill Site to deplete its current disposal capacity ahead of plan. Approximately 980,000 tons of fly ash, bottom ash, synthetic gypsum, and CPS filter cake are produced each year (approximately 2,685 tons/day) at the Mitchell Plant.

Additionally, the cost to transport the fly ash, bottom ash, gypsum, and CPS filter cake to this landfill is not economically feasible in the long term. AEP would pay approximately \$9.56 per ton for transport of fly ash, bottom ash, and gypsum from the Mitchell Plant to the Cardinal Landfill which amounts to approximately \$9,375,000 per year in transportation costs alone based on the estimated 980,000 tons of fly ash, bottom ash, gypsum, and CPS filter cake produced per



year at the Mitchell Plant. Also, hauling the waste to the landfill from the Mitchell Plant via trucks creates an environmental impact associated with trucking operations, contributes to noise pollution, and increases the potential for traffic accidents. The finite waste capacity and the costs and potential environmental impacts associated with the transport of the waste do not make Cardinal Landfill a viable off-site alternative for the long term.

2.2.2 Off-Site Alternative 2 – Mountaineer Landfill Site

The Mountaineer Landfill Site is located at the Mountaineer Power Plant in New Haven, West Virginia, and is approximately 130 miles south of the Mitchell Plant (Figure 5). This off-site alternative is not viable in the long-term because the Mountaineer Landfill has a finite waste capacity. As stated previously, approximately 980,000 tons of fly ash, bottom ash, gypsum, and CPS filter cake are produced each year (approximately 2,685 tons/day) at the Mitchell Plant. The additional waste from the Mitchell Plant would cause the Mountaineer Landfill Site to deplete its current disposal capacity ahead of schedule.

Also, the cost to transport the fly ash, bottom ash, gypsum, and CPS filter cake to this landfill is not economically feasible in the long term. AEP would pay approximately \$7.27 per ton for transport of fly ash, bottom ash, gypsum, and CPS filter cake from the Mitchell Plant to the Mountaineer Landfill which amounts to approximately \$7,124,600 per year in transportation costs alone based on the estimated 980,000 tons of fly ash, bottom ash, gypsum, and CPS filter cake produced per year at the Mitchell Plant. The cost to transport the waste to the Mountaineer Landfill would be less than transporting the waste to the Cardinal Landfill because it would primarily be transported with barges instead of trucks. Additionally, hauling the waste to the landfill from the Mitchell Plant via truck or barge creates an environmental impact associated with trucking/barge operations, contributes to noise pollution, and increases the potential for traffic accidents. The finite waste capacity, the costs and environmental impact of transport do not make the Mountaineer Landfill Site a viable off-site alternative for the long term.



2.2.3 Off-Site Alternative 3 – South Hills Landfill Site

The South Hills Landfill Site is a municipal solid waste landfill located at 3100 Hill Road in South Park, Pennsylvania, approximately 65 miles northwest of the Mitchell Plant (Figure 5). This off-site alternative is not viable in the long-term because the South Hills Landfill accepts waste from other sources, has daily maximum tonnage limitations, and has a finite waste capacity. As stated previously, approximately 980,000 tons of fly ash, bottom ash, gypsum, and CPS filter cake are produced each year at the Mitchell Plant.

Additionally, at the South Hills Landfill, the gypsum would be landfilled with other municipal solid waste, and could therefore not be reclaimed at a later date if warranted. Also, the cost to transport the fly ash, bottom ash, gypsum, and CPS filter cake to this landfill is not economically feasible in the long term. In addition to an unclarified tipping fee per ton for disposal, AEP would pay approximately \$9.82 per ton for transport of fly ash, bottom ash, gypsum, and CPS filter cake from the Mitchell Plant to the South Hills Landfill which amounts to approximately \$9,623,600 per year in transportation costs alone based on the estimated 980,000 tons of fly ash, bottom ash, gypsum, and CPS filter cake produced per year at the Mitchell Plant. Additionally, hauling the waste to the landfill from the Mitchell Plant via truck or barges creates an environmental impact associated with trucking/barge operations, contributes to noise pollution, and increases the potential for traffic accidents. The minimal amount of waste able to be received by the South Hills Landfill, its finite waste capacity, the costs and environmental impact of transport, and the inability to reclaim landfilled gypsum at a later date do not make this landfill a viable off-site alternative for the long term.

2.2.4 Off-Site Alternative 4 – Conner Run Impoundment

The Conner Run Impoundment is located in Franklin Township, Marshall County, approximately 3,200 feet southeast of the Mitchell Plant. AEP currently utilizes the Conner Run Impoundment to dispose of the fly ash and bottom ash produced at the Mitchell Plant. The Mitchell Plant currently manages fly ash in a wet management system that uses water to form a slurry with the ash which is then transported to the impoundment where the solids settle out.



After settling, the wastewater from the impoundment discharges to a stream called Conner Run through a permitted outlet regulated by WV/NPDES Permit (No. WV0005304). This permit was reissued in November 2010 with new lower effluent limitations at the impoundment discharge that are not achievable with the wet fly ash management system. As such, AEP is investing to convert to a dry fly ash management system thus a landfill has become necessary. AEP will not be able to continue fly ash disposal from Mitchell Plant in the wet impoundment as this would result in non-compliance with the WV/NPDES permit. Therefore, use of the Conner Run Impoundment for future disposal is not a viable option.



3.0 BIOLOGICAL AND PHYSICAL IMPACTS

3.1 EXISTING NATURAL RESOURCES

3.1.1 Overview

The Mitchell Landfill project area is located in Marshall County, West Virginia within the Reading Prong Ecoregion (Griffith et al. 2008)¹. The Reading Prong Ecoregion's rounded summits typically range from 700 to 1,000 feet above mean sea level (AMSL) and are about 200 to 550 feet AMSL above the intervening valleys. Precambrian granitic gneiss, Precambrian hornblende gneiss, and fanglomerate are common. The metamorphic and igneous rocks are covered by slightly acidic, moderately fertile, residual soils which originally supported a native vegetation of Appalachian Oak Forest, dominated by white and red oaks. Today, this Ecoregion consists of residential development, woodland, pastures, and general farmland with forest dominating only the more rugged, stony, or elevated locations (Griffith et al. 2008)².

Topography within the Mitchell Landfill project area generally consists of relatively steep terrain with portions being located along ridgetops and other areas consisting of gently rolling and/or relatively flat areas. Site elevations range from approximately 800 feet to 1,300 feet above mean sea level. Several unnamed ephemeral and intermittent streams are located within the project area and drain toward Fish Creek, Little Tribble Creek, or the Conner Run Impoundment. Little Tribble Creek flows into Fish Creek, with Fish Creek flowing into the Ohio River.

The Mitchell Landfill project area consists of mixed second growth/early successional forest, second growth forest, old field habitat, mixed old field/early successional forest, riparian forest, agricultural row crop fields, palustrine emergent wetland, and hay fields.

¹ Griffith, Glenn E. and James M. Omernik (Lead Authors); Mark McGinley (Topic Editor). 2008. "Ecoregions of Delaware, Maryland, Pennsylvania, Virginia, and West Virginia (EPA)." In: Encyclopedia of Earth. Eds. Cutler J. Cleveland (Washington, D.C.: Environmental Information Coalition, National Council for Science and the Environment). [First published in the Encyclopedia of Earth November 20, 2008; Retrieved December 7, 2011]. Available online: [http://www.eoearth.org/article/Ecoregions_of_Delaware,_Maryland,_Pennsylvania,_Virginia,_and_West_Virginia_\(EPA\)](http://www.eoearth.org/article/Ecoregions_of_Delaware,_Maryland,_Pennsylvania,_Virginia,_and_West_Virginia_(EPA))



Upland plant communities present within the Mitchell Landfill project area consist primarily of the following:

- Agricultural fields were present in the vicinity of the Gatts farmstead and, at the time of the site visits, consisted of either soybean (*Glycine max*) or corn (*Zea mays*).
- Old field vegetation was located primarily within an existing natural gas pipeline right-of-way (ROW), electric transmission powerline ROW, and pastures. Dominant species included the following: Allegheny blackberry (*Rubus allegheniensis*), deertongue (*Dichanthelium clandestinum*), giant ironweed (*Vernonia gigantea*), spotted trumpetweed (*Eupatoriadelphus maculatus*), indianhemp (*Apocynum cannabinum*), hedge false bindweed (*Calystegia sepium*), flattop goldentop (*Euthamia graminifolia*), Queen Anne's lace (*Daucus carota*), common yarrow (*Achillea millefolium*), wildgrape (*Vitis* sp.), white ash (*Fraxinus americana*) saplings, multiflora rose (*Rosa multiflora*), wingstem (*Verbesina alternifolia*), Nepalese browntop (*Microstegium vimineum*), poison ivy (*Toxicodendron radicans*), tall goldenrod (*Solidago altissima*), black raspberry (*Rubus occidentalis*), Canadian horseweed (*Conyza canadensis*), red maple (*Acer rubrum*) saplings, Canadian blacksnakeroot (*Sanicula canadensis*), Christmas fern (*Polystichum acrostichoides*), ticktrefoil (*Desmodium* sp.), orchardgrass (*Dactylis glomerata*), eastern hayscented fern (*Dennstaedtia punctiloba*), and tulip poplar (*Liriodendron tulipifera*) saplings.
- Second growth forest is present within the south/central portion of the project area. These areas are located primarily on the steeper slopes and do not appear to have been logged recently. Dominant canopy species included the following: sugar maple (*Acer saccharum*), red maple, hickory (*Carya* spp.), white ash, American beech (*Fagus grandifolia*), northern red oak (*Quercus rubra*), tulip poplar, American elm (*Ulmus americana*), American basswood (*Tilia americana*), white oak (*Quercus alba*), black cherry (*Prunus serotina*), and hophornbeam (*Ostrya virginiana*). Dominant shrub and herbaceous species included pawpaw (*Asimina triloba*), American hornbeam (*Carpinus caroliniana*), American witchhazel (*Hamamelis virginiana*), hawthorn (*Crataegus* sp.), spicebush (*Lindera benzoin*), multiflora rose, Christmas fern, white snakeroot (*Ageratina altissima*), Canadian woodnettle (*Laportea canadensis*), jumpseed (*Polygonum virginianum*), Nepalese browntop, Virginia creeper (*Parthenocissus quinquefolia*), mayapple (*Podophyllum peltatum*), Canadian clearweed (*Pilea pumila*), jewelweed (*Impatiens capensis*), and common blue wood aster (*Symphotrichum cordifolium*).
- Mixed second growth/early successional forest is present throughout much of the project area, within areas that have been logged or selectively logged relatively recently. Dominant plant species within these habitats were similar to those found within the second growth forest habitats within the project area. However, the understory was significantly more dense with multiflora rose and Allegheny blackberry.
- Riparian forest was located along the base of slopes adjacent to portions of the intermittent streams present within the project area. Dominant canopy species in the

riparian forest included the following: American elm, American sycamore (*Platanus occidentalis*), boxelder, sugar maple, American basswood, and American beech. The understory included species found in the canopy as well as American hornbeam, spicebush, and multiflora rose. Herbaceous species and vines common in these areas consisted of wingstem, Virginia creeper, Canadian woodnettle, jewelweed, pale touch-me-not (*Impatiens pallida*), and smartweed (*Polygonum* sp.).

- Hay field habitats were present near Gatts Ridge Road and in a portion of the Gatts Farmstead. Dominant species in the hay fields included yellow foxtail (*Setaria glauca*), red clover (*Trifolium pratense*), tall fescue (*Schedonorus phoenix*), narrowleaf plantain (*Plantago lanceolata*), common yarrow, white clover (*Trifolium repens*), Queen Anne's lace, giant ironweed, purpletop tridens (*Tridens flavus*), common dandelion (*Taraxacum officinale*), horsenettle (*Solanum carolinense*), barnyardgrass (*Echinochloa crus-galli*), orchardgrass, yellow nutsedge (*Cyperus esculentus*), curly dock (*Rumex crispus*), and common milkweed (*Asclepias syriaca*).

3.1.2 Wetlands

Wetland delineation studies were performed by CEC within the project area. The delineation efforts were completed by CEC as two separate studies. The first delineation study was conducted from August 11 to August 15, 2011 and on September 27 and 28, 2011, for the Proposed Site Plan (Minimum Degradation Alternative) and the Original Site Plan (Maximum Degradation Alternative). The second delineation was conducted on February 14, 15, and 28, 2012, as well as on March 20 and 21, 2012, for the proposed 45-acre Phase II Haul Road limits of disturbance. The wetland delineation studies were conducted in accordance with the procedures outlined in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region* (Interim Regional Supplement, July 2010). As previously stated, Stantec also conducted wetland delineation activities within a Phase II Haul Road study area during August and September of 2011 using the same wetland delineation methodology. Appendix A contains the April 2012 combined Jurisdictional Waters Delineation Reports for the Proposed Mitchell Landfill and the Mitchell Landfill Phase II Haul Road Projects.

Two palustrine emergent wetlands (Wetlands A and B) and one palustrine emergent/scrub-shrub wetland (Wetland K) were identified within the project area (Figure 4). Wetland K and Wetland B are outside of the current planned limits of disturbance. Copies of the wetland determination



data forms are provided in the above referenced reports found in Appendix A. Summary information for each delineated wetland is presented below.

Wetland A is located in the northeastern portion of the project area, outside of the current planned limits of disturbance. CEC classified this 0.01-acre wetland as a palustrine, emergent, seasonally flooded/saturated (PEM1E) wetland (Cowardin 1979). Dominant plant species within this wetland included the following: rice cutgrass (*Leersia oryzoides*), fowl mannagrass (*Glyceria striata*), Frank's sedge (*Carex frankii*), clearweed (*Pilea pumila*), swamp milkweed (*Asclepias incarnata*), and dotted smartweed (*Polygonum punctatum*). No surface water or saturated soils were present within Wetland A during the site visit. Wetland A is located within an existing natural gas pipeline ROW, adjacent to Streams 10 and 10a. Based on the adjacency to these two streams, Wetland A will likely be classified by the USACE as a jurisdictional water of the U.S. A representative photograph of Wetland A is available in Appendix B of the April 2012 Jurisdictional Waters Delineation Report for the Mitchell Landfill Project (Appendix A).

Wetland B is located in the southeastern portion of the project area, southeast of the Gatts Farmstead and within the Proposed Site Plan limits of disturbance (Figure 4). CEC classified this 0.01-acre wetland as a palustrine, emergent, seasonally flooded/saturated (PEM1E) wetland (Cowardin 1979). Dominant species included the following: jewelweed (*Impatiens capensis*), clearweed, Pennsylvania smartweed (*Polygonum pennsylvanicum*), purplestem aster (*Symphotrichum puniceum*), swamp dock (*Rumex verticillatus*), broadleaf cattail (*Typha latifolia*), and field horsetail (*Equisetum arvense*). A spring was observed on the north side of Wetland B and was flowing at the time of the site visit. Stream 16 begins at the downstream terminus of Wetland B and is hydrologically connected to the wetland; therefore, this wetland is likely to be classified by the USACE as a jurisdictional water of the U.S. A representative photograph of Wetland B is available in Appendix B of the April 2012 Jurisdictional Waters Delineation Report for the Mitchell Landfill Project (Appendix A).

Wetland K is located in the vicinity of the southwestern portion of the Phase II Haul Road portion of the project area, outside of the current planned limits of disturbance (Figure 4). Stantec classified this approximately 0.14-acre wetland as a palustrine emergent/scrub-shrub wetland (Cowardin 1979). Dominant plant species included the following: fowl mannagrass and



flat-top goldentop (*Euthamia graminifolia*). Saturated soils were present at the time of survey. A representative photograph of Wetland K is available in Appendix B of the April 2012 Jurisdictional Waters Delineation Report for the Mitchell Landfill Phase II Haul Road Project (Appendix A).

3.1.3 Streams

CEC and Stantec conducted jurisdictional stream delineations and assessments concurrently with the wetland delineations studies that were completed for the project area, which were discussed previously. Using professional judgment and field indicators such as flow, substrate composition, embeddedness, defined bed and bank, vegetation, and benthic macroinvertebrates, stream segments within the project area were classified into one of three stream types: ephemeral, intermittent, and perennial.

Following the methodology outlined in the U.S. Environmental Protection Agency's (USEPA) *Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish, Second Edition* (Barbour et al. 1999), CEC and/or Stantec completed the following forms for each stream that was identified within the project area (see Appendix C in the April 2012 Jurisdictional Waters Delineation Reports for the Mitchell Landfill and the Mitchell Landfill Phase II Haul Road Projects, provided in Appendix A):

- Habitat Assessment Field Data Sheet - High Gradient Streams;
- Physical Characterization/Water Quality Field Data Sheet; and
- Benthic Macroinvertebrate Field Data Sheet.

For the streams that contained sufficient amounts of water, CEC also used a Horiba U-52 Multi-parameter water quality meter to measure temperature, specific conductivity, dissolved oxygen, pH, and turbidity.

CEC and/or Stantec also completed field data sheets for the streams present within the current planned limits of disturbance following the methodology outlined in the USACE's *Operational*



Draft Regional Guidebook for the Functional Assessment of High-gradient Ephemeral and Intermittent Headwater Streams in Western West Virginia and Eastern Kentucky. These forms are provided in Appendix D of the April 2012 Jurisdictional Waters Delineation Reports for the Mitchell Landfill and Mitchell Landfill Phase II Haul Road Projects.

In addition to these forms, CEC documented the average Ordinary High Water Mark (OHWM) width, average bankfull width, average depth of flowing water and/or pools (if present), and dominant substrates for each stream, other than Streams E-1 and E-2, which were identified by Stantec and are currently outside of the planned limits of disturbance.

Thirty streams, totaling approximately 14,992 linear feet, were identified by CEC within the limits of disturbance associated with the Minimum and Maximum Degradation Alternatives, including 18 streams interpreted as ephemeral, two streams interpreted as intermittent, and ten streams interpreted as containing both ephemeral and intermittent reaches. For the Phase II Haul Road portion of the project area, CEC and Stantec identified 30 stream segments, totaling approximately 5,192 linear feet, including 25 streams interpreted as ephemeral and five streams interpreted as intermittent.

A summary of the total number of streams and their respective lengths within the project area, stream classifications, USEPA High Gradient Stream scores, and USACE Functional Capacity Unit scores is presented in Table 3. The location of each stream is shown on Figure 4. Photographs of each stream are available in Appendix B of the April 2012 Jurisdictional Waters Delineation Reports for the Mitchell Landfill and the Mitchell Landfill Phase II Haul Road Projects (Appendix A).



**Table 3.
Characteristics of Delineated Streams**

Stream Segment Identifier	Flow Regime Classification	Approximate Length within Project Area (Feet)	USEPA High Gradient Stream Score	USACE Functional Capacity Units		
				Hydrology	Biogeochemical Cycling	Habitat
Delineated Streams within the Mitchell Landfill Study Area						
Stream 1	Intermittent	3,465	131	97	93	88
			146	95	90	89
			154	98	93	94
	Ephemeral	78	96	93	85	74
Stream 1a	Ephemeral	327	103	98	96	97
Stream 1b	Ephemeral	70	75	94	85	61
Stream 1c	Ephemeral	79	73	67	48	42
Stream 1d	Ephemeral	151	102	93	92	73
Stream 2	Intermittent	372	130	98	94	89
Stream 2a	Ephemeral	70	92	92	88	71
	Intermittent	413	82	93	80	61
Stream 2a-1	Ephemeral	298	82	98	91	74
Stream 2a-2	Ephemeral	51	89	66	63	63
Stream 2a-3	Ephemeral	92	86	74	84	81
Stream 2b	Ephemeral	550	109	94	85	75
Stream 3	Ephemeral	375	103	94	85	84
	Intermittent	216	118	100	94	82
Stream 3a	Ephemeral	178	109	89	85	77
Stream 3b	Ephemeral	119	103	93	81	79
Stream 4	Ephemeral	495	111	91	78	85
Stream 5	Ephemeral	383	110	87	89	78
Stream 6	Ephemeral	51	77	79	89	92
	Intermittent	292	116	92	90	87
Stream 7	Ephemeral	394	107	94	84	72
Stream 8	Intermittent	2,744	82	97	-	-
			138	97	94	96
			153	91	75	79
Stream 8a	Ephemeral	181	101	-	-	-
	Intermittent	95	127	65	58	62
Stream 8b	Ephemeral	201	113	-	-	-
Stream 9	Ephemeral	89	107	-	-	-
	Intermittent	210	125	96	88	86
Stream 10	Ephemeral	199	92	-	-	-
	Intermittent	395	137	96	92	86
Stream 10a	Ephemeral	160	103	-	-	-
Stream 11	Ephemeral	289	124	-	-	-
Stream 12	Ephemeral	439	111	-	-	-
Stream 13	Ephemeral	202	129	-	-	-
	Intermittent	333	125	94	82	79



**Table 3.
Characteristics of Delineated Streams**

Stream Segment Identifier	Flow Regime Classification	Approximate Length within Project Area (Feet)	USEPA High Gradient Stream Score	USACE Functional Capacity Units		
				Hydrology	Biogeochemical Cycling	Habitat
Stream 14	Ephemeral	194	109	-	-	-
	Intermittent	179	140	78	76	62
Stream 15	Ephemeral	290	112	-	-	-
Stream 16	Intermittent	39	91	59	72	55
		152				
Delineated Streams within the Phase II Haul Road Portion of the Project Area						
Stream 17	Ephemeral	97	108	95	98	98
Stream 18	Ephemeral	73	95	71	69	65
Stream 19	Ephemeral	159	96	81	96	87
Stream 20	Ephemeral	178	108	75	88	85
	Intermittent	97	119	74	83	84
Stream 21	Ephemeral	157	105	78	81	74
Stream I-4	Intermittent	234	95	54	82	74
Stream E-14	Ephemeral	91	65	57	48	63
Stream E-14a	Ephemeral	169	90	66	82	59
Stream 22	Intermittent	511	110	60	82	64
Stream E-9	Ephemeral	421	105	63	80	64
Stream 24	Intermittent	424	124	63	77	73
Stream E-7	Ephemeral	313	112	60	78	83
Stream 25a	Ephemeral	94	88	48	60	68
Stream 26	Ephemeral	95	75	48	75	74
Stream 27	Ephemeral	37	95	71	81	86
Stream E-3 ^B	Ephemeral	810	104	65	66	57
Stream I-2	Intermittent	72	93	71	63	75
Stream E-4	Ephemeral	90	95	67	54	61
Stream E-5	Ephemeral	109	97	65	76	50
Stream E-5a	Ephemeral	59	82	61	45	63
Stream E-5b	Ephemeral	53	88	55	55	68
Stream E-1 ^A	Ephemeral	60	108	-	-	-
Stream E-2 ^A	Ephemeral	216	81	-	-	-
Stream E-6	Ephemeral	320	85	60	66	45
Stream E-8	Ephemeral	58	76	62	72	54
Stream E-10	Ephemeral	134	111	70	64	63
Stream E-11	Ephemeral	99	87	91	80	81
Stream E-12	Ephemeral	101	92	62	70	65
Stream E-13	Ephemeral	62	85	74	82	84
Total		20,385				

^A This stream was identified by Stantec, but was not been field verified by CEC, as it is located outside of the current planned limits of disturbance.

^B The stream length includes a portion of the stream located outside the planned limits of disturbance.



CEC made preliminary jurisdictional determinations following the USACE Jurisdictional Determination Form Instructional Guidebook. CEC completed Waters Upload Spreadsheets for the Mitchell Landfill and Mitchell Landfill Phase II Haul Road portions of the project area and submitted them electronically to the USACE to assist the USACE with their jurisdictional determinations of the waters in the project area. A copy of the USACE Preliminary Jurisdictional Determination letter, dated November 15, 2011, for the Mitchell Landfill portion of the project area is included in Appendix A.

Based upon correspondence from the USACE dated July 14, 2008 (Appendix E of the Jurisdictional Waters Delineation Report for the Mitchell Landfill Phase II Haul Road Project), and preliminary discussions with the USACE during the March 21, 2012, JD site visit conducted within the Phase II Haul Road portion of the project area, AEP and CEC anticipate that the waters within the Phase II Haul Road portion of the project area will not be considered jurisdictional waters of the U.S. as there is no significant nexus to traditional navigable waters due to the presence of the Conner Run Impoundment.

Fish Creek, Little Tribble Creek, and Conner Run are not listed within the *West Virginia Water Quality Standards* (Title 47CRS2, West Virginia 2008). Therefore, streams within the project area do not have protected aquatic life use designations such as Warm Water Fishery (WWF; *West Virginia Water Quality Standards*, Title 47CRS2, West Virginia 2008). The streams within the project area are located within the Lower Fish Creek watershed (12-digit hydrologic unit code 050301061208).

A pre-application meeting was held at the Mitchell Landfill portion of the project area on September 14, 2011, with representatives of CEC, AEP, West Virginia Department of Environmental Protection (WVDEP), and the USACE. As stated, a preliminary JD response letter for the Mitchell Landfill portion of the project area was received from the USACE on November 15, 2011, and is included in Appendix B. A JD site visit and field review was conducted within the Phase II Haul Road portion of the project area on March 21, 2012, and the attendees included representatives from AEP, the USACE, and CEC. As stated, the USACE is



currently in the process of preparing a formal JD letter for waters identified within the Phase II Haul Road portion of the project area.

3.1.4 Threatened and Endangered Species

The USFWS currently lists the Indiana bat (*Myotis sodalis* – federally-listed endangered) as the only federally-listed threatened and endangered species known to occur, or potentially occurring, within Marshall County, West Virginia. Subsequent to receipt of concurrence from the USFWS on an Indiana bat study plan specific to this project, CEC conducted a species-specific survey for the Indiana bat between July 13 and July 17, 2011, within the Mitchell Landfill portion of the project area. No Indiana bats were captured during the mist net survey that was conducted. A report summarizing the findings of the survey was submitted to the USFWS on August 1, 2011. The survey findings are summarized below:

Table 4. Indiana Bat Habitat and Mist Net Survey Results				
Federally-Listed Species	USFWS-Approved Surveyor	On-site Habitat Evaluation Findings	Presence/Absence Survey Dates	On-site Presence-Absence Survey Findings
Indiana bat ¹	Mary Gilmore (CEC)	Potentially suitable habitat present on-site	July 2011	No Indiana bats captured

¹ See report in Appendix C for detailed explanation.

As shown in the table and outlined in the Indiana bat survey report provided in Appendix C, no Indiana bats were captured during the mist net surveys conducted in July 2011 by CEC. The USFWS responded in a letter dated August 19, 2011, stating that because no Indiana bats were captured, no impact is expected for this species. A copy of this letter is included in Appendix B – Agency Correspondence.

CEC submitted a coordination letter to the West Virginia Department of Natural Resources (WVDNR) on July 6, 2011, regarding records of state- and/or federally-listed threatened and



endangered species occurring within the boundaries of and/or vicinity (a 1 mile radius) of the Mitchell Landfill portion of the project area. WVDNR responded on July 20, 2011, and stated that there are no known records of rare, threatened, or endangered species within the project area (Appendix B).

CEC submitted a coordination letter to the WVDNR on February 20, 2012, regarding records of state- and/or federally-listed threatened and endangered species occurring within the boundaries of and/or vicinity (a 1 mile radius) of the Phase II Haul Road portion of the project area. WVDNR responded on February 29, 2012, and that there are no known records of rare, threatened, or endangered species within the project area (Appendix B).

On January 25, 2012, CEC consulted the USFWS regarding the Indiana bat and the Phase II Haul Road portion of the project area. Because the proposed limits of disturbance associated with the Phase II Haul Road extended more than 500 feet away from the nearest mist net survey location and more than 17 acres of forest would be cleared for construction of the Phase II Haul Road, the USFWS requested that a pedestrian cave/mine portal survey and desktop Indiana bat habitat assessment study be conducted for the Phase II Haul Road limits of disturbance and its vicinity. CEC completed these activities, prepared an Indiana bat habitat assessment and cave/mine portal survey report (Appendix C), and submitted it to the USFWS on February 20, 2012. CEC received a letter from the USFWS on February 29, 2012 (Appendix B), stating that construction of the Phase II Haul Road may affect, but is not likely to adversely affect the Indiana bat, provided that tree clearing activities are conducted in that area between November 15 and March 31. The USFWS also stated that construction of the Phase II Haul Road will have no effect on other federally-listed or candidate species.

3.1.5 Cultural Resources

A Phase I Cultural Resource Investigation (Phase I) was completed by Gray & Pape, Inc. (Gray & Pape) between July 26 and August 3, 2011, within the limits of disturbance associated with the Mitchell Landfill Proposed Site Plan (Appendix D). The Phase I study covered approximately 151 acres of uplands, valley bottoms, and side slopes within the landfill footprint and its



immediate vicinity. Investigations revealed five newly-identified archaeological sites consisting of several small historic artifact scatters, a set of bridge abutments, and two isolated finds. None of these archaeological resources were recommended as eligible for inclusion to the National Register of Historic Places (NRHP).

The survey also identified two architectural resources and a historic cemetery within the project area. The archaeological component of a mid-nineteenth through twentieth century historic farmstead with extant buildings, features, and a large historic artifact scatter was identified as potentially eligible for inclusion to the NRHP. Gray & Pape recommended Phase II testing if the proposed project will impact these sites. The Cooper/Gatts Farmhouse and associated granary was identified as potentially eligible for inclusion to the NRHP. A draft Memorandum of Agreement is currently under review by the USACE and the West Virginia Division of Culture and History (WVDCH). The remaining architectural resources and historic cemetery were not considered eligible for inclusion in the NRHP and no further assessment was recommended for those sites.

The Phase I report was submitted to the WVDCH, which houses the West Virginia State Historic Preservation Office (WVSHPO), on October 17, 2011. In a letter from the WVDCH to Gray & Pape dated November 28, 2011 (Appendix B), the WVDCH concurred with the recommendations of the Phase I report, that additional archaeological investigations were necessary at the historic farmstead archaeological site identified within the project area to determine NRHP eligibility.

Gray & Pape completed the Phase II Cultural Resource Investigation between November 7 and November 18, 2011. The Phase II investigation was completed at the historic farmstead archaeological site. In the Phase II report (Appendix D), Gray & Pape concluded that the archaeological component of the investigated site was not eligible for inclusion in the NRHP and recommended no further testing. The Phase II report was submitted to the WVDCH on January 20, 2012. In a letter dated March 5, 2012, from the WVDCH to Gray & Pape (Appendix B), the WVDCH concurred with the recommendations of the Phase II report that the investigated site is



not eligible for inclusion in the NRHP and no further archaeological investigations are necessary at the historic farmstead archaeological site.

A Phase I was completed by Weller & Associates (Weller) for a Phase II Haul Road study area on September 6, 2011 (Appendix D). The investigation did not identify archaeological or architectural sites. Weller reported that the project is not considered to affect properties eligible for inclusion on the NRHP. No further cultural resource assessment was recommended by Weller. This report was submitted to the WVDCH on April 4, 2012, for concurrence with its findings and recommendations. To date, a response has not been received from the WVDCH.

A supplemental Phase I was completed by Gray & Pape between February 20 and 24, 2012, for additional areas of planned disturbance associated with construction of the Phase II Haul Road (Appendix D). The archaeological investigation identified several historical deposits likely associated with the former Peter Gatts House (Site 46Mr161). The Phase I survey also identified one previously undocumented architectural resource (a circa 1904 gabled-L house at 147 Gatts Ridge Road). Neither of these two sites was recommended as being eligible for inclusion to the NRHP. No additional cultural resource investigations were recommended by Gray & Pape. This report was submitted to the WVDCH on April 4, 2012, for concurrence with its findings and recommendations. To date, a response has not been received from the WVDCH.

3.2 NATURAL RESOURCE IMPACTS

3.2.1 Alternative 1 – Minimum Degradation Alternative/Proposed Site Plan

Impacts to Wetlands

Under Alternative 1, one wetland (Wetland B) will be impacted as a result of the construction and operation of the Mitchell Landfill project. Wetland B is a 0.01-acre palustrine emergent wetland (PEM) that will be filled by a soil stockpile located southeast of the proposed landfill. The two remaining wetlands, Wetlands A and K, will not be impacted, as these aquatic resources are located outside the current limits of disturbance for this alternative.



Impacts to Open Waters

One open water area, totaling approximately 1.0 acre, will be impacted as a result of the construction and operation of the landfill. Open Water 1, a pond located adjacent to Stream 16 and southeast of Wetland B, will be filled by a soil stockpile located southeast of the proposed landfill. No other open water areas will be impacted by this alternative.

Impacts to Streams

Under the Minimum Degradation Alternative/Proposed Site Plan, approximately 13,626 linear feet of stream would be filled or otherwise impacted by construction and operation activities, including 8,527 linear feet of ephemeral stream and 5,099 linear feet of intermittent stream. Approximately 3,578 linear feet of the total ephemeral stream impacts and 1,338 linear feet of the total intermittent stream impacts are associated with the proposed Phase II Haul Road portion of the project area and the Conner Run Impoundment and therefore are assumed to not represent impacts to jurisdictional waters of the U.S. The following table summarizes the proposed stream impacts under the Minimum Degradation Alternative.

Table 5. Minimum Degradation Alternative Stream Impacts		
Stream Segment Identifier	Flow Regime Classification	Approximate Length of Stream Impact (Ft)
Impacts to Streams within the Minimum Degradation Alternative Limits of Disturbance		
Stream 1	Intermittent	3,465
	Ephemeral	78
Stream 1a	Ephemeral	327
Stream 1b	Ephemeral	70
Stream 1c	Ephemeral	79
Stream 1d	Ephemeral	151
Stream 2	Intermittent	372
Stream 2a	Ephemeral	70
	Intermittent	413
Stream 2a-1	Ephemeral	298
Stream 2a-2	Ephemeral	51



**Table 5.
Minimum Degradation Alternative Stream Impacts**

Stream Segment Identifier	Flow Regime Classification	Approximate Length of Stream Impact (Ft)
Stream 2a-3	Ephemeral	92
Stream 2b	Ephemeral	550
Stream 3	Ephemeral	375
	Intermittent	216
Stream 3a	Ephemeral	178
Stream 3b	Ephemeral	119
Stream 4	Ephemeral	495
Stream 5	Ephemeral	383
Stream 6	Ephemeral	51
	Intermittent	292
Stream 7	Ephemeral	394
Stream 16	Intermittent	191
Total Intermittent Impacts		3,761
Total Ephemeral Impacts		4,949
TOTAL		8,710
Impacts to Streams within the Phase II Haul Road Limits of Disturbance¹		
Stream 17	Ephemeral	97
Stream 18	Ephemeral	73
Stream 19	Ephemeral	159
Stream 20	Ephemeral	178
Stream 21	Ephemeral	157
Stream E-14	Ephemeral	91
Stream E-14a	Ephemeral	169
Stream E-9	Ephemeral	421
Stream E-7	Ephemeral	313
Stream 25a	Ephemeral	94
Stream 26	Ephemeral	95
Stream 27	Ephemeral	37
Stream E-3	Ephemeral	609
Stream E-4	Ephemeral	90
Stream E-5	Ephemeral	109
Stream E-5a	Ephemeral	59
Stream E-5b	Ephemeral	53
Stream E-6	Ephemeral	320
Stream E-8	Ephemeral	58
Stream E-10	Ephemeral	134
Stream E-11	Ephemeral	99
Stream E-12	Ephemeral	101
Stream E-13	Ephemeral	62

**Table 5.
Minimum Degradation Alternative Stream Impacts**

Stream Segment Identifier	Flow Regime Classification	Approximate Length of Stream Impact (Ft)
Stream 20	Intermittent	97
Stream I-4	Intermittent	234
Stream 22	Intermittent	511
Stream 24	Intermittent	424
Stream I-2	Intermittent	72
Total Intermittent Impacts		1,338¹
Total Ephemeral Impacts		3,578¹
TOTAL		4,916¹
TOTAL PROPOSED STREAM IMPACTS FOR MINIMUM DEGRADATION ALTERNATIVE		13,626²

¹ These stream impacts are not considered impacts to jurisdictional waters of the U.S.

² These stream impacts include impacts to streams that are not considered jurisdictional waters of the U.S.

Impacts to Surface Water Flow Patterns

Under the Minimum Degradation Alternative/Proposed Site Plan, the streams that were identified in Table 5 will be filled or otherwise disturbed and the majority of surrounding areas will be re-contoured, thereby eliminating natural flow patterns. This alternative will impact two separate subwatersheds to Lower Fish Creek, including unnamed tributaries to Conner Run and Fish Creek.

Under this alternative, stormwater runoff will be retained within the on-site sedimentation ponds. Non-contact stormwater will be collected from the landfill and Phase II Haul Road portions of the project area and routed into the tributaries of Fish Creek and the Conner Run Impoundment, thereby maintaining base flows within downstream portions of these surface waters.

Impacts to Water Quality

Many of the ephemeral and intermittent streams that were identified by CEC in the project area were found to have marginal water quality. Within the limits of disturbance associated with the Minimum Degradation Alternative/Proposed Site Plan, approximately 8,519 linear feet of stream



drains to Fish Creek, including 3,761 linear feet of ephemeral stream and 4,758 linear feet of intermittent stream. Within the limits of disturbance associated with the Phase II Haul Road portion of the project area, a total of 4,916 linear feet of stream contribute to the hydrology of Conner Run Impoundment drainage, including 1,338 linear feet of intermittent stream and 3,578 linear feet of ephemeral stream. Under this alternative, these tributaries will be filled or otherwise disturbed, thus eliminating the benefits that these surface waters provide to the greater water quality within the project area. Impacts to off-site water quality will be reduced by the implementation of a proper Stormwater Management Plan (as required by the Solid Waste regulations), which will stipulate the use of Best Management Practices (BMPs) throughout the development and operation of the Mitchell Landfill project. AEP proposes to off-set the loss of the streams that are considered jurisdictional waters of the U.S. (8,710 linear feet of stream) through the restoration and/or enhancement of approximately 20,000 to 25,000 linear feet (approximately 8,862 SWVM credits) of existing streams in Marshall County, West Virginia. A conceptual stream mitigation plan is provided in Appendix E.

Impacts to Aquatic Communities

Forty-five streams, totaling approximately 13,626 linear feet, are proposed to be impacted by the Minimum Degradation Alternative. Based on CEC's stream delineation and assessment activities conducted within the project area and professional judgment, a limited number of streams within the project area provide habitat for aquatic macroinvertebrates and stream salamanders. No fish were observed within the water bodies identified within the project area. Small assemblages of benthic macroinvertebrates were identified in the intermittent portions of Stream 1, Stream 2, Stream 2a, Stream 3, Stream 6, Stream 22, Stream 24, Stream I-2, and Stream I-4. Northern dusky salamanders (*Desmognathus fuscus*) and green frogs (*Rana clamitans*) were observed in some of the intermittent streams within the Minimum Degradation Alternative/Proposed Site Plan limits of disturbance. The aquatic macroinvertebrate and aquatic amphibian communities inhabiting these streams would be lost or displaced (downstream) as a result of the implementation of the Minimum Degradation Alternative/Proposed Site Plan. Aquatic communities in tributaries of Little Tribble Creek would not be impacted under the Minimum Degradation Alternative/Proposed Site Plan.



Impacts to Terrestrial Flora

Under the Minimum Degradation Alternative/Proposed Site Plan, a maximum of approximately 207 acres may be cleared and re-contoured to meet the needs of the landfill and associated facilities, including the Phase II Haul Road. It is noted that not all areas within the Minimum Degradation Alternative/Proposed Site Plan boundary will be impacted. Disturbance will be limited to the areas directly impacted by the landfill footprint, stormwater ponds, laydown areas, soil borrow areas, soil stockpile areas, general access roads, and the Phase II Haul Road.

Approximately 164 acres of the 207-acre study area are comprised of upland and riparian forest habitat that contains a mixture of species commonly found in second growth and early successional forest. The remaining acreage consists primarily of old field vegetation associated with existing natural gas and overhead electric transmission line ROWs, agricultural fields, and hay fields. Some of the forested habitat within the limits of disturbance associated with the Minimum Degradation Alternative/Proposed Site Plan contains invasive non-native plant species including multiflora rose. The impact of the Minimum Degradation Alternative on regional floral diversity would be moderate as the limits of disturbance associated with this alternative contain common plant species that are likely abundant within the adjacent areas of second growth forest and other vegetation communities that will be avoided under this alternative.



Impacts to Terrestrial Fauna

The majority of the project area's indigenous terrestrial fauna would be temporarily displaced as a result of the implementation of the Minimum Degradation Alternative/Proposed Site Plan. Wildlife such as the eastern gray squirrel (*Sciurus carolinensis*), eastern chipmunk (*Tamias striatus*), wild turkey (*Meleagris gallopavo*), raccoon (*Procyon lotor*), various songbirds, and white-tailed deer (*Odocoileus virginianus*), would likely be displaced to nearby forested areas and other vegetation communities. The impact of the Minimum Degradation Alternative on terrestrial fauna would be moderate as the majority of these animals would disperse to adjacent areas during the construction and operation of the landfill.

Impacts to Threatened and Endangered Species

As stated previously, according to the USFWS, the only federally-listed threatened or endangered species known to occur, or potentially occurring, in Marshall County, West Virginia is the federally-listed endangered Indiana bat. However, as outlined in the Indiana bat survey report provided in Appendix C, no Indiana bats were captured during the mist net surveys conducted in July 2011 by CEC. The USFWS responded in a letter dated August 19, 2011, stating that because no Indiana bats were captured, no impact is expected for this species. A copy of this letter is included in Appendix B.

CEC submitted a coordination letter to the WVDNR on July 6, 2011, regarding records of state- and/or federally-listed threatened and endangered species occurring within the boundaries of and/or vicinity (a 1 mile radius) of the Mitchell Landfill portion of the project area. WVDNR responded on July 20, 2011, and stated that there are no known records of rare, threatened, or endangered species within the project area (Appendix B).

CEC submitted a coordination letter to the WVDNR on February 20, 2012, regarding records of state- and/or federally-listed threatened and endangered species occurring within the boundaries of and/or vicinity (a 1 mile radius) of the Phase II Haul Road portion of the project area.



WVDNR responded on February 29, 2012, and that there are no known records of rare, threatened, or endangered species within the project area (Appendix B).

On January 25, 2012, CEC consulted the USFWS regarding the Indiana bat and the Phase II Haul Road portion of the project area. Because the proposed limits of disturbance associated with the Phase II Haul Road extended more than 500 feet away from the nearest mist net survey location and more than 17 acres of forest would be cleared for construction of the Phase II Haul Road, the USFWS requested that a pedestrian cave/mine portal survey and desktop Indiana bat habitat assessment study be conducted for the Phase II Haul Road limits of disturbance and its vicinity. CEC completed these activities, prepared an Indiana bat habitat assessment and cave/mine portal survey report (Appendix C), and submitted it to the USFWS on February 20, 2012. CEC received a letter from the USFWS on February 29, 2012 (Appendix B), stating that construction of the Phase II Haul Road may affect, but is not likely to adversely affect the Indiana bat, provided that tree clearing activities are conducted in that area between November 15 and March 31. The USFWS also stated that construction of the Phase II Haul Road will have no effect on other federally-listed or candidate species.

Therefore, there are no anticipated impacts to threatened and/or endangered species under the Minimum Degradation Alternative/Proposed Site Plan.

3.2.2 Alternative 2 – Maximum Degradation Alternative/Original Site Plan

Impacts to Wetlands

Two wetlands, totaling 0.02 acre, would be impacted as a result of the construction and operation of Alternative 2. Wetland B is a 0.01 acre PEM wetland that would be filled by a soil stockpile that is planned to be located southeast of the proposed landfill. Additionally, Wetland A is a 0.01 acre PEM wetland that would be filled as part of the proposed landfill footprint that extends into a subwatershed of Little Tribble Creek. Wetland K would not be impacted as it is located outside the limits of disturbance.



Impacts to Open Waters

One open water area, totaling approximately 1.0 acre, would be impacted as a result of the construction and operation of this Alternative. Open Water 1, a pond located adjacent to Stream 16 and southeast of Wetland B, would be filled by a planned soil stockpile. No other open water areas would be impacted by this alternative.

Impacts to Streams

Under the Maximum Degradation Alternative/Original Site Plan, approximately 19,908 linear feet of stream would be filled, including 9,665 linear feet of ephemeral stream and 10,243 linear feet of intermittent stream. Approximately 3,578 linear feet of the total ephemeral stream impacts and 1,338 of the total intermittent stream impacts are associated with the proposed Phase II Haul Road and Conner Run Impoundment portion of the project area and therefore are assumed to not represent impacts to jurisdictional waters of the U.S. The following table summarizes the proposed stream impacts under the Maximum Degradation Alternative.

Table 6. Maximum Degradation Alternative Stream Impacts		
Stream Segment Identifier	Flow Regime Classification	Approximate Length in Study Area (Ft)
Impacts to Streams within the Maximum Degradation Alternative Limits of Disturbance		
Stream 1	Intermittent	3,465
	Ephemeral	78
Stream 1a	Ephemeral	327
Stream 1b	Ephemeral	70
Stream 1c	Ephemeral	79
Stream 1d	Ephemeral	151
Stream 2	Intermittent	372
Stream 2a	Ephemeral	70
	Intermittent	413
Stream 2a-1	Ephemeral	298
Stream 2a-2	Ephemeral	51
Stream 2a-3	Ephemeral	92
Stream 2b	Ephemeral	550
Stream 3	Ephemeral	375
	Intermittent	216
Stream 3a	Ephemeral	178



**Table 6.
Maximum Degradation Alternative Stream Impacts**

Stream Segment Identifier	Flow Regime Classification	Approximate Length in Study Area (Ft)
Stream 3b	Ephemeral	119
Stream 4	Ephemeral	495
Stream 5	Ephemeral	383
Stream 6	Ephemeral	51
	Intermittent	292
Stream 7	Ephemeral	394
Stream 8	Ephemeral	82
	Intermittent	2,744
Stream 8a	Ephemeral	181
	Intermittent	95
Stream 8b	Ephemeral	201
Stream 9	Ephemeral	89
	Intermittent	210
Stream 10	Ephemeral	199
	Intermittent	395
Stream 10a	Ephemeral	160
Stream 11	Ephemeral	289
Stream 12	Ephemeral	439
Stream 13	Ephemeral	202
	Intermittent	333
Stream 14	Ephemeral	194
	Intermittent	179
Stream 15	Ephemeral	290
Stream 16	Intermittent	191
Total Intermittent Impacts		8,905
Total Ephemeral Impacts		6,087
TOTAL		14,992
Impacts to Streams within the Phase II Haul Road Limits of Disturbance¹		
Stream 17	Ephemeral	97
Stream 18	Ephemeral	73
Stream 19	Ephemeral	159
Stream 20	Ephemeral	178
Stream 21	Ephemeral	157
Stream E-14	Ephemeral	91
Stream E-14a	Ephemeral	169
Stream E-9	Ephemeral	421
Stream E-7	Ephemeral	313
Stream 25a	Ephemeral	94
Stream 26	Ephemeral	95
Stream 27	Ephemeral	37
Stream E-3	Ephemeral	609
Stream E-4	Ephemeral	90
Stream E-5	Ephemeral	109



**Table 6.
Maximum Degradation Alternative Stream Impacts**

Stream Segment Identifier	Flow Regime Classification	Approximate Length in Study Area (Ft)
Stream E-5a	Ephemeral	59
Stream E-5b	Ephemeral	53
Stream E-6	Ephemeral	320
Stream E-8	Ephemeral	58
Stream E-10	Ephemeral	134
Stream E-11	Ephemeral	99
Stream E-12	Ephemeral	101
Stream E-13	Ephemeral	62
Stream 20	Intermittent	97
Stream I-4	Intermittent	234
Stream 22	Intermittent	511
Stream 24	Intermittent	424
Stream I-2	Intermittent	72
Total Intermittent Impacts		1,338¹
Total Ephemeral Impacts		3,578¹
TOTAL		4,916¹
TOTAL PROPOSED STREAM IMPACTS FOR ALTERNATIVE 2		19,908²

¹ These stream impacts are not considered impacts to jurisdictional waters of the U.S.

² These stream impacts include impacts to streams that are not considered jurisdictional waters of the U.S.

Impacts to Surface Water Flow Patterns

Under the Maximum Degradation Alternative, surface water flow patterns would be significantly impacted, as illustrated by Table 6. The primary difference between the Maximum Degradation Alternative and the Minimum Degradation Alternative is the size of the proposed landfill and associated limits of disturbance. The limits of waste for this alternative would be approximately 98 acres, compared to 58 acres under Alternative 1. The limits of disturbance for the Maximum Degradation Alternative, including the Phase II Haul Road limits of disturbance, is approximately 301 acres. The Maximum Degradation Alternative would impact three separate subwatersheds to Lower Fish Creek, including unnamed tributaries to Fish Creek, Little Tribble Creek, and the Conner Run Impoundment. The impacted streams will be filled or otherwise disturbed and the majority of surrounding areas will be re-contoured, thereby eliminating natural flow patterns. In addition, surface water flow upgradient of the limits of disturbance will be



affected as it will be directed around the landfill or collected in the constructed stormwater ponds.

Under this alternative, stormwater runoff will be managed within the on-site sedimentation ponds. Non-contact stormwater will be collected from the landfill and Phase II Haul Road portions of the project area and routed into the tributaries of Fish Creek, Little Tribble Creek, and the Conner Run Impoundment, thereby maintaining base flows within downstream portions of these surface waters.

Impacts to Water Quality

Many of the ephemeral and intermittent streams that were identified by CEC in the project area were found to have marginal water quality. Approximately 8,519 linear feet of stream drains to Fish Creek, including 3,761 linear feet of ephemeral stream and 4,758 linear feet of intermittent stream. Approximately 6,473 linear feet of stream drains to Little Tribble Creek, including 2,326 linear feet of ephemeral stream and 4,147 linear feet of intermittent stream. Within the limits of disturbance associated with the Phase II Haul Road portion of the project area, a total of 4,916 linear feet of stream contribute to the hydrology of Conner Run Impoundment drainage, including 1,338 linear feet of intermittent stream and 3,578 linear feet of ephemeral stream. Under this alternative, these tributaries will be filled or otherwise disturbed, thus eliminating the benefits that these surface waters provide to the greater water quality within the study area. Impacts to off-site water quality will be reduced by the implementation of a proper Stormwater Management Plan (as required by the Solid Waste regulations), which will stipulate the use of BMPs throughout the development and operation of the Mitchell Landfill project. AEP would off-set the loss of the streams that are considered jurisdictional waters of the U.S. (14,992 linear feet of stream) through the restoration and/or enhancement of approximately 20,000 to 25,000 linear feet (whatever is required to acquire the applicable amount of SWVM credits) of existing streams in Marshall County, West Virginia.



Impacts to Aquatic Communities

Fifty-six streams, totaling approximately 19,908 linear feet are proposed to be impacted by the Maximum Degradation Alternative. Based on CEC's stream delineation and assessment activities conducted within the project area and professional judgment, a limited number of streams within the project area provide habitat for aquatic macroinvertebrates and stream salamanders. No fish were observed within the water bodies identified within the project area. Small assemblages of benthic macroinvertebrates were identified in the intermittent portions of Stream 1, Stream 2, Stream 2a, Stream 3, and Stream 6, Stream 8, Stream 9, Stream 10, Stream 12, Stream 14, Stream 22, Stream 24, I-2, and I-4. Northern dusky salamanders and green frogs were observed in some of the intermittent streams within the Maximum Degradation Alternative/Original Site Plan limits of disturbance. The aquatic macroinvertebrate and aquatic amphibian communities inhabiting these streams would be lost or displaced (downstream) as a result of the implementation of the Maximum Degradation Alternative/Original Site Plan.

Impacts to Terrestrial Flora

Under the Maximum Degradation Alternative, a maximum of approximately 301 acres may be cleared and re-contoured to meet the needs of the landfill and associated facilities, including the Phase II Haul Road. It is noted that not all areas within the Maximum Degradation Alternative/Proposed Site Plan boundary will be impacted. Disturbance will be limited to the areas directly impacted by the landfill footprint, stormwater ponds, laydown areas, soil borrow areas, soil stockpile areas, general access roads, and the Phase II Haul Road.

Approximately 253 acres of the 301-acre study area is comprised of upland and riparian forest habitat that contains a mixture of species commonly found in second growth and early successional forest. The remaining acreage consists primarily of old field vegetation associated with existing natural gas and overhead electric transmission line ROWs, agricultural fields, and hay fields. Some of the forested habitat within the limits of disturbance associated with the Maximum Degradation Alternative/Original Site Plan contains invasive non-native plant species including multiflora rose. The impact of the Maximum Degradation Alternative on regional



floral diversity would be moderate as the limits of disturbance associated with this alternative contains common plant species that are likely abundant within adjacent areas of second growth forest that will not be impacted under this alternative.

Impacts to Terrestrial Fauna

The majority of the Site's indigenous terrestrial fauna would be temporarily displaced a result of the implementation of the Maximum Degradation Alternative. Wildlife such as the eastern gray squirrel, eastern chipmunk, wild turkey, raccoon, various songbirds, and white-tailed deer, would likely be displaced to nearby forested areas and other vegetation communities. The impact of the Maximum Degradation Alternative on terrestrial fauna would be moderate as the majority of these animals would disperse to adjacent areas during the construction and operation of the landfill.

Impacts to Threatened and Endangered Species

As stated previously, according the USFWS, the only federally-listed threatened or endangered species known to occur, or potentially occurring, in Marshall County, West Virginia is the federally-listed endangered Indiana bat. However, as outlined in the Indiana bat survey report provided in Appendix C, no Indiana bats were captured during the mist net surveys conducted in July 2011 by CEC. The USFWS responded in a letter dated August 19, 2011, stating that because no Indiana bats were captured, no impact is expected for this species. A copy of this letter is included in Appendix B – Agency Correspondence.

CEC submitted a coordination letter to the WVDNR on July 6, 2011, regarding records of state- and/or federally-listed threatened and endangered species occurring within the boundaries of and/or vicinity (a 1 mile radius) of the Mitchell Landfill portion of the project area. WVDNR responded on July 20, 2011, and stated that there are no known records of rare, threatened, or endangered species within the project area (Appendix B).



CEC submitted a coordination letter to the WVDNR on February 20, 2012, regarding records of state- and/or federally-listed threatened and endangered species occurring within the boundaries of and/or vicinity (a 1 mile radius) of the Phase II Haul Road portion of the project area. WVDNR responded on February 29, 2012, and that there are no known records of rare, threatened, or endangered species within the project area (Appendix B).

On January 25, 2012, CEC consulted the USFWS regarding the Indiana bat and the Phase II Haul Road portion of the project area. Because the proposed limits of disturbance associated with the Phase II Haul Road extended more than 500 feet away from the nearest mist net survey location and more than 17 acres of forest would be cleared for construction of the Phase II Haul Road, the USFWS requested that a pedestrian cave/mine portal survey and desktop Indiana bat habitat assessment study be conducted for the Phase II Haul Road limits of disturbance and its vicinity. CEC completed these activities, prepared an Indiana bat habitat assessment and cave/mine portal survey report (Appendix C), and submitted it to the USFWS on February 20, 2012. CEC received a letter from the USFWS on February 29, 2012 (Appendix B), stating that construction of the Phase II Haul Road may affect, but is not likely to adversely affect the Indiana bat, provided that tree clearing activities are conducted in that area between November 15 and March 31. The USFWS also stated that construction of the Phase II Haul Road will have no effect on other federally-listed or candidate species.

Therefore, there are no anticipated impacts to threatened and/or endangered species under the Maximum Degradation Alternative/Original Site Plan.

3.2.3 Comparison of On-Site Alternatives

The following table compares the environmental impacts of the Minimum and Maximum Degradation Alternatives.



**Table 7.
Environmental Impact Comparison of the On-Site Alternatives**

IMPACT	Alternative 1 - Minimum Degradation Alternative	Alternative 2 - Maximum Degradation Alternative
Proposed Jurisdictional Wetland Impacts (acres)	0.01	0.02
Proposed Open Water Impacts (acres)	1.0	1.0
Proposed Jurisdictional Stream Impacts (linear feet)	8,710 ft. total - 3,761 ft. intermittent - 4,949 ft. ephemeral	14,992 ft. total - 8,905 ft. intermittent - 6,087 ft. ephemeral
Impacts to Surface Water Flow Patterns	Moderate (First, Second, and Third Order Streams Filled or Otherwise Impacted)	Moderate (First, Second, and Third Order Streams Filled or Otherwise Impacted)
Impacts to Water Quality	Moderate	Moderate
Impacts to Aquatic Communities	Moderate (Portions of Stream 1, Stream 2, Stream 2a, Stream 3, Stream 6, Stream 22, Stream 24, Stream I-2, and Stream I-4 filled/impacted)	Severe (The majority of Stream 1, Stream 2, Stream 2a, Stream 3, Stream 6, Stream 8, Stream 9, Stream 10, Stream 12, Stream 14, Stream 22, Stream 24, Stream I-2, and Stream I-4 filled/impacted)
Impacts to Terrestrial Flora	Moderate (Approximately 207 acres of forest and other vegetation communities eliminated)	Moderate (Approximately 301 acres of forest and other vegetation communities eliminated)
Impacts to Terrestrial Fauna	Moderate (Approximately 207 acres of terrestrial habitats impacted)	Moderate (Approximately 301 acres of terrestrial habitats impacted)
Impacts to Threatened and Endangered Species	None (Identified to date)	None (Identified to date)

The differences in the environmental impacts are primarily attributed to the differing size of the two landfill alternatives. Under the Minimum Degradation Alternative, the landfill footprint will be approximately 58 acres, with a maximum disturbance footprint of approximately 207 acres, compared to a landfill footprint of 98 acres and a maximum disturbance footprint of



approximately 301 acres under the Maximum Degradation Alternative. The Maximum Degradation Alternative will impact three separate subwatersheds to Lower Fish Creek, including unnamed tributaries to Fish Creek, Little Tribble Creek, and the Conner Run Impoundment. Impacts to the Little Tribble Creek watershed are avoided under Alternative 2 (Minimum Degradation Alternative). These differences in watershed impacts are further realized as 6,282 linear feet of stream, including 5,144 linear feet of intermittent stream and 1,138 linear feet of ephemeral stream, are avoided under Alternative 1. Additionally, two wetlands and one open water area will be filled under the Maximum Degradation Alternative, compared to only one wetland impact and one open water area impacted with the Minimum Degradation Alternative design.

Based on the reduced natural resource impacts associated with the Minimum Degradation Alternative design, when compared to the Maximum Degradation Alternative, the Minimum Degradation Alternative is the most viable and practical alternative.



4.0 PROJECT COSTS

The project cost to AEP to permit, construct, and operate the proposed Mitchell Landfill is estimated to be between \$100,000,000 to \$150,000,000.



5.0 SEWAGE PROJECTS

A septic system is proposed to be installed to service trailers/buildings associated with the landfill construction and operation personnel. No other sewage projects are currently proposed in association with construction at the Mitchell Landfill project area.



6.0 OTHER RELATED PROJECTS

6.1 WATERSHED ORGANIZATIONS

In 2005, AEP deeded a parcel of land to The Nature Conservancy (TNC) and funds were allocated for reforestation.

6.2 REGULATORY AGENCIES

CEC is not aware of conservation projects publicly sponsored by federal, state, or local regulatory/resource protection agencies that specifically target improvements in water quality or enhancements of recreational opportunities in the Fish Creek, Little Tribble Creek, or the Conner Run watersheds.

6.3 LOCAL PROJECTS

CEC is not aware of planned commercial or industrial development in the vicinity of the project area. According to the Regional Economic Development Partnership which serves Ohio, Marshall, and Wetzel counties (<http://www.redp.org/properties.php>), there are currently no properties available near the town of Moundsville for the development of industrial or manufacturing facilities.



7.0 WATER POLLUTION CONTROLS

Temporary/permanent impacts to on-site or off-site water quality from construction runoff will be minimized through the implementation of a SWPPP or an Erosion & Sediment Control Plan, which will stipulate the use of BMPs during construction, operation, and restoration at the project area. Specific costs associated with the implementation of BMPs, including the installation of temporary erosion controls such as silt fence and silt socks, and temporary and permanent seeding, are not known at this time. AEP has estimated that the implementation of BMPs associated with construction to be on the order of \$675,000. Additional expenses will be incurred to monitor the BMPs during and after construction.

As a result of the implementation of the Minimum Degradation Alternative/Proposed Site Plan, it is anticipated that the non-contact surface water collected on-site from precipitation will be retained and/or detained within the stormwater management/sedimentation ponds to be located along the perimeter of the landfill. The stormwater management ponds are designed to attenuate the site's post-development peak discharge capacity to a pre-development level. Furthermore, under the Proposed Site Plan, non-contact stormwater will be collected from the landfill and routed into the tributaries of Fish Creek, Little Tribble Creek, and the Conner Run Impoundment, thereby maintaining base flows within downstream portions of these surface waters.



8.0 HUMAN HEALTH IMPACTS

The aquatic resources located on-site and immediately off-site (upstream and downstream) appear to: (1) exhibit moderate to marginal water quality; (2) have limited recreational value; and (3) provide limited benefits to human health. The Minimum Degradation Alternative/Proposed Site Plan is not anticipated to lower the overall water quality and value of the project area's primary receiving aquatic resources, Fish Creek. Therefore, the Minimum Degradation Alternative/Proposed Site Plan is not anticipated to have appreciable impact on human health.



9.0 JOBS CREATED AND REVENUES GAINED

Construction and operation of the proposed landfill will result in the creation of approximately 3 to 6 permanent jobs with anticipated payroll of \$255,000 to \$510,000 per year. Approximately \$102,000 to \$204,000 would be paid in payroll taxes per year. Additionally, 8 to 16 temporary jobs would be created by construction of the proposed landfill. The temporary jobs would have an anticipated payroll of \$780,000 per year and estimated payroll taxes of \$312,000 per year.



10.0 JOBS LOST AND REVENUES LOST

If this project were constructed, no social and economic benefits would be lost. Additionally, there would be no impact on commercial and recreational use of the water resources identified within the project area. As noted in Section 3.2, the aquatic resources within the Site have limited recreational value, and as such the Minimum Degradation Alternative/Proposed Site Plan is not anticipated to lower the overall water quality and value of the site's primary receiving aquatic resources, Fish Creek.

Additionally, if this project were not constructed, the 3 to 6 permanent jobs, as well as the 6 to 12 temporary jobs, would not be realized. This translates into a loss of \$255,000 to \$1,290,000 of estimated payroll per year and a loss of \$102,000 to \$882,000 in payroll taxes per year.



11.0 ENVIRONMENTAL BENEFITS LOST OR GAINED

The aquatic resources located on-site and immediately off-site (downstream), for the most part: (1) maintain marginal to moderate water quality; (2) have limited value; and (3) provide limited benefits to environmental quality. Due to the ephemeral nature of the majority of the streams located within the project area, these aquatic systems do not provide valuable natural functions protective of environmental quality.

The losses and gains of various environmental benefits associated with the two alternatives were discussed in detail in previous sections. Although either of the on-site alternatives would result in a loss of on-site upland habitat, terrestrial flora, and terrestrial fauna, the loss of on-site streams and wetlands will be reduced under the Minimum Degradation Alternative/Proposed Site Plan while still meeting the project purpose and need.

As noted in the off-site alternatives analysis, hauling the waste to the off-site landfills from the Mitchell Plant creates an environmental impact associated with trucking/barge operations. Additionally, gypsum placed within municipal solid waste landfills cannot be reclaimed at a later date, and therefore cannot be remined for later use. The Minimum Degradation Alternative/Proposed Site Plan would reduce the environmental impact associated with fly ash, bottom ash (including pulverizer rejects), CPS filter cake, and gypsum transport and would allow for gypsum reclamation in the future.



12.0 MITIGATION TECHNIQUES

The conceptual stream mitigation plan is provided in Appendix E. A final stream mitigation plan will be prepared and submitted to the USACE and WVDEP prior to issuance of the Clean Water Act Section 404 Permit.