

**TABLE 1
 Federal-Listed Species Identified as Potentially Occurring within Boone County, Kentucky**

Common Name/Species Name ¹	Federal Status ¹	General Habitat Notes
Indiana bat / <i>Myotis sodalis</i>	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well-developed riparian woods and upland forests ³
Northern long-eared bat / <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer, roosts and forages in upland forests ⁴
Bald eagle / <i>Haliaeetus leucocephalus</i>	Protected	Habitat includes estuaries, large lakes, reservoirs, rivers, and some seacoasts. In winter, the birds congregate near open water in tall trees for spotting prey and night roosts for sheltering. ⁶
Orangefoot pimpleback/ <i>Plethobasus cooperianus</i>	Endangered	Prefers clean, fast-flowing water in silt-free rubble, gravel or sand of medium to large rivers. It buries itself in sand or gravel in water as deep as 29 feet. ²
Fanshell / <i>Cyprogenia stegaria</i>	Endangered	Medium to large rivers. Found in areas with a moderate current that have sand and gravel. ²
Pink mucket pearly mussel / <i>Lampsilis abrupta</i>	Endangered	Found in mud and sand in the shallow riffles of major rivers and their tributaries. ²
Sheepnose / <i>Plethobasus cyphus</i>	Endangered	Found in shallow areas of large rivers or streams. Prefers swift to moderate current. ²
Clubshell / <i>Pleurobema clava</i>	Endangered	Prefers clean, loose sand and gravel in medium to small rivers and streams. This mussel will bury itself in the bottom substrate to depths of up to four inches. ²
Rough pigtoe / <i>Pleurobema plenum</i>	Endangered	Found in a wide variety of both large and small streams. It buries itself in bottoms of firmly packed sand or gravel. ²
Ring pink / <i>Obovaria retusa</i>	Endangered	Found in shallow water over silt-free sand and gravel bottoms of large rivers. ²
Running buffalo clover / <i>Trifolium stoloniferum</i>	Endangered	Requires periodic disturbance and a somewhat open habitat to successfully flourish, but it cannot tolerate full-sun, full-shade, or severe disturbance. Found in partially shaded woodlots, mowed areas (lawns, parks, cemeteries), and along streams and trails. ⁵

Notes:

- ¹USFWS, 2014
- ²USFWS, 2015a
- ³USFWS, 2016a
- ⁴USFWS, 2016b
- ⁵USFWS, 2015c
- ⁶USFWS, 2015b

The KSNPC (2016) identified the following species as known occurrences within one mile of the Project area.

TABLE 2
State-Listed Species Identified as Occurring within One Mile of the Project

Common Name/Species Name ¹	State Status ¹	General Habitat Notes
Running buffalo clover / <i>Trifolium stoloniferum</i>	Threatened	Old trails, traces, and roads; grazed bottomlands, streambanks, lawns, shoals, and cemeteries with native vegetation, prairies, well-drained and mesic soils, and filtered to partial light.
Nodding Rattlesnake Root / <i>Prenanthes crepidinea</i>	Species of Concern	Calcareous forests and thickets usually in alluvial areas.
Bachman's Sparrow / <i>Aimophila aestivalis</i>	Endangered	Early successional areas with scattered saplings (often pines), bushes, or understory, brushy or overgrown hillsides, overgrown fields with thickets and brambles.
Henslow's Sparrow / <i>Ammodramus henslowii</i>	Species of Concern	Open fields & meadows with relatively thick/dense grass interspersed with weeds or shrubby vegetation.
Northern Leopard Frog / <i>Rana pipiens</i>	Species of Concern	Breeds in natural and manmade ponds. Otherwise uses moist grassland, meadows and margins.
Northern Metalmark / <i>Calephelis borealis</i>	Threatened	Open meadows and stream sides in forested areas. Often found near shale or limestone outcrops. ²
Six-banded Longhorn Beetle / <i>Dryobius sexnotatus</i>	Threatened	Mature hardwood forests with large trees, particularly elm, maple and beech. ³

¹ KSNPC, 2016

² Xeres Society, 2016

³ Michigan Natural Features Inventory, 2016

Site Observations

CH2M conducted field investigations from March 29 to April 1, 2016, to document existing habitats and hydrological conditions. These field investigations supplemented field investigation previously done by GAI Consultants, Inc. (GAI) in October 2015. CH2M and GAI identified a total of 19 perennial streams, 18 intermittent streams, 35 ephemeral headwaters, and one pond within the Project area. One palustrine scrub-shrub wetland (PSS), nine palustrine emergent wetlands (PEM), and one mixed emergent/scrub shrub/forested wetland (PFO/PSS/PEM) were also identified.

The vegetative cover types present within the Project area include pasture, residential, agricultural field, old field, and secondary growth upland forest. Representative photos of each habitat type can be found in Attachment 2.

Pastureland was located throughout the Project area. Dominant vegetation in these areas consisted of common dandelion (*Taraxacum officinale*), great plantain (*Plantago major*), English plantain (*Plantago*

lanceolata), fescue (*Festuca* sp.), white clover (*Trifolium repens*), red clover (*Trifolium pratense*), multiflora rose (*Rosa multiflora*), broom-sedge (*Andropogon virginicus*), and Queen Anne's lace (*Daucus carota*).

Residences are scattered throughout the Project area. Vegetation observed in residential areas included fescue, white clover, red clover, black walnut (*Juglans nigra*), sugar maple (*Acer saccharum*), meadow garlic (*Allium canadense*), silver maple (*Acer saccharinum*), common dandelion, white pine (*Pinus strobus*), black locust (*Robinia pseudoacacia*), purple dead nettle (*Lamium purpureum*), eastern red-cedar (*Juniperus virginiana*), and amur honeysuckle (*Lonicera maackii*).

Agricultural fields within the Project area are predominantly planted with corn (*Zea mays*).

A small portion of the Project area consisted of old field habitat. Dominant vegetation in old fields included eastern daisy fleabane (*Erigeron annuus*), broom-sedge, purple dead nettle, meadow garlic, multiflora rose, common dandelion, Canadian thistle (*Cirsium arvense*), and American pokeweed (*Phytolacca americana*).

Upland forest areas, though limited within the Project area, were dominated by black walnut, sugar maple, various pine species (*Pinus* sp.), Virginia-creeper (*Parthenocissus quinquefolia*), Eastern poison ivy (*Toxicodendron radicans*), winged sumac (*Rhus copallinum*), sticky-willy (*Galium aparine*), and wood-sorrel species (*Oxalis* sp.).

Palustrine emergent wetlands were identified at several locations along the Project corridor. Dominant vegetation located within PEM wetlands included yellow nutsedge (*Cyperus esculentus*), creeping-jenny (*Lysimachia nummularia*), curly dock (*Rumex crispus*), reed canary grass (*Phalaris arundinacea*), rice cut grass (*Leersia oryzoides*), purple-leaf willowherb (*Epilobium coloratum*), common rush (*Juncus effusus*), arrow-leaf tearthumb (*Persicaria sagittatum*), poverty rush (*Juncus tenuis*), Gray's sedge (*Carex grayi*), hop sedge (*Carex lupulina*), broadleaf cattail (*Typha latifolia*), narrowleaf cattail (*Typha angustifolia*), straw-color flatsedge (*Cyperus strigosus*), and Kentucky blue grass (*Poa pratensis*).

There were two PSS wetlands within the project survey area. Dominant vegetation located within PSS wetland habitat consisted of black willow (*Salix nigra*), ash-leaf maple (*Acer negundo*), eastern cottonwood (*Populus deltoides*), creeping-jenny, broadleaf cattail, purple-leaf willowherb, reed canary grass, and garlic mustard (*Alliaria petiolata*).

There was one PFO wetland within the project survey area. The dominant vegetation within this wetland included ash-leaf maple, eastern cottonwood, creeping-jenny, and spearmint (*Mentha spicata*).

Listed Species Effect Determination

Species-specific surveys have not been conducted for state or federally-listed species within the Project area. However, during field surveys CH2M biologists documented potential habitat for species of concern. No species of concern were observed during field surveys. Preliminary effect determinations are presented below for the species outlined in Table 1 based on the habitats identified in the Project area and the proposed project location and construction approach that will minimize potential impacts.

Running Buffalo Clover

Suitable habitat for running buffalo clover includes partially shaded woodlots or areas between open forest and prairie. Running buffalo clover requires open areas and periodic disturbance to successfully flourish, but is intolerant of full sun, full shade, or severe disturbances (USFWS, 2015c). The closest population of Running buffalo clover exists within Big Bone State Park but is located approximately 0.2 miles from the planned pipeline corridor. There are an additional five populations of running buffalo clover ranging from 0.4 to 0.95 miles from the proposed Project area.

Nodding Rattlesnake Root

Suitable habitat for the nodding rattlesnake root includes calcareous forests and thickets in alluvial areas (KSNPC 2016). One known population of nodding rattlesnake root occurs approximately 0.2 miles south of the Project area. Tree clearing as well as increased erosion and weed invasion is detrimental to this species (KSNPC 2014). No tree clearing or construction will occur within the nodding rattlesnake root population and best management practices (BMPs) will be used to prevent an increase in erosion or weed introduction.

Bachman's Sparrow

Bachman's sparrows prefer brushy habitats typical of early successional areas. They can be found in overgrown clear cuts, powerline ROWs, old pastures and other similar habitats. Habitat destruction is the biggest threat facing Bachman's sparrow (Audubon, 2016). A known population of Bachman's sparrow is approximately one mile from the Project area. The majority of this Project occurs within residential areas or road ROWs that are maintained. Therefore, the impacts to Bachman's sparrow habitat will be minimal. The proposed ROW will be allowed to revegetate after construction so any impacts will be temporary.

Henslow's Sparrow

Henslow's sparrows prefer grassland or meadows with thick grass as well as interspersed shrubs. As with Bachman's sparrows, the recent decline in the Henslow's sparrow population is largely attributed to habitat loss. Impacts to Henslow's sparrow habitat will be minimal. The majority of this Project occurs within residential areas or road ROWs that are maintained and do not provide adequate habitat for the Henslow's sparrow. The proposed ROW will be allowed to revegetate after construction so any impacts will be temporary.

Northern Leopard Frog

Suitable habitat for northern leopard frog includes wet meadows and grasslands while suitable breeding habitat includes both manmade and natural ponds. According the KSNPC, there is a known occurrence of northern leopard frog in an open, fallow field adjacent to the proposed ROW along Beaver Road. During construction, Duke will use BMPs, including a reduced construction zone width in this specific area, to avoid and minimize impacts to the northern leopard frog to the greatest extent possible.

Northern Metalmark

The northern metalmark is typically found in meadows or along stream sides in forested areas associated with shale or limestone outcrops. There will be minimal tree clearing required for this Project,

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approximately 2.8 acres. KSNPC did not provide a location for northern metalmark due to the sensitivity of the species.

Six-banded Longhorn Beetle

Suitable habitat for the six-banded longhorn beetle consists of mature hardwood forests. A location for the six-banded longhorn beetle was not provided by KSNPC due to the sensitivity of this species. However, suitable habitat was not observed along the proposed ROW. Tree clearing will be limited to approximately 2.8 acres and will mainly occur in residential areas.

Conclusion

Tree clearing associated with the Project is estimated at 2.8 acres. This includes the proposed clearing of trees within the planned 30-foot wide, permanently maintained pipeline ROW over the 10.3-mile Project route. Duke plans to conduct all tree removal within the Project area between early March and March 31. Adhering to these tree clearing dates will also minimize impacts to bird species protected under the MBTA.

Wetland impacts within the Project area will be minimized to the extent practical. Based on wetland delineations performed by CH2M, temporary impacts to wetlands may occur during construction of the Project. All PEM wetlands will be allowed to revert to pre-construction conditions. Permanent impacts will be limited to some initial vegetation clearing and continued maintenance of the pipeline ROW. Wetland impacts will be permitted through the U.S. Army Corps of Engineers and Kentucky Division of Water.

We request KDFWR's determination regarding the potential impacts of the Project on state-listed threatened and endangered species. Federally-listed species consultation will be addressed separately with USFWS.

If you have any questions or require additional information, please contact Mike Frank at 513-924-3151 or via email at Mike.Frank@ch2m.com.

Sincerely,



Mike Frank
Project Manager

cc: Mr. Stephen Lane, Duke Energy

Attachments:

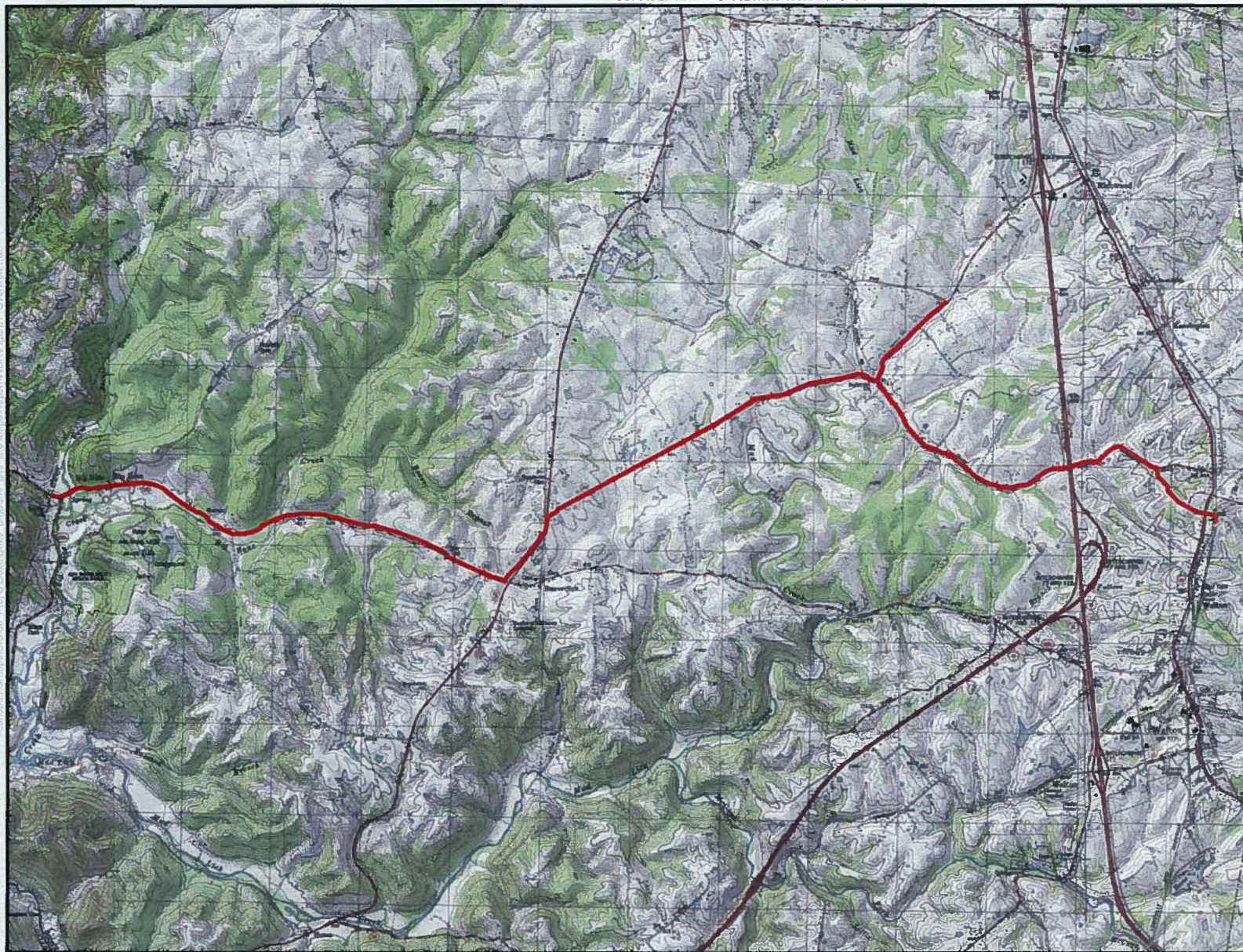
- 1 – Site Location Map
- 2 – Representative Habitat Photolog

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- U.S. Fish and Wildlife Service (USFWS). 2016b. Northern Long-Eared Bat *Myotis septentrionalis*. Revised April 2015. <http://www.fws.gov/midwest/endangered/mammals/nleb/pdf/NLEBFactSheet01April2015.pdf>. Accessed March 18, 2016.
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- Xeres Society. 2016. Metalmarks: northern metalmark (*Calephelis borealis*). <http://www.xerces.org/northern-metalmark/>. Accessed April 15, 2016.

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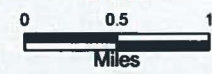
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LEGEND:
— Centerline

BASE MAP SOURCE:
USGS 7.5' Topographic Quadrangles
(Rising Sun 1977, Union 1978,
Independence 1978)

DRAFT



Duke Energy Walton-Big Bone
Natural Gas Pipeline Project,
Boone County, Kentucky

FIGURE 1
OVERVIEW MAP

PN: 673325	DATE: 4/14/2016
CREATED BY: NC	
REVIEWED BY:	

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Photograph 1: Representative view of a Palustrine Emergent (PEM) wetland.



Photograph 2: Representative view of PEM wetland in maintained field within a state park.

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Photograph 3: Representative view of PEM wetland along road.



Photograph 4: Representative view of palustrine scrub shrub wetland.

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Photograph 5: Representative view of intermittent stream and culvert.



Photograph 6: Representative view of a perennial stream.

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Photograph 7: Representative view of a perennial stream.



Photograph 8: Representative view of a residential pond.

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Photograph 8: Representative view of a residential yard within the proposed ROW.



Photograph 9: View of the Abner Gaines House, listed on the National Register of Historic Places, adjacent to the ROW.

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April 15, 2016

Dr. Michael Floyd
U.S. Fish & Wildlife Service
Kentucky Ecological Services
330 West Broadway, Rm 265
Frankfort, Kentucky 40601

**Subject: Federally-Listed Threatened and Endangered Species Impact Assessment
Duke Energy Company
Walton – Big Bone Natural Gas Pipeline Project
Boone County, Kentucky**

Dear Dr. Floyd:

On behalf of Duke Energy (Duke), CH2M Engineers, Inc. (CH2M) requests United States Fish and Wildlife Service's (USFWS) determination regarding the potential impacts of the Project on federally-listed threatened and endangered species for the Walton – Big Bone Natural Gas Pipeline Project (the Project).

Duke is proposing to construct a new 12-inch natural gas pipeline in Boone County, Kentucky. The pipeline will largely parallel Chambers Road, Beaver Road, and Richwood Road for approximately 10.3 miles either within road right-of-way easement (ROW) or on private land immediately adjacent to the road ROW. The route begins near U.S. Route 25 north of Walton, Kentucky, crosses beneath Interstate 71 and ends at a future tie-in connection near the Big Bone Lick State Park on Beaver Road. A site location map depicting the proposed pipeline is provided as Attachment 1. Given the planned alignment adjacent to road ROW and previous land-disturbing activities within the corridor, adverse impacts to threatened and endangered species is expected to be very minimal. Big Bone Creek, an Outstanding State Resource Water, will be avoided by using horizontal directional drilling (HDD) technology to bore well beneath the stream bed. An additional two HDD bores are planned on Gum Branch Creek and an unnamed tributary to Mud Lick Creek just east of the intersection of Richwood and Chambers Roads.

Duke also plans to establish up to three laydown yards to be located along the eastern, central and western sections of the pipeline's alignment. Although these specific locations have yet to be finalized, these yards will be located within active farm fields with no impacts to streams, wetlands or woodlots. Each laydown yard will range from three to four acres in size.

Background Information

CH2M reviewed the USFWS Kentucky Ecological Services Field Station website (USFWS, 2013) for information concerning which federally-listed species were known to occur, or to potentially occur, in Boone County. In addition, CH2M submitted a Data License request to the Kentucky State Nature Preserves Commission (KSNPC) on March 18, 2016, for information on known occurrences of federally-listed and state-listed species within a one-mile radius of the Project area. Duke is currently waiting for a response from KSNPC and will update USFWS upon receipt.

The following Table 1 outlines federally-listed species identified by the USFWS (USFWS, 2013) as occurring, or potentially occurring, in Boone County, Kentucky. Assessments regarding state-listed species will occur under separate consultation with the KSNPC and Kentucky Department of Fish and Wildlife Resources.

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Pastureland was located throughout the Project area. Dominant vegetation in these areas consisted of common dandelion (*Taraxacum officinale*), great plantain (*Plantago major*), English plantain (*Plantago lanceolata*), fescue (*Festuca* sp.), white clover (*Trifolium repens*), red clover (*Trifolium pratense*), multiflora rose (*Rosa multiflora*), broom-sedge (*Andropogon virginicus*), and Queen Anne's lace (*Daucus carota*).

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Listed Species Effect Determination

Species-specific surveys have not been conducted for state or federally-listed species within the Project area. However, during field surveys CH2M biologists documented potential habitat for species of concern. No species of concern were observed during field surveys. Preliminary effect determinations are presented below for the species outlined in Table 1 based on the habitats identified in the Project area and the proposed project location and construction approach that will minimize potential impacts.

Indiana Bat

The range of the Indiana bat includes most of the eastern half of the United States and suitable habitat includes caves and mines, and wooded areas (USFWS, 2016a). In addition to White-nose syndrome, a primary threat to the Indiana bat is human disturbance because they hibernate in large numbers in only a few caves. A single event during hibernation has the potential to affect a large population (USFWS, 2016a).

Assessments for potential Indiana bat habitat were conducted during wetland and waterbody surveys of the Project area. During these investigations, potential summer roosting and foraging habitat was observed in fence rows (trees) as well as forested and residential areas. Surveyed woodlots included Shagbark hickory (*Carya ovata*) and larger silver maple and sugar maple trees, all exhibiting exfoliating bark, characteristic of summer roost habitat. However, the amount of wooded habitat within the Project survey area is limited. Although an extensive field survey for caves and mines in the Project vicinity was not performed, none were observed during the wetland delineation field surveys and no mines are known within 5 miles of the project (Kentucky Division of Mine Safety, 2016).

Proposed tree clearing associated with the Project is estimated at only 2.8 acres. This includes the proposed clearing of trees within the planned 30-foot wide, permanently maintained pipeline ROW. All tree clearing will occur adjacent to the county road ROW. No other forest impacts are anticipated. Tree clearing is proposed to begin in the fall of 2016 after October 15th and as such is proposed to occur outside of the maternity roosting season as per USFWS guidelines.

Northern Long-eared Bat

Suitable habitat for the northern long-eared bat includes caves and mines, and wooded areas. The range of the northern long-eared bat includes much of the eastern and north central United States (USFWS, 2016b). However, no known hibernacula or maternity roost trees are documented in Boone County (USFWS, 2016c). The primary threat to the northern long-eared bat is white-nose syndrome, which has resulted up to a 99 percent decline in the northeastern population of this species since the disease was first observed in 2006 (USFWS, 2016b).

Forested areas with potentially suitable northern long-eared bat habitat were observed within the Project area. However, proposed tree clearing associated with the Project is estimated at only 2.8 acres. This includes the proposed clearing of trees within the planned 30-foot wide, permanently maintained pipeline ROW. All tree clearing will occur adjacent to the county road ROW. No other forest impacts are anticipated. Tree clearing is proposed to begin in the fall of 2016 after October 15th.

Bald Eagle

Bald eagles nest near coastlines, rivers, and large lakes (USFWS, 2015b). Suitable roosting and foraging habitat of bald eagles was noted along Big Bone Creek within the Project area, however, nests were not observed during the field survey. Although the bald eagle was removed from the federal list of threatened and endangered species by the USFWS in August 2007, the bald eagle is protected under the Migratory Bird Treaty Act (MBTA); Bald and Golden Eagle Protection Act; and Lacey Act (USFWS, 2015b). If nests are observed during Project construction, Duke will coordinate further with the USFWS.

Mussel Species

Seven mussel species are identified by the USFWS as potentially occurring in Boone County, Kentucky (USFWS, 2013). Suitable habitat for the orangefoot pimpleback, fanshell, pink mucket pearly mussel, clubshell, rough pigtoe, ring pink and sheepsnose is described in Table 1. There is one Outstanding State Resource Water (OSRW) crossed by the Project, Big Bone Creek. Horizontal direction drilling will be used to install the pipeline underneath the waterway to avoid impacts. All other streams are not likely to support mussel species based on stream characteristics and high sediment load.

Running Buffalo Clover

Suitable habitat for running buffalo clover includes partially shaded woodlots or areas between open forest and prairie. Running buffalo clover requires open areas and periodic disturbance to successfully flourish, but is intolerant of full sun, full shade, or severe disturbances (USFWS, 2015c). The closest population of running buffalo clover exists within Big Bone State Park but is located approximately 0.25 miles from the planned pipeline corridor.

Migratory Bird Treaty Act (MBTA) Compliance

The MBTA provides federal protection to migratory birds, including nests and eggs. Duke recognizes that the MBTA protects both migratory and non-migratory birds, and loss of an active bird nest site, incubating adults, eggs, or young as a result of construction activities would be in violation of the MBTA.

The primary concern for nesting birds is the cutting, clearing, and removal of existing vegetation. Duke has minimized impacts through the siting process by avoiding large tracts of forested land and paralleling existing ROW of roads where feasible. All clearing of forested land is proposed to occur between October 15th and March 31st thereby minimizing the impact to migratory birds during the primary nesting season (early March through mid-July).

Duke Energy has Avian Protection Planning in place that applies to all company work. The Project will be utilizing Duke Energy's existing SPUT and Salvage permits as appropriate. In all circumstances, whether active, inactive or otherwise, upon finding a nest, personnel will immediately call the Duke Energy Midwest Migratory Bird Hotline at (317)-430-4497. This hotline will also be called if there arise issues of injured birds or bird mortalities.

Conclusion

Tree clearing associated with the Project is estimated at 2.8 acres. This includes the proposed clearing of trees within the planned 30-foot wide, permanently maintained pipeline ROW over the 10.3-mile Project route. In order to reduce the potential for take of Indiana bat and northern long-eared bat, Duke proposes

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to conduct all tree removal, including potentially suitable roost trees, within the Project area between October 15 and March 31. Adhering to these tree clearing dates will also minimize impacts to bird species protected under the MBTA.

Wetland impacts within the Project area will be minimized to the extent practical. Based on wetland delineations performed by CH2M, temporary impacts to wetlands may occur during construction of the Project. All PEM wetlands will be allowed to revert to pre-construction conditions. Permanent impacts will be limited to some initial vegetation clearing and continued maintenance of the pipeline ROW. Wetland impacts will be permitted through the U.S. Army Corps of Engineers and Kentucky Division of Water.

We request USFWS's determination regarding the potential impacts of the Project on federally-listed threatened and endangered species. Information that would mitigate potential impacts to listed species and bird species protected under the Migratory Bird Treaty Act is also requested.

If you have any questions or require additional information, please contact Mike Frank at 513-924-3151 or via email at Mike.Frank@ch2m.com.

Sincerely,



Mike Frank
Project Manager

cc: Mr. Stephen Lane, Duke Energy

Attachments:

- 1 – Site Location Map
- 2 – Representative Habitat Photolog

References

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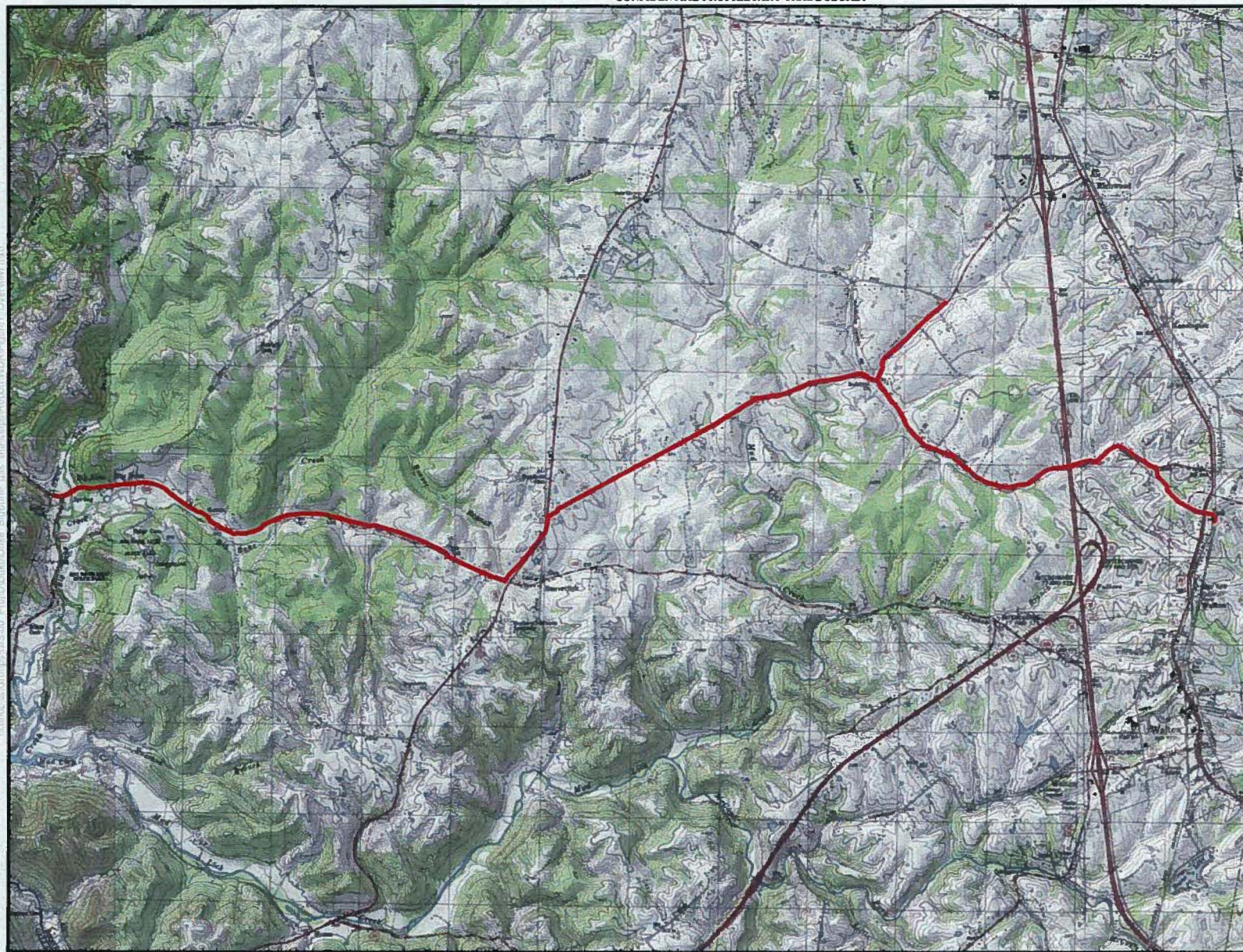
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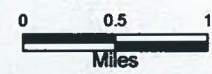
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LEGEND:
— Centerline

BASE MAP SOURCE:
USGS 7.5' Topographic Quadrangles
(Rising Sun 1977, Union 1978,
Independence 1978)

DRAFT



Duke Energy Walton-Big Bone
Natural Gas Pipeline Project,
Boone County, Kentucky

FIGURE 1
OVERVIEW MAP

PN: 673325	DATE: 4/14/2016
CREATED BY: NC	ch2m
REVIEWED BY:	

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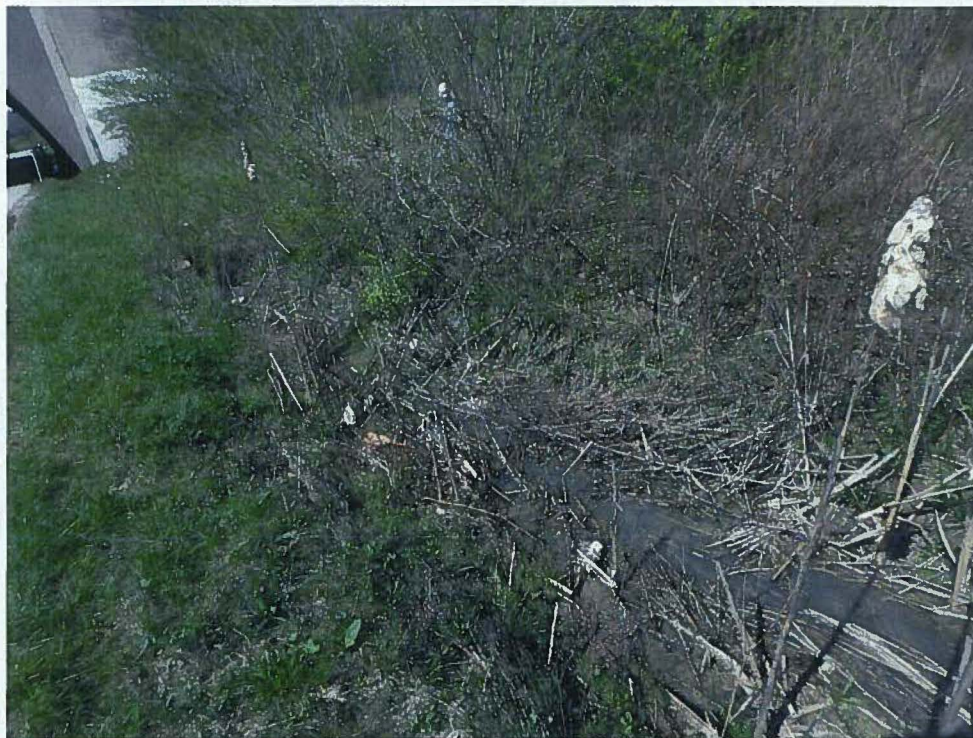


Photograph 1: Representative view of a Palustrine Emergent (PEM) wetland.



Photograph 2: Representative view of PEM wetland in maintained field within a state park.

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Photograph 3: Representative view of PEM wetland along road.



Photograph 4: Representative view of palustrine scrub shrub wetland.

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Photograph 5: Representative view of intermittent stream and culvert.



Photograph 6: Representative view of a perennial stream.

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Photograph 7: Representative view of a perennial stream.



Photograph 8: Representative view of a residential pond.

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Photograph 8: Representative view of a residential yard within the proposed ROW.



Photograph 9: View of the Abner Gaines House, listed on the National Register of Historic Places, adjacent to the ROW.

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April 18, 2016

G141890.03

Mr. Stephen R. Lane
Lead Environmental Scientist/Planner
Duke Energy
1000 East Main Street
Plainfield, Indiana 46168

**Phase I Archaeology Survey Update
Duke Energy
Walton-Big Bone Pipeline Project
Boone County, Kentucky**

Dear Mr. Lane:

GAI Consultants, Inc. (GAI) is pleased to provide you with a summary of archaeological survey activities conducted to date for the proposed Walton-Big Bone Pipeline Project (Project) in Boone County, Kentucky. The Walton-Big Bone Pipeline Project involves: (1) a new pipeline section measuring approximately 10.25-mile long, beginning at the northern terminus just west of the town of Walton and travelling south-southeast to just south of the village of Big Bone, Kentucky; (2) a new pipeline section measuring approximately 0.75-mile long, which will connect to the planned Richwood metering station and the new pipeline planned along Richwood Road; and, (3) a 100x100-foot metering or valve station (Richwood Station).

Agency Consultation

GAI submitted a Kentucky Heritage Council (KHC) Project registration form on October 10, 2015. At the same time, site file information was requested from KHC and the Kentucky Office of State Archaeology (OSA) concerning the project (KHC Registration Number FY16-2288 and OSA Registration Number FY16-8644). Both KHC and OSA were provided preliminary information and a map of the project study corridor during this process. Lori A. Frye, GAI's Principal Investigator, discussed the Project with Nick Laracuent, Archaeology Review Coordinator at KHC on April 8, 2016.

GAI provided a description of our field methods to Duke to provide landowners, including Big Bone Lick State Park, for a permit to conduct an archaeological survey within state park property. Duke contacted Alex Thor at the Tourism, Arts, and Heritage Cabinet, Department of Parks, requesting permission for GAI to conduct a cultural resources survey for the Project area located within park property located along Gum Branch Road and the edge of Big Bone Lick Park. Duke has since made the decision to restrict the Project Area of Potential Effect (APE) to within the Beaver Road and Gum Branch Road rights-of-ways (ROWS), in the portion of the Project corridor that skirts the edge of Big Bone State park.

In addition, the Kentucky Transportation Cabinet was notified concerning the Project. The Kentucky Transportation Cabinet holds a preservation covenant for the National Register Listed Abner Gaines House (BE350). The Kentucky Transportation Cabinet submitted information on the planned Project work on the Abner Gaines property to KHC. The KHC responded in a letter dated March 29, 2016 indicating that the project will have "No Adverse Effect on Historic Properties for this project," referring to the Abner Gaines property. For archaeology, shovel testing, including close interval shovel testing at the directional drilling location, was recommended by KHC for the Abner Gaines property (see Attachment A). Ms. Frye contacted Bill Huser, KHC's Transportation Archaeology Review Coordinator, regarding this property on April 11 and April 15, 2016.

Background Research

A review of the KHC's previously recorded architectural and historical resources (Registration Number FY16-2288) and the OSA's previously recorded archaeological sites (Registration Number FY16-8644) was conducted. These data indicated that 31 previously recorded archaeological sites and 147 architectural/historic resources are located within a 1-mile radius of the proposed Project. Of the previously recorded archaeological sites, eight sites (Sites 15Be436, 15Be437, 15Be438, 15Be447, 15Be449, 15Be450, 15Be451, and 15Be577) fall within the Project area. Background research indicates that previous archaeological investigations have occurred within portions of the Project APE. On April 5, 2016, GAI archaeologists visited OSA's Lexington office to collect additional information on archaeological reports and site forms.

One archaeological National Register of Historic Places (NRHP) listed district, Big Bone Lick Archaeological District, fell within the APE. Archaeological Sites 15Be447, 15Be449, 15Be450, and 15Be451 are contributing resources to the Big Bone Lick Archaeological District and located within Big Bone Lick State Park. Due to difficulties obtaining a permit for the archaeological survey, the Project was re-designed to stay within the Road ROW and avoid the park property.

The Abner Gaines House (Be350) and associated archaeological site (15Be577), located along US 25 north of Walton, are listing in the NRHP and fall within the Project area. As mentioned above, the Kentucky Transportation Cabinet holds a preservation covenant on the Abner Gaines property.

Phase I Field Investigations

On October 15, 2015, GAI conducted a Phase Ia (preliminary field view) of the general project corridor to assess the Project's potential to contain unrecorded cultural resources. A large study corridor was used for this study to provide information on cultural resource potential in the general project vicinity.

From March 29 to April 6, 2016, GAI conducted a Phase Ib archaeological survey for most of the Project APE. All of the field survey was completed between Stations 0+00 and 12+20; Stations 20+00 and 25+00; Stations 61+00 and 73+00; Stations 75+0 and 489+63; and the segment running along Richwood Road from its intersection with Chambers Road to its intersection with Hicks Pike (Stations 0+0 to approximately 39+40). During this time period, 507 shovel tests were excavated, of which seven produced historic or prehistoric artifacts (see Table 1).

Table 1. Summary of Phase IB Subsurface Testing Results to April 6, 2016.

Study Area	Coverage area by Stations	Landform	Vegetation	# STPs	# Positive STPs	Comments
1	180+08-213+50	Gently rolling uplands	Lawns and pastures	29	0	
2	213+50-242+50	Rolling uplands	Lawns and pastures	39	0	
3	242+50-272+50	Rolling uplands	Lawns and pastures	42	0	
4	272+50-309+00	Rolling uplands and a moderately steep hillside	Lawns and hay, wheat, and clover fields	48	0	
5	309+00-343+00	Rolling uplands and a moderate hillslope	Grassy fields	38	0	
6	345+00-377+50	Bottomland to toe of slope	Lawns, shrub nursery	38	0	
7	377+50-434+00	Toe of slope	Fallow field, lawns, grassy field	64	0	434+00 is at edge of I-75
8	434+00-489+63	Moderate to steep uplands	Fallow fields and pasture	48	0	
9	343+00-345+00 and 1+00 to 39+50	Stream terrace and base of hillslope	Lawns	52	0	Includes all of the Richwood Road segment

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Study Area	Coverage area by Stations	Landform	Vegetation	# STPs	# Positive STPs	Comments
10	75+00-156+00	Terrace, toe of slope, steep hillside, hilltop	Lawns and pasture	37	0	
11	156+00-180+08	Gently sloping uplands	Pasture, lawns	25	0	
12	61+00-73+00	Broad low terrace, narrow high terrace	Scrub, woodlot margin, hayfield	25	4	Ten lithic debitage at 15BE436
13	0+00-12+20	Floodplain, terrace	Fallow fields	12	0	
14	20+00-25+00	Edge of floodplain, steep slope	Tall grasses	0	0	Disturbed and steep slope
15	489+63-501+76	Broad upland flat and gently slope	Lawns	6	3	Directional Drill from 489+63-499+44; 5 artifacts (2 nails, 1 nut, 1 window glass, 1 plastic) at 15Be577 (Abner Gaines Site)
TOTAL				503	7	Positive STPs fell within 2 previously recorded sites


Field investigations were halted prior to completion of field investigation to resolve issues associated with:
 (1) testing along Beaver Road where the Project corridor extends into the border of Big Bone Lick State Park;
 (2) testing along Beaver Road in the area of a former cemetery that was relocated in ca. 1941; and
 (3) clarifying testing requirements within the Abner Gaines NRHP-listed historic/architectural and archaeological listed resources. Based on resolution of these issues, GAI will complete the field survey. This resolution includes: (1) testing within the Beaver Road ROW where it borders Big Bone Lick State Park; (2) testing a reroute that avoids the former cemetery location; and (3) testing along a 30-foot wide easement across the Abner Gaines Property (approximately between Stations 497+20 and 499+50).

As currently designed, Sites 15Be436, 15Be437, 15Be438, 15Be447, 15Be449, 15Be450, and 15Be451 no longer fall within the Project APE, either due to a re-route or a restriction of the APE to the Beaver Road ROW along its border of Big Bone Lick State Park.

If you have any questions or concerns, please feel free to contact Ms. Frye at 412-399-5262 or via e-mail at l.frye@gaiconsultants.com.

Sincerely,
GAI Consultants, Inc.


 Lori A. Frye, M.A., RPA
 Senior Project Archaeologist


 Eric Scuoteguazza, M.A., M.B.A., RPA
 Cultural Resources Group Manager

LAF/pcn
 Attachment: Attachment 1 (KHC Correspondence)

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ATTACHMENT 1
KHC CORRESPONDENCE

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MATTHEW G. BEVIN
GOVERNOR

DON PARKINSON
SECRETARY

**TOURISM, ARTS AND HERITAGE CABINET
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REGINA STIVERS
DEPUTY SECRETARY

CRAIG A. POTTS
EXECUTIVE DIRECTOR
& STATE HISTORIC
PRESERVATION OFFICER

March 29, 2016

Mr. Greg Thomas
Acting Secretary
Kentucky Transportation Cabinet
200 Mero Street
Frankfort, KY 40622

**Re: Transportation Enhancements, Easement Review for Plans, Boone County/Walton,
Abner Gaines House, Utility Line Burial**

Dear Mr. Thomas,

Thank you for your letter and technical information concerning the above-referenced project. As we understand, Duke Energy proposes to install a length of deeply buried pipeline across the northern yard of the Abner Gaines House, a National Register-listed property for which the Kentucky Transportation Cabinet holds a preservation easement. Duke Energy plans to install the pipeline by directional boring, which will require the digging of a 30' x 6' x 6' trench on the Gaines property. As we further understand, Duke Energy plans to conduct an archaeological survey for this project, entailing pedestrian survey and the hand excavation of shovel test probes.

For architecture, as the project will have no above-ground visual expression on the Abner Gaines property, we concur with your recommendation of No Adverse Effect on Historic Properties for this project.

For archaeology, according to our files, an archaeological survey of the Abner Gaines property was conducted in 2008*. That survey, which entailed visual examination, the hand excavation of systematic shovel test probes, remote sensing, and cursory archival research, found no significant archaeological remains within the currently proposed Duke Energy 30' pipeline easement across the property. Nevertheless, we recommended that the Abner Gaines property be investigated by the archaeological survey planned for the pipeline and we specifically recommend that close-interval shovel testing be conducted at the location of the planned pipeline installation trench. For archaeology, we *conditionally concur* with your recommendation of No Adverse Effect on Historic Properties, conditional upon the results of the planned archaeological survey for the project.

#Preservation50: Commemorating the 50th anniversary of the National Historic Preservation Act
and the Kentucky Heritage Council 1966-2016

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Should the project plans change, or should additional information become available regarding cultural resources or citizens' concerns regarding impacts to cultural resources, please submit that information to our office as additional consultation may be warranted. Should you have any questions, feel free to contact Bill Huser of my staff at 502.564.7005, extension 151.

Sincerely,

Craig A. Potts,
Executive Director and
State Historic Preservation Officer

CP: KHC 46553
Cc: Mike Jones (KYTC)

*

Kreinbrink, Jeannine

2008 *Archaeology Survey Results for the Gaines Tavern (15Be577), City of Walton, Boone County, Kentucky.* Prepared by Natural & Ethical Environmental Solutions, West Chester, Ohio. Submitted to Boone County Historic Preservation Review Board, Burlington, Kentucky. Report on file at the Kentucky Heritage Council, Frankfort.