CONFIDENTIAL PROPRIETARY TRADE SECRET

CH2M
400 E. Business Way
Suite 400
Cincinnati, OH 45241
Tel 513.530.5520

April 21, 2016

Mr. David E. Baldridge, South Section Chief
U.S. Army Corps of Engineers
600 Dr. Martin Luther King Jr. Place
OP-FS, Room 752
Louisville, KY 40202-2239
[Ph: 502-315-6675]

Subject: Duke Energy
Walton-Big Bone Natural Gas Pipeline Project
Boone County, Kentucky
Nationwide Permit 12 – Utility Line Activities

Dear Mr. Baldridge:

On behalf of Duke Energy (Duke), CH2M HILL Engineers, Inc. (CH2M) hereby submits this Preconstruction Notification (PCN) for purposes of confirming authorization under Nationwide Permit (NWP) 12 for the proposed Walton-Big Bone Natural Gas Pipeline Project (Project), a 10.3-mile planned pipeline in Boone County, Kentucky.

Duke has designed the Project utilizing several measures to minimize the impact on waterbodies and wetlands during construction activities to the extent practical while also fulfilling the Project's technical objectives for Duke's gas transmission system. The Project will temporarily impact 62 waterbodies and nine wetlands during construction. The temporary impacts would occur either 1) as a result of the pipeline construction trench crossing the particular waterbody or wetland or 2) as a result of the waterbody or wetland being within the remaining construction corridor and thus being temporarily impacted by equipment traffic or temporary spoils piling. Once the pipeline is installed and restoration completed, no additional or long-term impacts to these resources are expected as a result of the Project. The Application for Department of the Army Permit (ENG Form 4345) is included as Attachment 1.

Duke is submitting this Project for the Corps' review in the form of a PCN simply as confirmation that the Project is authorized by NWP 12. None of conditions for notification (i.e., PCN) to the Corps is triggered by the anticipated extent of impacts to jurisdictional waters, namely the fact that the Project does not involve a Section 10 permit, less than 500 feet of utility line will be placed within the jurisdictional area for a specific stream or wetland crossing, and less than 1/10-acre of a wetland will be crossed.

Purpose and Need

The purpose of the Project is to construct necessary capacity to the Duke Energy Kentucky natural gas delivery system to meet anticipated demand and to provide greater reliability to the overall system. In their current configuration, the AM03 and UL03 pipelines cannot be separated without negatively impacting customers. This impact could occur either in the winter due to increased system demand or during summer months if there is a triggering event such as a pipeline breach caused by excavation or some other incident. The proposed pipeline will provide a new interconnection point between these two pipelines in the center of Duke Energy Kentucky's system where additional reliability, supply and pressure are necessary to continue to provide customers with adequate natural gas service. The proposed

connection from Big Bone to the existing system at Richwood will provide a beneficial supply loop for this 100 plus square miles of service territory. The Project will also provide additional feeds to the system to support continued growth in southern Boone and Kenton Counties and will provide system flexibility to back-feed portions of both the UL03 and AM03 pipeline segments in the event of scheduled or emergency work.

Proposed Facilities

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 both outside and inside of the county road right-of-way easements. 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. The project also involves the construction of two small pressure regulating stations (approximately 20 feet by 20 feet in size). One station is located at the corner of Chambers Road and Richwood Road. The second station is located at the east end of the Project off of Nicholson Road. Duke also may establish as many as 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 only be located within active farm fields with no expected impacts to streams, wetlands or woodlots. Each laydown yard is expected to range from three to four acres in size. Once identified, the locations of the proposed laydown yards will be surveyed for potential wetlands, streams, special status species habitat, and cultural resources. Any potential impacts requiring additional notification will also be submitted to your office for consideration.

Construction impacts will be limited to a 50-foot wide corridor along the proposed pipeline, 20 feet of that 50 feet only to be used for light vehicle access, pipe welding, and soil side-casting. Temporary impacts will be limited to a 30-foot wide corridor at wetland and waterbody crossings.

A site location map is provided as Attachment 2.

Project Schedule

Duke plans to perform tree clearing activities for the Project beginning in early 2017 to be concluded before March 31 to avoid potential direct impacts to federal-listed bat species and migratory birds. Duke proposes to begin actual Project construction (installation of pipe) in approximately April 2017 with a planned completion/in-service date of November 1, 2017.

Water Resources within the Project Area

A wetland and waterbody delineation was conducted within the Project area from March 29, 2016 to April 1, 2016. A copy of the Wetland and Waterbody Delineation Report (WDR) is available as Attachment 3. Field investigations of the Project area identified a total of 62 waterbodies and 9 wetlands located within the proposed construction workspace. Note that equipment crossings will not occur within waterbodies. Within wetlands, equipment crossings will be necessary for access but will be minimized. Wood matting will be utilized to minimize wetland surface impacts outside the pipe trench. Duke is requesting a preliminary jurisdictional determination for this Project in conjunction with this PCN submittal. A preliminary jurisdictional determination form is included as Attachment 4. Figures showing the water resources in the right of way (ROW)/Construction Impact Corridor are provided as Figure 4 in Attachment 3.

The Project is entirely within the Middle Ohio-Laughery 8-digit Hydrologic Unit Code (HUC 05090203). The Project crosses two 12-digit Hydrologic Unit Code (HUCs) including Big Bone Creek (HUC 050902031003) and Mud Lick Creek (HUC 050902031001).

Proposed Waterbody Impacts

A total of 62 waterbodies are located within the reduced 30-foot wide construction work area specified for these sensitive areas, including 18 perennial streams, 15 intermittent streams, and 29 ephemeral streams. Note that many of the ephemeral waterways identified would also be classified as roadside drainage ditches. Fifty-one of these streams will be crossed by the centerline of the proposed pipeline.

The Stream Impact Table in Attachment 5 contains detailed stream crossing information. Impacts due to stream crossings will be temporary in nature and will consist of trench excavation, installation of the new pipeline, and native backfill. No permanent in-stream impacts such as introduced permanent fill or rip-rap are proposed. In particular, please note the information contain under the column label "Crossing Method/Comments". Project Alignment Sheets, used for project engineering and planning, are included as Attachment 6. Representative photographs of streams crossed by the Project can be found in the WDR located in Attachment 3.

In general, Duke will require a 30-foot construction corridor through waterbodies to allow for installing equipment typically using dry-ditch crossing methods. One stream, Big Bone Creek (SKY-CDK-006), is designated as a Kentucky Outstanding State Water Resource (OSWR) and will be crossed using the horizontal direction drilling (HDD) method. Therefore, it is not expected to be impacted by the Project. Two additional streams (SKY-CDK-008 [Gum Branch] and SKY-CDK-018 [UNT to Mud Lick Creek]) will also be crossed using the HDD method and, therefore, are expected to have no temporary or permanent impacts. Duke proposes to cross remaining streams that have perceivable flow using either the dry-ditch crossing method (if flow rates are very low), the flume method or the dam and pump method. Typical stream crossing drawings are included in Attachment 7. Upland construction techniques will be used to cross ephemeral streams and ditches when there is no perceivable flow at the time of crossing. At these locations, equipment to complete a dry-ditch crossing will be onsite as a contingency in case stream flow should begin during construction. Appropriate sediment and erosion controls measures as required by KYR10 will be employed at all stream crossing locations.

Construction techniques within streams will be consistent with the conditions prescribed within the federal and state permits (e.g., Section 401 Water Quality Certification conditions) to minimize the potential for impacts to waterbodies. The following sections describe the construction techniques that are proposed for the Project.

Dam and Pump Crossing Method

The dam and pump method involves installing temporary dams upstream and downstream of the proposed waterbody crossing location. The temporary dams typically will be constructed using sandbags and plastic sheeting. Following dam installation, appropriately sized pumps will be used to dewater the upstream impoundment and transport the stream flow around the construction work area (CWA) and trench to the downstream side of the work area. Intake screens will be installed at the pump inlets to prevent entrainment of aquatic life, and energy dissipating devices will be installed at the pump discharge point to minimize erosion and streambed scour. Trench excavation and pipeline installation then will commence through the dewatered portion of the waterbody channel. Following completion of pipeline installation, backfill of the trench, and restoration of stream banks, the temporary dams will be removed and flow through the CWA will be restored. This method is appropriate for those waterbody crossings where pumps can adequately transfer the stream flow volume around the work area and there are no concerns about the temporary passage of aquatic species.

Flume Crossing Method

The flume crossing method will consist of temporarily directing the flow of water through one or more flume pipes over the area to be excavated. This method will allow excavation of the pipe trench across the waterbody completely underneath the flume pipes without disruption of water flow in the stream. As shown in Attachment 7, stream flow will be diverted through the flumes by constructing two bulkheads, using sand bags or plastic dams, to direct the flow through the flume pipes. Following completion of pipeline installation, backfill of the trench, and restoration of stream banks, the bulkheads and flume pipes will be removed. This crossing method minimizes the duration of downstream turbidity by allowing excavation of the pipeline trench under relatively dry conditions, and can be used at crossings where the temporary passage of aquatic species is a concern (not applicable to this Project).

HDD Crossing Method

Three waterbodies, Big Bone Creek (SKY-CDK-006), Gum Branch (SKY-CDK-008), and UNT to Mud Lick Creek (SKY-CDK-018) will be crossed using the HDD method and, therefore, will not be impacted by the Project. HDD is a trenchless construction technique commonly used for large stream crossings and for avoiding impacts to sensitive streams. This method utilizes steerable drilling to install pipe under a stream along a prescribed bore path. HDD requires the excavation of an entry and exit pit to accommodate the drill string. HDD construction also requires large additional temporary workspaces to accommodate the drill rig, equipment, drill and supply trailers, fuel, drilling mud, frac tanks, and vehicle parking. Additional temporary workspace (called false ROW) may also be required for the drill string where the pipeline ROW changes direction at or near the crossing. An HDD Profile Drawing is provided in Attachment 6. A copy of Duke's HDD Contingency Plan is included as Attachment 8.

Pipeline Depth

Duke will install the pipeline a minimum of three feet (top of pipe) below streambeds or at an appropriate depth to avoid the potential for scour, which may expose or uncover the pipe. Where practical, material excavated from the trench will be stockpiled above the stream banks and used as backfill, unless precluded by federal or state permit conditions. In addition, excess material will be removed from waterbodies and their floodplains, and original contours will be restored, to the extent practicable. Sediment filtering devices will serve as sediment barriers to minimize the potential for transport of sediment-laden runoff into waterbodies. Concrete weights or coatings may be required to provide negative buoyancy at stream crossings and in floodplains.

Proposed Wetland Impacts

A total of 9 wetlands have been identified within the Project construction work area. The wetland impact table in Attachment 5 provides a list of wetlands impacted by the Project, wetland classification, crossing length, and construction and operation impact acreages.

Temporary impacts to wetlands will include loss of vegetation during the construction phase. There will be no permanent filling or loss of wetlands from construction or operational components of the Project. The Project will not result in impacts to palustrine forested wetland (PFO) areas. Limited conversion of palustrine scrub-shrub (PSS) wetland to palustrine emergent wetland (PEM) will occur. As identified in the wetland impact table included in Attachment 5, there will be a total of 0.22 acre of disturbance to wetlands, of which approximately 0.045 acre is PSS wetlands, and approximately 0.175 acre of PEM wetlands. The 0.045 acres of PSS wetlands will be permanently impacted by the Project and will be maintained in a PEM state for the life of the pipeline. PEM wetlands impacted during construction will be allowed to return to their previous PEM condition; therefore, there will be no permanent impacts associated with construction in emergent wetlands.

Construction in wetlands will be performed in accordance with the techniques specified in the conditions of federal and state permits, including the segregation of top soils excavated from wetlands with replacement of these same soils back into the wetland during restoration. The main objective of a wetland crossing is to construct the pipeline and restore the original contour of the wetland as close as practicable. Duke will utilize a 30-foot-wide construction work area through wetlands, where practicable. Vegetation will be cut off just above ground level, leaving existing root systems in place, and will then be removed from the wetland for disposal. Grading in wetlands will consist of the minimum necessary for safe and efficient equipment operation. The pulling of tree stumps and grading activities will be limited to areas directly over the trench line.

Typical wetland construction drawings have been included in Attachment 9. Topsoil and subsoil will be segregated and restored separately. The top 6 to 12 inches (e.g., or where top soil depth ends) of the trench will be backfilled with topsoil from the trench, as specified in the NWP 12 conditions.

Avoidance and Minimization

Duke has planned and engineered the proposed work to avoid wetland and waterbody impacts where practicable. Where avoiding impacts was not feasible, Duke sought to minimize impacts during the siting, planning, and engineering phases of the Project. In addition, Best Management Practices (BMPs) will be utilized during construction to reduce/minimize impacts to wetlands and waterbodies.

Best Management Practices during Project Construction

To meet the requirements of the NWP, construction activities within wetlands and waterbodies will be conducted in accordance with federal and state permit conditions. Appropriate construction techniques will be used to prevent turbidity resulting from erosion of adjacent areas during and after construction, and erosion control measures will be implemented to minimize siltation, sedimentation, and other impacts that may temporarily affect surface waterbodies in the construction area and during operation. Efforts will be made before, during, and after construction to minimize the extent and duration of Project-related disturbances to wetland and other waters resources.

Duke will avoid and minimize potential adverse impacts to wetlands and waterbodies by implementing the following techniques as appropriate. Other techniques may be identified later that can be implemented in addition to, or in lieu of, the following:

- Duke or its contractor will not utilize mechanized land-clearing within a forested wetland.
- Adequate downstream flow rates will be maintained during construction to protect aquatic life and prevent the interruption of existing downstream uses.
- Each waterbody crossing will be treated as a separate construction entity, such that trenching, pipe installation, backfilling, and temporary stabilization or final restoration is completed in the minimum number of consecutive calendar days practical.
- In general, the construction work area width will be limited to 30-feet.
- Construction areas will be inspected periodically during and after construction. Erosion controls will be repaired, as needed, in a timely manner.
- Duke has prepared a Project-specific Spill Prevention, Containment, and Countermeasures (SPCC Plan) (Attachment 10) to prevent and mitigate potential spills.
    - Generally, Duke will prohibit construction equipment, vehicles, hazardous materials, chemicals, fuels, lubricating oils, and petroleum products from being parked, refueled and stored within 100 feet of waterbody, pond, wetland, springs, or seep areas.

- Equipment will be checked for leaks by an inspector prior to beginning construction activities in waterbodies or wetlands.

- Duke has prepared an HDD contingency plan to prevent and mitigate inadvertent releases from HDD activities (Attachment 8).
- Duke will stabilize waterbody banks and install permanent sediment barriers/sediment filter devices within 24 hours of completing the crossing. For dry-ditch crossings, Duke will complete streambed and bank stabilization before returning flow to the waterbody channel.
- Liquid mulch binders will not be used on the Project.
- For each waterbody crossed, Duke will install a permanent interceptor diversion/slope breaker and a trench breaker at the base of slopes near the waterbody. Duke will locate the trench breaker upslope of the interceptor diversion/slope breaker.
- No equipment bridges are planned for the project.
- Duke will return waterbody banks to preconstruction contours or to a stable angle of repose.
- Duke will re-vegetate disturbed riparian areas with native herbaceous plant species.
- Duke will minimize grubbing within wetlands and within 25 feet of intermittent and perennial stream channels to only that required for the pipeline trench.
- Sediment filter devices will be removed once permanent re-vegetation is successfully established.
- Matting will be used to protect the underlying soil and root stock, where applicable.

Compensatory Mitigation

Impacts to wetlands and streams within the Project area will be temporary; pre-construction contours will be restored, and the sites will be stabilized after construction. No net loss of wetlands will occur as a result of Project construction. For areas within the new permanent ROW, approximately 0.045 acre of PSS wetlands will be permanently altered by the Project and will be maintained in an emergent state for the life of the pipeline. PEM wetlands impacted during construction will be allowed to return to their previous PEM condition; therefore, there will be no permanent impacts associated with construction in emergent wetlands.

Since there will be no loss of wetlands during construction, Duke is not proposing compensatory mitigation for the Project.

Threatened and Endangered Species Consultation

CH2M reviewed the USFWS Kentucky Ecological Services Field Station website for information concerning which federally-listed species were known to occur, or to potentially occur, in Boone County. Consultation was initiated with the USFWS on April 15, 2016 to confirm documented occurrences of federal-listed threatened and endangered (T&E) species or habitat potentially suitable for such species within areas proposed for disturbance. Duke has not yet received a response from the USFWS.

A request was sent to Kentucky Department of Fish and Wildlife Resources (KDFWR) on April 18, 2016, to confirm documented occurrences of federal- and state-listed T&E species and species of special concern or habitat potentially suitable for such species within areas proposed for disturbance. Duke is currently waiting for a response from KDFWR.

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.

KSNPC responded on April 12, 2016, to Duke's initial data request. Their database search indicated that seven threatened, endangered or species of concern are known within one mile of the Project. These species include one federal-endangered and KSNPC-threatened species: running buffalo clover (*Trifolium stoloniferum*); one KSNPC-endangered species: Bachman's sparrow (*Aimophila aestivalis*); two KSNPC-threatened insects: northern metalmark (*Calephelis borealis*) and six-banded longhorn beetle (*Dryobius sexnotatus*); and three KSNPC-species of concern: nodding rattlesnake root (*Prenanthes crepidinea*), northern leopard frog (*Rana pipiens*), and Henslow's sparrow (*Ammodramus henslowii*).

T&E species letters are included in Attachment 11.

Cultural Resources Consultation

GAI Consultants, Inc. (GAI) conducted preliminary desktop research for Kentucky Heritage Council (KHC) architectural and historical resources and Kentucky Office of State Archeology (OSA) previously recorded archeological sites within one mile of the Project. This research indicated that there were 31 previously recorded archeological sites and 147 architectural/historical resources located within one mile of the Project. Eight of these previously recorded archeological sites (Sites 15Be436, 15Be437, 15Be438, 15Be447, 15Be449, 15Be450, 15Be451, and 15Be577) are located within the Project area. Previous archeological investigations have been performed within portions of the Project area. GAI visited OSA's Lexington office to obtain information about the previous investigations

GAI submitted a KHC Project registration on October 10, 2015. Upon request, preliminary Project information as well as a map of the Project area were provided to KHC and OSA (KHC Registration Number FY16-228 and OSA Registration Number FY16-8644).

GAI also notified Kentucky Transportation Cabinet concerning the Project because the Kentucky Transportation Cabinet holds a preservation covenant for the National Register Listed Abner Gaines House (BE350). KHC received information from Kentucky Transportation Cabinet about the proposed Project work within the Abner Gaines property. KHC responded stating that the Project will have "no adverse effect on historic properties," but they recommended close interval shovel testing at the directional drill location on the Abner Gaines property.

Phase Ia (preliminary field view) investigations were conducted along the Project area on October 15, 2015 to assess the Project's potential for unrecorded cultural resources. From March 29 to April 6, 2016, GAI conducted a Phase Ib archeological survey for most of the Project area. The 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. The portions of the Project area that were not surveyed during the initial Phase Ib investigations, additional test pits at the Abner Gaines property and a re-route to avoid a previously unknown cemetery, will be surveyed from April 20 to April 22, 2016.

A copy of GAI's archeological activities and consultation letter with KHC are included in Attachment 12. A copy of the Phase Ib report can be provided at request once it is completed.

Required Permits

A list of the required permits and approvals, administering agencies, and status of correspondence are included in the Table 3 below.

TABLE 2
Anticipated Environmental Permits, Approvals, and Consultations for the Project

Permit/Approval/Consultation	Administering Agency	Filing Date (Anticipated)	Receipt Date (Anticipated)
Federal			
Clean Water Act Section 404 Nationwide Permit 12	USACE – Louisville District	April 19, 2016	June 2, 2016
Section 7 Threatened and Endangered (T&E) Species Consultation and Clearance, Migratory Bird Treaty Act compliance	United States Fish and Wildlife Service – Kentucky Ecological Services Field Station	April 15, 2016	May 18, 20168
State			
Clean Water Act Section 401 Water Quality Certification and Kentucky Department of Water Permit to Construct Across or Along a Stream	Kentucky Department of Environmental Protection	April 22, 2016	May 24, 2016
Kentucky Pollutant Discharge Elimination System (KPDES) General Permit (KYR100000) for Storm Water Discharges Associated with Construction Activities		July 12, 2016	July 19, 2016
KPDES General Permit for Hydrostatic Test Water Discharges and Groundwater Protection Plan		May 1, 2017	May 8, 2017
Section 106 of the National Historic Preservation Act Clearance	Kentucky Heritage Council - State Historic Preservation Office	To be determined.	To be determined.
State T&E Species Consultation and Clearance	Kentucky Department of Fish & Wildlife Resources	April 18, 2016	May 18, 2016
State T&E Species Consultation and Clearance	Kentucky State Nature Preserves Commission	April 18, 2016	May 18, 2016

Conclusion

CH2M hereby submits the attached PCN Section 404 NWP 12 package and Request for Jurisdictional Determination on behalf of Duke. Note that Duke will apply for an Individual 401 permit due to cumulative linear feet of stream impacts exceeding 300 feet. As you review the permit application package for completeness, please contact me with questions about the Project, where to find specific information in the package, or data needs at 513-924-3151 or mike.frank@ch2m.com.

Sincerely,
CH2M HILL Engineers, Inc.

Mike Frank

Mike Frank
Project Manager

Attachments: Attachment 1 – Department of the Army Permit ENG 4345 Form
Attachment 2 – Site Location Map
Attachment 3 – Wetland and Waterbody Delineation Report
Attachment 4 – Preliminary Jurisdictional Determination Form
Attachment 5 – Wetland and Stream Impact Tables
Attachment 6 – Project Alignment Sheets
Attachment 7 – Typical Stream Crossing Drawings
Attachment 8 – HDD Contingency Plan
Attachment 9 – Typical Wetland Crossing Drawings
Attachment 10 – Spill Prevention, Containment and Control Plan
Attachment 11 – Threatened and Endangered Species Consultation
Attachment 12 – Cultural Resources Consultation
Attachment 13 – Adjoining Property Owners

CC: Mr. Steve Lane, Duke Energy

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U.S. ARMY CORPS OF ENGINEERS
APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT
33 CFR 325. The proponent agency is CECW-CO-R.

Form Approved - OMB No. 0710-0003 Expires: 30-SEPTEMBER-2015

Public reporting for this collection of information is estimated to average 11 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of the collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters, Executive Services and Communications Directorate, Information Management Division and to the Office of Management and Budget, Paperwork Reduction Project (0710-0003). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. Please DO NOT RETURN your form to either of those addresses. Completed applications must be submitted to the District Engineer having jurisdiction over the location of the proposed activity.

PRIVACY ACT STATEMENT

Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public and may be made available as part of a public notice as required by Federal law. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued. One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and/or instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETE

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME	8. AUTHORIZED AGENT'S NAME AND TITLE (agent is not required)
First - Stephen Middle - R Last - Lane	First - Mike Middle - Last - Frank
Company - Duke Energy	Company - CH2M HILL
E-mail Address - Steve.Lane@duke-energy.com	E-mail Address - Mike.Frank@ch2m.com
6. APPLICANT'S ADDRESS:	**9. AGENT'S ADDRESS:**
Address- 139 East 4th Street	Address- 400 East Business Way, Suite 400
City - Cincinnati State - OH Zip - 45202 Country - US	City - Cincinnati State - OH Zip - 45241 Country - US
7. APPLICANT'S PHONE NOs. w/AREA CODE	**10. AGENTS PHONE NOs. w/AREA CODE**
a. Residence b. Business 513-287-2379 c. Fax	a. Residence b. Business 513-924-3151 c. Fax

STATEMENT OF AUTHORIZATION

11. I hereby authorize, CH2M HILL to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

SIGNATURE OF APPLICANT — DATE 04/18/16

STEPHEN R. LANE – DUKE ENERGY

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions)
Walton-Big Bone Natural Gas Pipeline Project

13. NAME OF WATERBODY, IF KNOWN (if applicable)	14. PROJECT STREET ADDRESS (if applicable)
Multiple, see Attachment 5 of application package	Address
15. LOCATION OF PROJECT Latitude: -N See Attachment 5 Longitude: -W See Attachment 5	City - State- Zip-

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions)
State Tax Parcel ID Municipality See maps provided in Attachment 2 of this application package
Section - Township - Range -

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17. DIRECTIONS TO THE SITE
To the approximate Project center: from Cincinnati, take I-71 S to Boone County. Take exit 175 from I-71 S/I-75 S. Continue on Richwood Rd. Drive for approximately 4.9 miles to KY-338 N.

18. Nature of Activity (Description of project, include all features)
Duke is proposing to construct a new 12-inch natural gas pipeline in Boone County, Kentucky. See the 'Proposed Facilities' Section of the application package cover letter for detailed information on the proposed project. See Attachment 5 of this application package for detailed information on wetland and waterbody impacts.

19. Project Purpose (Describe the reason or purpose of the project, see instructions)
The purpose is to construct necessary capacity to the Duke Energy Kentucky natural gas delivery system to meet anticipated demand and to provide greater reliability to the overall system. In their current configuration, the AM03 and UL03 lines cannot be separated without negatively impacting customers. This impact could occur either in the winter due to increased system demand or during summer months if there is a triggering event such as a pipeline breach caused by excavation or some other incident. The proposed pipeline will provide a new interconnection point between these two pipelines in the center of Duke Energy Kentucky's system where additional reliability, supply and pressure are necessary to continue to provide customers with adequate natural gas service. The proposed connection from Big Bone to the existing system at Richwood will provide a beneficial supply loop for this 100 plus square miles of service territory. The Project will also provide additional feeds to the system to support continued growth in southern Boone and Kenton Counties and will provide system flexibility to back-feed portions of both the UL03 and AM03 segments in the event of scheduled or emergency work.

USE BLOCKS 20-23 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge
Pipeline installation construction activities.

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards:

Type Amount in Cubic Yards	Type Amount in Cubic Yards	Type Amount in Cubic Yards
See Attachment 5	See Attachment 5	See Attachment 5

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)
Acres See Attachment 5
or
Linear Feet See Attachment 5

23. Description of Avoidance, Minimization, and Compensation (see instructions)
See the 'Avoidance and Minimization' Section of the application package cover letter for detailed information.

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24. Is Any Portion of the Work Already Complete? ☐ Yes ☒ No IF YES, DESCRIBE THE COMPLETED WORK

25. Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (if more than can be entered here, please attach a supplemental list)

a. Address- Landowner names and addresses are provided in Attachment 13.

City - State - Zip -

b. Address-

City - State - Zip -

c. Address-

City - State - Zip -

d. Address-

City - State - Zip -

e. Address-

City - State - Zip -

26. List of Other Certificates or Approvals/Denials received from other Federal, State, or Local Agencies for Work Described in This Application.

AGENCY	TYPE APPROVAL*	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED
See Table 2 of the	application cover	letter.			

* Would include but is not restricted to zoning, building, and flood plain permits

27. Application is hereby made for permit or permits to authorize the work described in this application. I certify that this information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

SIGNATURE OF APPLICANT	DATE	SIGNATURE OF AGENT	DATE
STEPHEN R. LANE - DUKE ENERGY	04/18		4-20-16

The Application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than $10,000 or imprisoned not more than five years or both.

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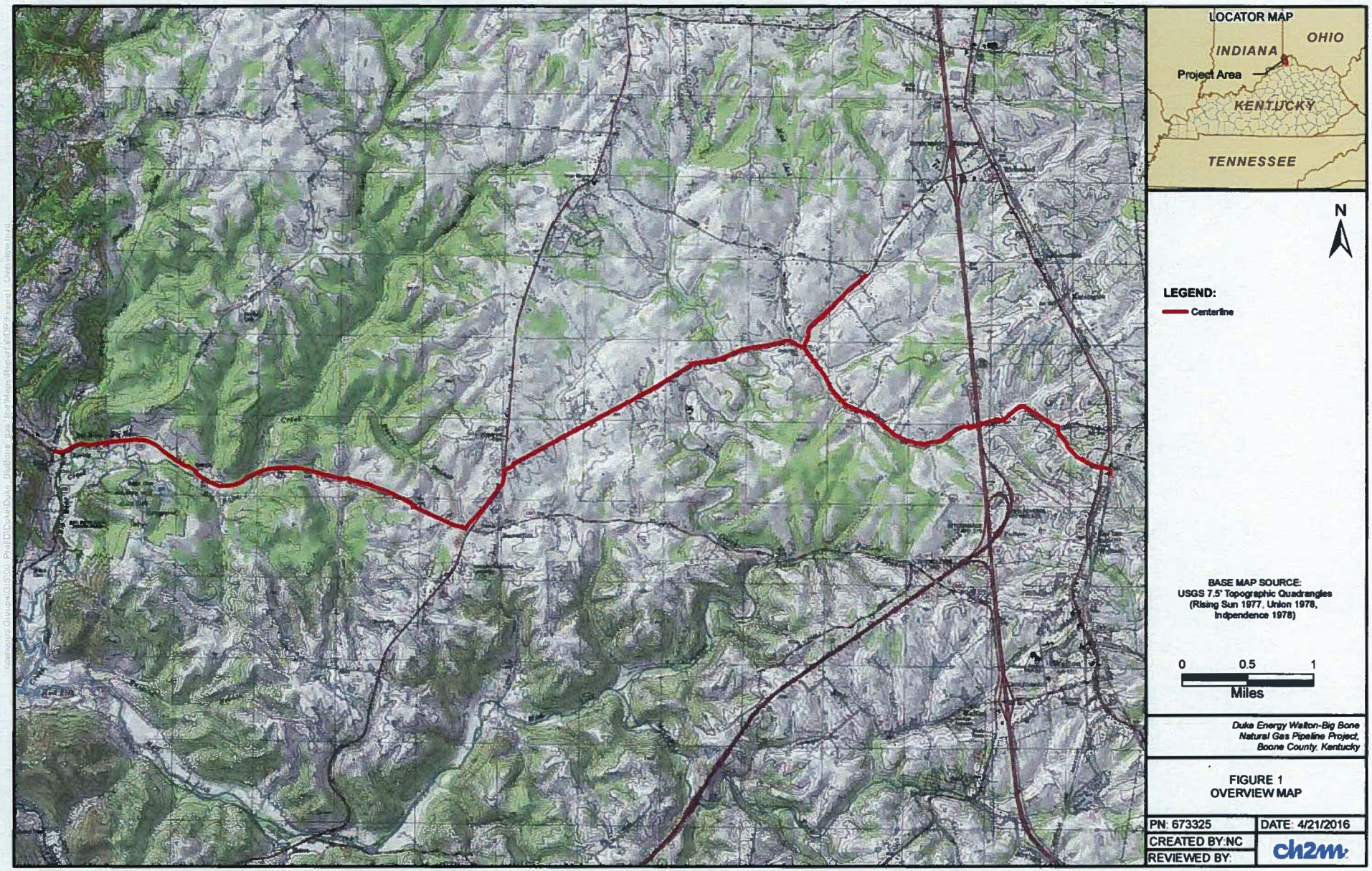

Wetland and Waterbody Delineation Report

Walton-Big Bone Natural Gas Pipeline Project

Boone County, Kentucky

Prepared for

April 2016

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Contents

Acronyms and Abbreviations

CH2M	CH2M HILL Engineers, Inc.
CWA	Clean Water Act
ESRI	Environmental Systems Research Institute
GPS	Global Positioning System
HUC	Hydrologic Unit Code
ID	identification
KDOW	Kentucky Division of Water
NHD	National Hydrography Dataset
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resource Conservation Service
NWI	National Wetland Inventory
OD	outer diameter
OHWM	Ordinary High Water Mark
PAB	palustrine aquatic bed
PEM	palustrine emergent
PFO	palustrine forested
Project	Walton-Big Bone Natural Gas Pipeline Project
PSS	palustrine scrub-shrub
PUB	palustrine unconsolidated bottom
Report	Wetland and Waterbody Delineation Report
TNW	traditionally navigable water
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

SECTION 1

Introduction

This Wetland and Waterbody Delineation Report (Report) summarizes the results of the wetland and waterbody delineation surveys conducted from March 29, 2016 to April 1, 2016, in Boone County, Kentucky by CH2M HILL Engineers, Inc. (CH2M) for the Duke Energy, LLC (Duke) Walton-Big Bone Natural Gas Pipeline Project (Project). A secondary field visit was also conducted on April 19, 2016 to investigate a short re-route. These wetland and waterbody delineation surveys were conducted to supplement previous surveys completed by GAI Consultants, Inc. (GAI) in October 2015. Information collected by GAI is also included in this report.

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 (mostly on private land) immediately adjacent to road right-of-way (ROW) easement with some sections also within 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.

Figures and datasheets from the wetland and waterbody delineation survey are provided as attachments to this report.

- Figure 1 provides an overview map of the environmental survey corridor.
- Figure 2 provides the U.S. Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) mapped soil units.
- Figure 3 provides National Hydrography Dataset (NHD) and National Wetland Inventory (NWI) information.
- Figure 4 provides Wetland and Waterbody Delineation Maps.
- U.S. Army Corps of Engineers (USACE) wetland determination data forms for each identified wetland and representative upland areas are provided in Appendix A.
- Rapid Bioassessment Protocol data forms for each stream identified within the environmental survey corridor are provided as Appendix B.
- Appendix C provides CH2M HILL Open Water/Pond datasheets for each open water feature identified within the environmental survey corridor.
- Field photographs of representative wetlands and waterbodies are provided in Appendix D.
- A preliminary wetland and waterbody delineation report for field investigations performed by GAI in October 2015 is also provided in Appendix E.

SECTION 2

Wetland and Waterbody Delineation

This section describes the Project environmental survey corridor and methodology used during the wetland and waterbody delineation field surveys.

2.1 Environmental Survey Corridor

The environmental survey corridor consisted of a 60-foot wide survey corridor across the 10.3-mile proposed pipeline route. No staging areas or access roads were assessed as part of the field investigations. Duke has communicated that access will be from existing roadways or from within the easement. Staging areas have not yet been determined for the Project but are not expected to impact any streams or wetlands.

The Project area is located within the Kentucky Bluegrass Major Land Resource Area (MLRA) (USDA, 2006). The Kentucky Bluegrass region is characterized by moderately rolling terrain and elevations between 600 and 980 feet above sea level. The geology of the area is characterized by Ordovician-age limestone that has been brought to the surface causes caves and karst topography (USDA, 2006). The soils in this region are generally of a loamy to clayey texture, well drained and range from shallow to very deep.

The Project is entirely within the Middle Ohio-Laughery 8-digit Hydrologic Unit Code (HUC 05090203) (USEPA, 2016).

Land use within the environmental survey corridor comprises residential properties, agricultural fields, pasture, old field, upland forest, palustrine emergent (PEM) wetland, palustrine scrub-shrub (PSS) wetland, and palustrine forested wetland (PFO), in addition to the identified waterbodies.

2.1.1 Annual Precipitation

Monthly rainfall data for Cincinnati, Ohio was obtained from the National Oceanic and Atmospheric Administration (NOAA). Precipitation recorded in Cincinnati, Ohio was above normal from April to December of 2015. In 2016, February and March had higher than average precipitation while January had below average precipitation (Table 2-1; NOAA, 1981-2010; NOAA, 2015-2016).

TABLE 2-1
Precipitation in Cincinnati, Ohio
Walton-Big Bone Natural Gas Pipeline Project

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
					2015							
Monthly Sum [1, 3]	-	-	-	5.13	1.63	7.33	5.04	2.61	2.02	4.31	4.25	6.09
					2016							
Monthly Sum [1, 3]	1.39	5.24	5.30	-	-	-	-	-	-	-	-	-
					Historic							
Normals [2, 3]	3.00	2.81	3.96	3.89	4.93	4.03	3.76	3.41	2.63	3.30	3.43	3.37

[1]NOAA Monthly Weather Summary 2015 and 2016 (Cincinnati, OH)
[2]NOAA 1981-2010 (Cincinnati, OH)
[3]Displayed in inches

2.1.2 Traditional Navigable Waters

The U.S. Environmental Protection Agency (USEPA) and USACE assert jurisdiction over "all waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce including all waters which are subject to the ebb and flow of the tide" (USACE and USEPA, 2008). These

waters are considered traditional navigable waters (TNW). The Ohio River, located approximately 1.8 miles east of the Project survey corridor, is considered to be a TNW (USACE, 2012).

2.1.3 Physiographic Setting

The Project study area is located within the Interior Plateau, Outer Bluegrass Section (71d) (Woods, 2002). This ecoregion is characterized by rolling to hilly uplands with springs ravines and gorges near the Ohio River. Streams in this ecoregion are typically deeply entrenched, and headwater streams can have high gradients. Most streams in this region are ephemeral or intermittent. The dominant vegetation is oak-hickory forests. Abandoned agricultural fields in this area typically are composed of broomsedge (*Andropogon virginicus*) and sumac (*Rhus* spp.) while later successional stages can give rise to black locust and red cedar.

2.2 Field Surveys

Wetland boundaries were field-delineated according to Section 404 of the Clean Water Act (CWA), the routine onsite methodology described in the Technical Report Y-87-1 *Corps of Engineers' Wetlands Delineation Manual* and subsequent guidance documents (USACE, 1987), and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont (Version 2.0)* (USACE, 2012b).

2.2.1 Environmental Survey Corridor

The environmental survey corridor consists of a 60-foot wide survey corridor across the 10.3-mile pipeline in addition to two proposed metering station locations, each 50 ft. x 50 ft.

2.2.2 Background Information

Prior to conducting the field investigations, CH2M reviewed the following resources to identify the potential extent of wetlands and waterbodies within the environmental survey corridor:

- Aerial photo-based maps (ESRI – Microsoft, 2014)
- USGS topographic maps (USGS, 1977; USGS, 1978a and USGS, 1978b)
- NRCS Web Soil Survey (NRCS, 2013)
- NWI maps (USFWS, obtained 2016)
- National Hydrography Dataset (USDA-NRCS, USGS, and USEPA, 2016)

Review of the USGS topographic maps and NHD database indicates the environmental survey corridor crosses three named streams: Big Bone Creek, Beaver Branch, and Mud Lick Creek (Figures 1 and 3).

According to the NRCS soil survey of Boone County (NRCS, 2013), 22 soil map units in addition to water are crossed by the environmental survey corridor (Figure 2). None of the soil map units crossed by the project are listed as hydric (USDA, 2015).

The NWI data (USFWS, 2016) identifies the type of wetland or open water present at a location using the U.S. Fish and Wildlife Service (USFWS) classification system (Cowardin et al., 1979). The NWI data indicates that portions of three palustrine unconsolidated bottom (PUB) feature, and one palustrine forested/shrub wetland (PFO) are within the environmental survey corridor (Figure 3; USFWS, 2016). Caution should be exercised when using NWI maps as the information is obtained largely from aerial interpretation, may be dated, and is only sporadically field checked. The presence of an NWI feature is not a definitive indicator that a wetland or waterbody is present.

The list below outlines the mapped NWI wetlands, including whether these mapped features were verified during the field survey.

- Two PUBHh (Palustrine, Unconsolidated Bottom, Permanently Flooded, Diked/Impounded) features were identified on the NWI maps as being located within the environmental survey corridor. One of these features was not verified. There was a waterbody (S023) identified within the NWI mapped

feature but the surrounding area consisted of upland vegetation (Figure 3G). The second and third NWI features were field verified as a PEM wetland (W013) (Figure 3T) and a pond (P002) (Figure 3I), respectively.

- PFO1A (Palustrine, Forested, Broad-Leaved Deciduous, Temporary Flooded) feature was identified on the NWI map as being located within the environmental survey corridor. A portion of this NWI mapped feature was verified as W003 (Figure 3C).

2.2.3 Field Survey Methodology

CH2M HILL conducted wetland and waterbody delineation surveys within the environmental survey corridor from March 29, 2016 to April 1, 2016 in accordance with the USACE protocols outlined in Section 2.2.

The outer boundaries of each wetland and waterbody within the Project area were delineated and recorded using handheld global positioning system (GPS) units. For waterbodies identified within the Project area, the ordinary high water mark (OHWM) was used as the jurisdictional boundary. As wetland and waterbody features were collected, they were each assigned a unique feature identification (ID). Each feature collected received a unique feature identifier of DNNN, as outlined below. When data point features were associated with wetlands or their associated upland data points, comments were recorded on the data sheets.

D = Data Type (W for Wetland; S for Stream; P for Pond; and DP for Data Point)

NNN = Feature Number (for each feature of a specific LD combination)

According to recent guidance from the USEPA and USACE, wetlands that are adjacent to or have a significant nexus to TNWs are regulated under Sections 401 and 404 of the CWA (USEPA and USACE, 2008). A significant nexus must meet criteria that indicate that the wetland provides biological, physical, or chemical benefits to the TNW. A significant nexus includes consideration of both hydrologic and ecologic factors. USEPA and USACE have recently proposed a new rule to further clarify whether a waterbody would fall under the jurisdiction of Waters of the United States. They have proposed that tributaries, which have a bed, bank and high water mark, will be considered jurisdictional. They have also included areas that are within the floodplain as well as riparian areas (USEPA and USACE, 2014). The Ohio River is the closest TNW downstream of the Project area. Named streams in the Project area are tributaries to the Ohio River.

Jurisdictional streams were identified as those waters that possessed a defined "bed and bank" or OHWM indicators and lacked a dominance of upland vegetation in the channel. Channels that parallel a roadway or railroad were identified as upland drainage features and were not considered to be jurisdictional unless they had an identifiable OHWM, were identified on the USGS topographic map, or represented a presumed relocation of a natural channel.

The Kentucky Department of Water (KDOW) also requires classification of perennial and intermittent streams, if present, in accordance with the KDOW *Methods for Assessing Habitat in Wadeable Waters* (KDOW, 2011). With this Rapid Bioasssessment Protocol (RBP), streams are classified as either high gradient or low gradient. High gradient streams have a velocity greater than 0.5 feet/second, have high frequency of riffle habitat and exhibit rapid changes in stream gradient. Low gradient streams have velocities less than 0.5 feet/second and lack riffle habitat. The streams are scored using either the high or low gradient data forms.

The quality of the stream is then determined based on the total score (Table 2-2).

TABLE 2-2
Narrative scoring guide for Rapid Bioassessment quantitative scores

Bioregion	Rating	Area Scoring	
		Headwater (<5.0 mi²)	Wadeable (>5.0 mi²)
Bluegrass	Good	≥ 156	≥ 130
	Fair	142-155	114-129
	Poor	≤ 141	≤ 113

SECTION 3

Field Survey Results

A total of 11 wetlands, 68 streams, and one pond were delineated within the environmental survey corridor by CH2M and GAI. The features identified within the survey corridor are displayed and identified on the Wetlands and Waterbodies Delineation Maps (Figure 4), and Tables 3-1 and 3-2.

3.1 Wetland and Waterbody Summary

A summary of wetland and waterbody characteristics within the environmental survey corridor is provided in Tables 3-1 and 3-2. Area (acres) of wetlands and ponds, and length (feet) of streams within the environmental survey corridor is included; however, it is noted that these features or portions of these features may not be impacted by Project construction.

3.1.1 Wetlands

Eleven wetlands were delineated within the environmental survey corridor. Nine of the identified wetlands were considered to be PEM wetlands based on Cowardin Classification (1979). One wetland was considered to be PSS, and the remaining wetland consisted of a combination of PFO, PSS and PEM vegetation. This wetland is broken up by vegetation class in the descriptions below. Wetlands identified appear to be hydrologically connected to surface waters that are tributaries to the Mud Lick Creek or Big Bone Creek, which flow into the Ohio River, and therefore will likely be considered jurisdictional by the USACE. It is noted that the USACE and KDOW make the final determination of wetland hydrologic connectivity.

Nine representative upland data points were recorded during the wetland delineation to determine the presence/absence of wetlands and/or document upland conditions within the environmental survey corridor. These data points were determined not to be wetlands because they did not have positive indicators of one or more of the three wetland criteria: hydrophytic vegetation, wetland hydrology, and hydric soils.

Table 3-1 provides additional information regarding wetlands identified within the environmental survey corridor, and the wetland data forms are included in Appendix A.

3.1.2 PEM Wetlands

The ten PEM wetlands appeared to be seasonally or periodically inundated and hydrology indicators identified included the presence of surface water, high water table, saturation, and oxidized rhisospheres. Dominant vegetation within the PEM wetlands included yellow nutsegde (*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 sagittata*), lesser 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*).

3.1.3 PSS Wetlands

Overall, the two PSS wetlands appeared seasonally or periodically inundated, and hydrology indicators identified included the presence of surface water, high water table, saturation, and oxidized rhisospheres. These wetlands were dominated by 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*).

3.1.4 PFO Wetland

The one PFO wetland identified appeared to be seasonally saturated and hydrology indicators observed included the presence of saturation and stunted and stressed plants. This wetland was dominated ash-leaf maple, eastern cottonwood, creeping-jenny, and spearmint (*Mentha spicata*).

3.1.5 Waterbodies

A total of 68 streams were identified within the environmental survey corridor for the Project. Nineteen streams are classified as perennial, 15 as intermittent, and 34 as ephemeral. Of the 34 ephemeral streams, eight were considered to be roadside drainages. One stream (SKY-CDK-018) is crossed twice along the environmental survey corridor. Flow regime determinations were interpreted based on field observations and the USGS topographic maps (Table 3-2).

USGS-mapped streams in the Project area include Big Bone Creek, Beaver Branch and Mud Lick Creek as well as unnamed tributaries to these three streams. Streams identified within the environmental survey corridor appear to have a continuous surface connection to a TNW and are therefore likely to be considered jurisdictional by the USACE. It is noted that the USACE and KDOW make the final determination of significant nexus with a TNW.

Streams were evaluated as high gradient streams according to KDOW *Methods for Assessing Habitat in Wadeable Waters*, due to the steep slope of the streambeds.

Table 3-2 provides additional information regarding waterbodies identified within the environmental survey corridor, and the waterbody data forms are provided in Appendix B.

3.1.6 Ponds

One pond was identified within the environmental survey corridor. The identified pond is assumed to be jurisdictional. Approximately 0.02 acre of P001 is located within the environmental study corridor.

SECTION 4

Conclusion

Duke Energy is proposing the construction of the Walton-Big Bone Natural Gas Pipeline Project. The Project is located in Boone County, Kentucky. This Report summarizes the results of field surveys associated with portions of the Project conducted by CH2M HILL from March 29, 2016 to April 1, 2016. Previous surveys were conducted by GAI in October 2015. GAI identified 26 streams within the environmental survey corridor. A total of 11 wetlands, 68 stream crossings, and one pond were delineated, by both CH2M and GAI, within the environmental survey corridor.

SECTION 5

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Tables

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TABLE 3-1
Project Study Area Stream Summary
Walton-Big Bone Natural Gas Pipeline Project

Feature ID	Figure Sheet Number[1]	12-Digit HUC	HUC Name	NWI Classification	Field-Identified Cowardin Classification	Area Delineated within the Environmental Survey Corridor (acres)[2]	Hydrologic Connection[3]
W003	D / E	050902031003	Big Bone Creek	-	PEM	<0.01	Adjacent/Connected
W003	D / E	050902031003	Big Bone Creek	-	PSS	<0.01	Adjacent/Connected
W003	D / E	050902031003	Big Bone Creek	PFO1A	PFO	<0.01	Abutting S004
W004	H	050902031003	Big Bone Creek	-	PEM	0.02	Adjacent/Connected
W005	I	050902031003	Big Bone Creek	-	PEM	0.01	Abutting S014
W006	I	050902031003	Big Bone Creek	-	PEM	0.01	Adjacent/Connected
W007	N	050902031003	Big Bone Creek	-	PEM	0.03	Abutting S025
W008	O	050902031003	Big Bone Creek	-	PEM	0.09	Abutting SKY-CDK-015
W009	AF	050902031001	Mud Lick Creek	-	PSS	0.08	Abutting SKY-CDK-022
W010	AI	050902031001	Mud Lick Creek	-	PEM	0.02	Abutting S039
W011	AI	050902031001	Mud Lick Creek	-	PEM	0.05	Adjacent/Connected
W012	AJ	050902031001	Mud Lick Creek	-	PEM	0.06	Abutting SKY-CDK-025
W013	AM	050902031001	Mud Lick Creek	PUBHh	PEM	0.06	Abutting S044
TOTAL	-	-	-	-	-	**0.43**	-

Abbreviations:

HUC	hydrologic unit code
ID	identification
NA	not applicable
PEM	palustrine emergent
PSS	palustrine scrub shrub
PFO	palustrine forested

NOTES:

[1]Corresponds to location in Figure 4 series.

[2]Wetland may extend outside of the environmental survey corridor; this acreage corresponds to the size of the feature located within the environmental survey corridor.

[3]The determination of hydrologic connection is based on the boundary delineations and have not been formally approved by the USACE and/or KDOW.

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TABLE 3-2
Project Study Area Stream Summary
Walton-Big Bone Natural Gas Pipeline Project

Feature ID	Figure Sheet Number[1]	12-Digit HUC	HUC Name	Waterbody Name	Flow Regime[2]	RPW or Non-RPW[3]	RBP Score	Narrative Rating	Average OHWM Width (feet)[4]	Approximate Length Delineated within the Environmental Survey Corridor (feet)	TNW Connection	Delineated By
SKY-CDK-009	A	050902031003	Big Bone Creek	UNT to Gum Branch	Ephemeral roadside drainage	non-RPW	-	-	0.3	295	Ohio River	GAI
SKY-CDK-010	A	050902031003	Big Bone Creek	UNT to Gum Branch	Perennial	RPW	80	Poor	5	61	Ohio River	GAI
SKY-CDK-008	A	050902031003	Big Bone Creek	Gum Branch	Perennial	RPW	94	Poor	20	65	Ohio River	GAI
S001	B	050902031003	Big Bone Creek	UNT to Big Bone Creek	Intermittent	RPW	102	Poor	3.5	63	Ohio River	CH2M
SKY-CDK-011	C	050902031003	Big Bone Creek	UNT to Big Bone Creek	Intermittent	RPW	80	Poor	7	60	Ohio River	GAI
S002	D	050902031003	Big Bone Creek	UNT to Big Bone Creek	Ephemeral roadside drainage	non-RPW	-	-	2	38	Ohio River	CH2M
S003	D	050902031003	Big Bone Creek	UNT to Big Bone Creek	Intermittent	RPW	126	Poor	3	60	Ohio River	CH2M
S004	D	050902031003	Big Bone Creek	UNT to Big Bone Creek	Intermittent	RPW	103	Poor	4	60	Ohio River	CH2M
S005	E	050902031003	Big Bone Creek	UNT to Big Bone Creek	Intermittent	RPW	113	Poor	4	64	Ohio River	CH2M
S006	E	050902031003	Big Bone Creek	UNT to Big Bone Creek	Ephemeral roadside drainage	non-RPW	-	-	1	45	Ohio River	CH2M
S007	E	050902031003	Big Bone Creek	UNT to Big Bone Creek	Ephemeral	non-RPW	-	-	1	22	Ohio River	CH2M
SKY-CDK-007	F	050902031003	Big Bone Creek	UNT to Big Bone Creek	Perennial	RPW	88	Poor	8	60	Ohio River	GAI
S008	F	050902031003	Big Bone Creek	UNT to Big Bone Creek	Intermittent	RPW	89	Poor	3	64	Ohio River	CH2M
S009	G	050902031003	Big Bone Creek	UNT to Big Bone Creek	Intermittent	RPW	51	Poor	2	19	Ohio River	CH2M
S010	G	050902031003	Big Bone Creek	UNT to Big Bone Creek	Ephemeral roadside drainage	non-RPW	-	-	1	135	Ohio River	CH2M
SKY-CDK-006	G	050902031003	Big Bone Creek	Big Bone Creek	Perennial	RPW	118	Poor	50	93	Ohio River	GAI
S011	H	050902031003	Big Bone Creek	UNT to Big Bone Creek	Ephemeral	non-RPW	-	-	3	127	Ohio River	CH2M
S012	I	050902031003	Big Bone Creek	UNT to Big Bone Creek	Intermittent	RPW	97	Poor	2	20	Ohio River	CH2M
S013	H	050902031003	Big Bone Creek	UNT to Big Bone Creek	Ephemeral	non-RPW	-	-	3	21	Ohio River	CH2M
S016	J	050902031003	Big Bone Creek	UNT to Big Bone Creek	Ephemeral	non-RPW	-	-	2	50	Ohio River	CH2M
S017	J	050902031003	Big Bone Creek	UNT to Big Bone Creek	Perennial	RPW	125	Poor	8	82	Ohio River	CH2M
SKY-CDK-005	J	050902031003	Big Bone Creek	UNT to Big Bone Creek	Ephemeral roadside drainage	non-RPW	-	-	4	91	Ohio River	GAI
S018	K	050902031003	Big Bone Creek	UNT to Big Bone Creek	Ephemeral	non-RPW	-	-	2	20	Ohio River	CH2M
S019	K	050902031003	Big Bone Creek	UNT to Big Bone Creek	Ephemeral	non-RPW	-	-	1	21	Ohio River	CH2M
SKY-CDK-004	K	050902031003	Big Bone Creek	UNT to Big Bone Creek	Ephemeral	non-RPW	-	-	3	80	Ohio River	GAI
S022	K	050902031003	Big Bone Creek	UNT to Big Bone Creek	Ephemeral	non-RPW	-	-	1	33	Ohio River	CH2M
S020	L	050902031003	Big Bone Creek	UNT to Big Bone Creek	Ephemeral	non-RPW	-	-	1	55	Ohio River	CH2M
S021	L	050902031003	Big Bone Creek	UNT to Big Bone Creek	Ephemeral	non-RPW	-	-	2	58	Ohio River	CH2M
SKY-CDK-001	L	050902031003	Big Bone Creek	UNT to Big Bone Creek	Ephemeral	non-RPW	-	-	1.5	71	Ohio River	GAI
S023	M	050902031003	Big Bone Creek	UNT to Beaver Branch	Perennial	RPW	89	Poor	3	53	Ohio River	CH2M
SKY-CDK-012	N	050902031003	Big Bone Creek	Beaver Branch	Perennial	RPW	91	Poor	7	98	Ohio River	GAI
S024	N	050902031003	Big Bone Creek	UNT to Beaver Branch	Ephemeral roadside drainage	non-RPW	-	-	1	138	Ohio River	CH2M
SKY-CDK-012a	N	050902031003	Big Bone Creek	Beaver Branch	Perennial	RPW	NA	-	2	14	Ohio River	GAI
S025	N	050902031003	Big Bone Creek	UNT to Beaver Branch	Intermittent (part ephemeral roadside)	RPW	69	Poor	3	404	Ohio River	CH2M
S026	N	050902031003	Big Bone Creek	UNT to Beaver Branch	Ephemeral	non-RPW	-	-	1	21	Ohio River	CH2M
S027	N	050902031003	Big Bone Creek	UNT to Beaver Branch	Ephemeral	non-RPW	-	-	1	24	Ohio River	CH2M
S028	O	050902031003	Big Bone Creek	UNT to Beaver Branch	Perennial	RPW	102	Poor	9	61	Ohio River	CH2M
S029	O	050902031003	Big Bone Creek	UNT to Beaver Branch	Ephemeral	non-RPW	-	-	2	36	Ohio River	CH2M
S030	O	050902031003	Big Bone Creek	UNT to Beaver Branch	Ephemeral	non-RPW	-	-	1	29	Ohio River	CH2M
SKY-CDK-015	O	050902031003	Big Bone Creek	UNT to Beaver Branch	Intermittent	RPW	NA	-	3	113	Ohio River	GAI
S031	Q	050902031003	Big Bone Creek	UNT to Beaver Branch	Intermittent	RPW	62	Poor	5	152	Ohio River	CH2M
S032	Q	050902031001	Mud Lick Creek	UNT to Mud Lick Creek	Ephemeral	non-RPW	-	-	2	33	Ohio River	CH2M
SKY-CDK-016	S	050902031001	Mud Lick Creek	UNT to Mud Lick Creek	Perennial	RPW	65	Poor	10	65	Ohio River	GAI
SKY-CDK-014	W	050902031001	Mud Lick Creek	UNT to Mud Lick Creek	Perennial	RPW	NA	-	5	25	Ohio River	GAI
S033	W	050902031001	Mud Lick Creek	UNT to Mud Lick Creek	Intermittent	RPW	90	Poor	6	28	Ohio River	CH2M
S034	W	050902031001	Mud Lick Creek	UNT to Mud Lick Creek	Ephemeral roadside drainage	non-RPW	-	-	2	173	Ohio River	CH2M
SKY-CDK-013	Y	050902031001	Mud Lick Creek	UNT to Mud Lick Creek	Perennial	RPW	104	Poor	13	60	Ohio River	GAI
SKY-CDK-017	AB	050902031001	Mud Lick Creek	Mud Lick Creek	Perennial	RPW	83	Poor	10	64	Ohio River	GAI
SKY-CDK-018	AB	050902031001	Mud Lick Creek	UNT to Mud Lick Creek	Perennial	RPW	83	Poor	10	195	Ohio River	GAI
SKY-CDK-018	AB	050902031001	Mud Lick Creek	UNT to Mud Lick Creek	Perennial	RPW	83	Poor	12	68	Ohio River	GAI
SKY-CDK-020	AD	050902031001	Mud Lick Creek	UNT to Mud Lick Creek	Perennial	RPW	89	Poor	6	61	Ohio River	GAI
SKY-CDK-021	AE	050902031001	Mud Lick Creek	UNT to Mud Lick Creek	Ephemeral	non-RPW	-	-	3	64	Ohio River	GAI
SKY-CDK-022	AF	050902031001	Mud Lick Creek	UNT to Mud Lick Creek	Perennial	RPW	84	Poor	8	66	Ohio River	GAI

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TABLE 3-2
Project Study Area Stream Summary
Walton-Big Bone Natural Gas Pipeline Project

Feature ID	Figure Sheet Number[1]	12-Digit HUC	HUC Name	Waterbody Name	Flow Regime[2]	RPW or Non-RPW[3]	RBP Score	Narrative Rating	Average OHWM Width (feet)[4]	Approximate Length Delineated within the Environmental Survey Corridor (feet)	TNW Connection	Delineated By
SKY-CDK-023	AH	050902031001	Mud Lick Creek	UNT to Mud Lick Creek	Ephemeral	non-RPW	-	-	1	61	Ohio River	GAI
S038	AI	050902031001	Mud Lick Creek	UNT to Mud Lick Creek	Ephemeral roadside drainage	non-RPW	-	-	1.5	139	Ohio River	CH2M
SKY-CDK-024	AJ	050902031001	Mud Lick Creek	UNT to Mud Lick Creek	Intermittent	RPW	NA	-	6	57	Ohio River	GAI
SKY-CDK-025	AJ	050902031001	Mud Lick Creek	UNT to Mud Lick Creek	Ephemeral	non-RPW	-	-	4	58	Ohio River	GAI
SKY-CDK-026	AJ	050902031001	Mud Lick Creek	UNT to Mud Lick Creek	Perennial	RPW	58	Poor	6	50	Ohio River	GAI
SKY-CDK-027	AJ	050902031001	Mud Lick Creek	UNT to Mud Lick Creek	Perennial	RPW	49	Poor	5	74	Ohio River	GAI
S044	AM	050902031001	Mud Lick Creek	UNT to Mud Lick Creek	Perennial	RPW	101	Poor	2	135	Ohio River	CH2M
S045	AM	050902031001	Mud Lick Creek	UNT to Mud Lick Creek	Ephemeral	non-RPW	-	-	1	66	Ohio River	CH2M
S046	AM	050902031001	Mud Lick Creek	UNT to Mud Lick Creek	Intermittent	RPW	113	Poor	1	70	Ohio River	CH2M
S040	AN	050902031001	Mud Lick Creek	UNT to Mud Lick Creek	Ephemeral	non-RPW	-	-	1	1	Ohio River	CH2M
S041	AN	050902031001	Mud Lick Creek	UNT to Mud Lick Creek	Ephemeral	non-RPW	-	-	1	20	Ohio River	CH2M
S042	AN	050902031001	Mud Lick Creek	UNT to Mud Lick Creek	Ephemeral	non-RPW	-	-	1	6	Ohio River	CH2M
S035	AQ	050902031001	Mud Lick Creek	UNT to Mud Lick Creek	Ephemeral	non-RPW	-	-	1	60	Ohio River	CH2M
S036	AQ	050902031001	Mud Lick Creek	UNT to Mud Lick Creek	Ephemeral	non-RPW	-	-	1	20	Ohio River	CH2M
S037	AR	050902031001	Mud Lick Creek	UNT to Mud Lick Creek	Intermittent	RPW	64	Poor	2	56	Ohio River	CH2M
SKY-CDK-019	AS	050902031001	Mud Lick Creek	UNT to Mud Lick Creek	Ephemeral	non-RPW	-	-	3	80	Ohio River	GAI
TOTAL	-	-	-	-	-	-	-	-	-	4,714	-	-

Abbreviations:

HUC	hydrologic unit code
ID	identification
OHWM	ordinary high water mark
non-RPW	non-relatively permanent water
RBP	rapid bioassessment protocol
RPW	relatively permanent water
TNW	traditional navigable water
NA	RBP forms for these streams were not provided by GAI

NOTES:
[1]Corresponds to location in Figure 4 series.
[2]Flow regime is defined as perennial, intermittent, or ephemeral. This determination was interpreted using field observations and USGS topographic maps, as appropriate.
[3]Intermittent and perennial streams were recorded as RPWs; ephemeral streams were recorded as non-RPWs.
[4]Based on field observations

Figures

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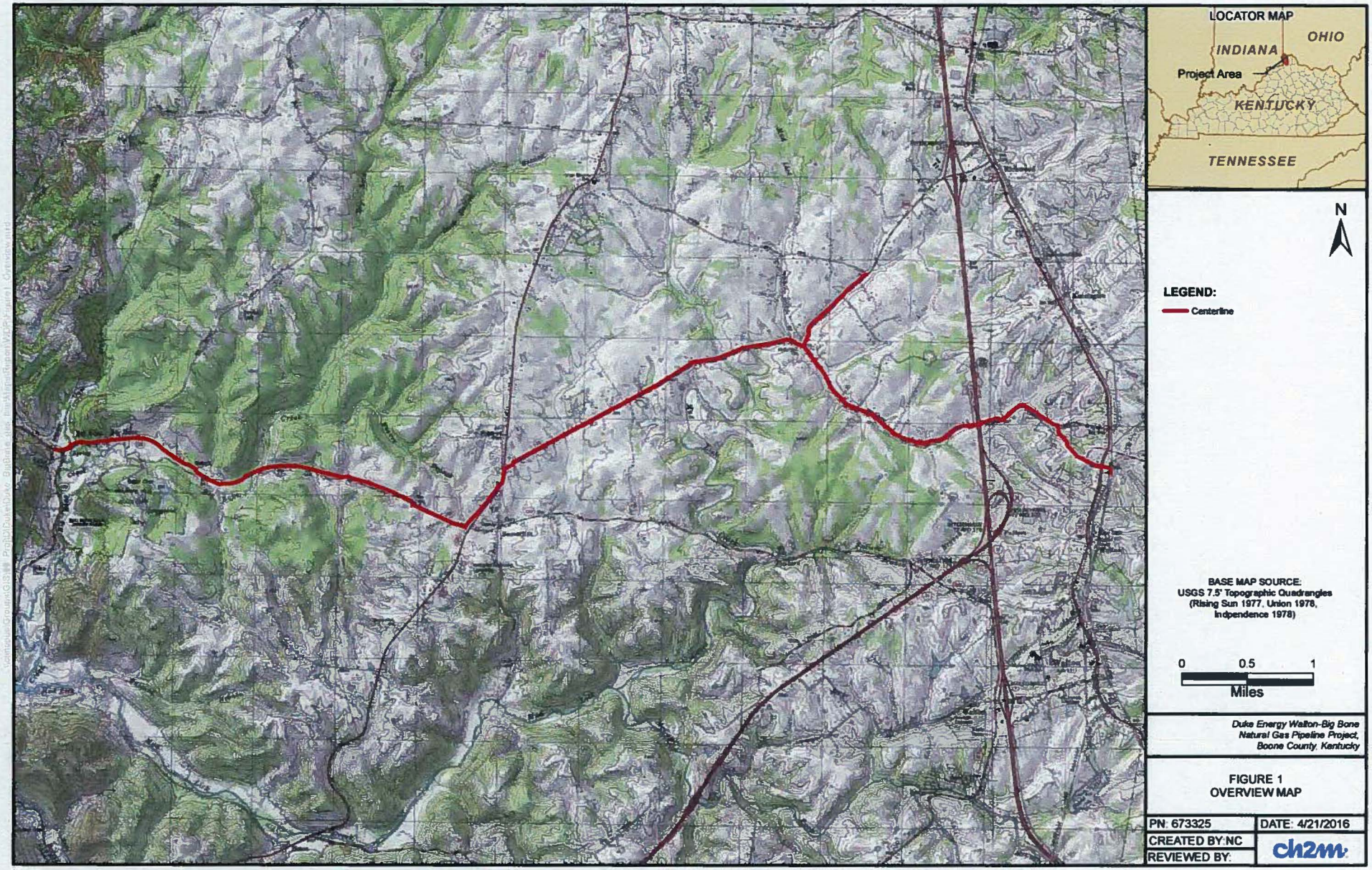

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N

LEGEND:

- Centerline
- Mapped Soil Units
- Right of Way
- Study Area

Note: The LOD will be restricted to a 30-foot width at stream and wetland crossings.

BASE MAP SOURCE:
ESRI World Imagery 2014

SPATIAL DATA SOURCE:
Soils - USDA, NRCS 2013

0 200 400
Scale In Feet

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

FIGURE NUMBER 2A
SOILS MAP

PN: 673325	DATE: 4/21/2016
CREATED BY:NC	ch2m
REVIEWED BY:	

CONFIDENTIAL PROPRIETARY TRADE SECRET

N

LEGEND:

- Centerline
- Mapped Soil Units
- Right of Way
- Study Area

Note: The LOD will be restricted to a 30-foot width at stream and wetland crossings.

BASE MAP SOURCE:
ESRI World Imagery 2014

SPATIAL DATA SOURCE:
Soils - USDA, NRCS 2013

0 200 400
Scale In Feet

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

FIGURE NUMBER 2B
SOILS MAP

PN: 673325	DATE: 4/21/2016
CREATED BY: NC	ch2m
REVIEWED BY:	

CONFIDENTIAL PROPRIETARY TRADE SECRET

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

FIGURE NUMBER 2C
SOILS MAP

PN: 673325	DATE: 4/21/2016
CREATED BY:NC	ch2m
REVIEWED BY:	

CONFIDENTIAL PROPRIETARY TRADE SECRET

LEGEND:

- Centerline
- Mapped Soil Units
- Right of Way
- Study Area

Note: The LOD will be restricted to a 30-foot width at stream and wetland crossings.

BASE MAP SOURCE:
ESRI World Imagery 2014

SPATIAL DATA SOURCE:
Soils - USDA, NRCS 2013

0 200 400
Scale In Feet

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

FIGURE NUMBER 2D
SOILS MAP

PN: 673325	DATE: 4/21/2016
CREATED BY:NC	ch2m
REVIEWED BY:	

CONFIDENTIAL PROPRIETARY TRADE SECRET

N

LEGEND:

- Centerline
- Mapped Soil Units
- Right of Way
- Study Area

Note: The LOD will be restricted to a 30-foot width at stream and wetland crossings.

BASE MAP SOURCE:
ESRI World Imagery 2014

SPATIAL DATA SOURCE:
Soils - USDA, NRCS 2013

0 200 400
Scale In Feet

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

FIGURE NUMBER 2E
SOILS MAP

PN: 673325	DATE: 4/21/2016
CREATED BY:NC	ch2m
REVIEWED BY:	

CONFIDENTIAL PROPRIETARY TRADE SECRET

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N

LEGEND:

- Centerline
- Mapped Soil Units
- Right of Way
- Study Area

Note: The LOD will be restricted to a 30-foot width at stream and wetland crossings.

BASE MAP SOURCE:
ESRI World Imagery 2014

SPATIAL DATA SOURCE:
Soils - USDA, NRCS 2013

0 200 400
Scale In Feet

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

FIGURE NUMBER 2G
SOILS MAP

PN: 673325	DATE: 4/21/2016
CREATED BY:NC	ch2m
REVIEWED BY:	

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N

LEGEND:

- Centerline
- Mapped Soil Units
- Right of Way
- Study Area

Note: The LOD will be restricted to a 30-foot width at stream and wetland crossings.

BASE MAP SOURCE:
ESRI World Imagery 2014

SPATIAL DATA SOURCE:
Soils - USDA, NRCS 2013

0 200 400
Scale In Feet

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

FIGURE NUMBER 2I
SOILS MAP

PN: 673325	DATE: 4/21/2016
CREATED BY:NC	ch2m
REVIEWED BY:	