

LETTER OF NOTIFICATION

NTE Middletown Energy Center Electrical Interconnection

Ohio Power Siting Board Case No. 14-2314-EL-BLN

December 2014

Prepared for:



NTE ENERGY

NTE Ohio, LLC

24 Cathedral Place, Suite 300

Saint Augustine, FL 32084

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Prepared by:



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Letter of Notification
NTE Ohio, LLC – Electrical Interconnection
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ACRONYMS AND ABBREVIATIONS

Duke	Duke Energy Ohio
Duke ROW	the existing Duke Transmission Line right-of-way
Duke Transmission Line	existing Duke 345 kV electric transmission line extending between the Todhunter and Foster Substations
the Duke Switchyard	Portion of the NTE Electrical Interconnection, consisting of a new electrical switchyard adjacent to the NTE Switchyard
EMF	electric and magnetic field
the Facility	the NTE Middletown Energy Center, a combined-cycle natural gas turbine electric generating facility
IEEE	Institute of Electrical and Electronics Engineers
kV	kilovolt
kV/m	kilovolt per meter, a measure of electric field strength
mG	milligauss, a measure of magnetic field strength
NRHP	National Register of Historic Places
NTE	NTE Ohio, LLC
NTE Transmission Line Corridor	portion of the NTE Electrical Interconnection, consisting of proposed transmission structures and newly constructed 345-kV line, located between the existing Duke Transmission Line and the NTE Switchyard
NTE Switchyard	collector bus to be located adjacent to the Facility power block
NTE Electrical Interconnection	the NTE Middletown Energy Center Electrical Interconnection, the proposed activity, an interconnecting switchyard and 345-kilovolt electric transmission corridor between the existing Duke electric transmission grid and the NTE Middletown Energy Center facility and switchyard
OAC	Ohio Administrative Code
ODNR	Ohio Department of Natural Resources
OPSB	Ohio Power Siting Board
PJM	the regional electric transmission independent system operator
ROW	right-of-way
USFWS	United States Fish and Wildlife Service

Letter of Notification
NTE Ohio, LLC – Electrical Transmission Facilities

In accordance with Ohio Administrative Code (OAC) Rule 4901-11-01, Letter of Notification, NTE Ohio, LLC (NTE) submits the following information:

4906-11-01 (B) GENERAL INFORMATION

4906-11-01 (B) (1) Project Name and Reference Number

The applicant is NTE Ohio, LLC. The name of this project is the NTE Middletown Energy Center Electrical Interconnection (NTE Electrical Interconnection). The Ohio Power Siting Board (OPSB) Case Number is Case No. 14-2314-EL-BLN.

4906-11-01 (B) (1) Description of the Project

The NTE Electrical Interconnection will interconnect an existing Duke Energy Ohio (Duke) 345-kilovolt (kV) transmission line (Duke Transmission Line) to NTE's proposed state-of-the-art combined-cycle natural gas turbine electric generating facility (the Facility). The NTE Electrical Interconnection consists of a connecting switchyard (the Duke Switchyard) and two proposed transmission taps (the NTE Transmission Line Corridor) to extend to the existing Duke Transmission Line. The Duke Transmission Line traverses the southern portion of the Facility site (please refer to Figures 1 and 2 of Attachment A).

The Facility has been approved in a separate OPSB filing, Case No. 14-534-EL-BGN, which includes the electric generating facility, the Facility switchyard (the NTE Switchyard), and other ancillary equipment. Electrical power will be generated at the Facility at a voltage

level of 21 kV and stepped-up to a voltage level of 345 kV by newly installed transformers located within the Facility power block. Power will then be transmitted via overhead conductor to the Facility's NTE Switchyard to collect outgoing power from each generator circuit and route to a common discharge point; to provide suitable automatic protection and manual isolation between the Facility and the Duke Switchyard; and to provide for revenue metering on the common discharge point.

The Duke Switchyard will receive power from the NTE Switchyard, and will include a three-breaker ring bus for the looping connection with the existing Duke Transmission Line. From the Duke Switchyard, the NTE Transmission Line Corridor will extend to the existing Duke Transmission Line. The NTE Electrical Interconnection will be located entirely within the City of Middletown, Butler County, Ohio. The NTE Electrical Interconnection includes elements of work within property optioned by NTE and within the existing Duke Transmission Line right-of-way (Duke ROW).

The NTE Electrical Interconnection will enhance Facility reliability by providing connections to both the Todhunter and Foster Substations. Proposed activities are all located within the Facility site and Duke ROW, and include (as shown in Attachment A, Figures 1 and 2):

- Construction and operation of the Duke Switchyard, an approximately 300 by 400 foot enclosure including the three-breaker ring bus.
- Construction and operation of two new poles within the existing Duke ROW.

- Construction and operation of interconnecting wires between the Duke Switchyard and the two new poles, and from the two new poles to the existing Duke Transmission Line.

NTE has entered into an option agreement with AK Steel related to the land on which the Facility and NTE Electrical Interconnection will be located. Prior to construction of the Facility and NTE Electrical Interconnection, NTE will execute the necessary documents to finalize the property purchase. NTE will be responsible for construction of the Facility, including the NTE Switchyard, as well as the Duke Switchyard; Duke will be responsible for construction of the NTE Transmission Line Corridor. NTE will transfer an easement on the property on which the Duke Switchyard will be located, as well as an access right-of-way to Duke. In addition, a right-of-way will be granted to Duke that extends 75 feet from the centerline of each proposed new transmission line within the NTE Transmission Line Corridor. The Facility site will remain in NTE ownership. Duke has rights to conduct work within its existing Duke ROW associated with the proposed activities.

4906-11-01(B)(1) Reason the Project Meets Letter of Notification Requirements

The NTE Transmission Interconnection meets the requirements of Ohio Revised Code Section 4906.03 (F)(1)(a)(b) and (c) and OAC Rule 4906-1-01, Appendix A(1)(b) which states that lines 300 kV and above, and greater than 0.1 mile but not greater than two miles in length, require the submittal of a Letter of Notification. An ancillary component, the Duke Switchyard, is also incorporated in this filing and, together, comprise the NTE Electrical Interconnection. The NTE Electrical Interconnection includes construction of the new structures that are solely needed to meet the requirements of a specific customer, the Facility.

4906-11-01(B)(2) Need for the Project

The Facility will generate energy to meet regional demand, and must be connected to the existing transmission grid in order to provide that energy to market. The regional electric transmission independent system operator (PJM) Interconnection System Impact Study was initiated for the Facility in April 2014 and completed on September 29, 2014. The System Impact Study confirmed that the Facility requires a 345-kV line extension to loop from the existing Duke Transmission Line to the Facility in order to generate electricity and supply energy and capacity to the PJM system.

4906-11-01(B)(3) Project Location Relative to Existing and Proposed Lines

The location of the NTE Electrical Interconnection in relation to the existing Duke Transmission Line is shown in Attachment A, Figures 1 and 2.

4906-11-01 (B) (4) Alternatives Considered

The Duke Transmission Line is the closest 345-kV transmission corridor to the Facility, as it traverses the southern portion of the Facility site. PJM's System Impact Study confirmed that the Facility can interconnect to the grid at this location without the need for substantial additional local or network upgrades. The on-going PJM Facility Study is anticipated to confirm that the looping configuration proposed for the NTE Electrical Interconnection meets applicable Duke requirements.

No formal routing study was completed for the NTE Electrical Interconnection due to the location of the connection point on the Facility site and the lack of significant environmental

features, as discussed later in this document. The location of the NTE Electrical Interconnection considered and minimized tree clearing and maximizes distance from other land uses. As further discussed in Section 4906-11-01 (D), the NTE Electrical Interconnection is located entirely within the City of Middletown, Butler County, on an industrially-zoned property. Information regarding the anticipated NTE Electrical Interconnection was shared during public meetings associated with the Facility, and the entire Facility site was evaluated during that Certificate process. Given the lack of specific environmental constraints, the locations of the poles were determined based on their function. The proposed NTE Electrical Interconnection represents the most suitable and least-impact siting and routing alternative considered.

4906-11-01 (B) (5) Anticipated Construction Schedule and In-Service Date

Construction of the NTE Electrical Interconnection is expected to begin in the second quarter of 2015 and is scheduled to be in-service by the third quarter of 2017 (prior to the Facility's in-service date in the second quarter of 2018 to allow for backfeed availability).

4906-11-01 (B) (6) Maps Depicting Project Location

Attachment A, Figure 1 has been prepared at a scale of not less than 1:24,000 feet to show the location of the NTE Electrical Interconnection. The figure includes the proposed location of the Facility and NTE Switchyard, the Duke Switchyard, and the NTE Transmission Line Corridor, as well as clearly marked streets, roads, and highways. As can be seen, the NTE Electrical Interconnection is located in the City of Middletown, Butler County, Ohio, just north of the Monroe town line. The NTE Electrical Interconnection extends from the existing Duke ROW, which

traverses the southern portion of the Facility site, across a portion of the NTE-optioned property to the NTE Switchyard.

To visit the proposed NTE Electrical Interconnection, the following directions can be utilized: From Columbus, take Interstate 70 West to Exit 44A for Interstate 675 South toward Interstate 75 South. Keep left to merge onto Interstate 75 South toward Cincinnati. Take exit 32 for Ohio Route 122 West toward Middletown. Turn left onto S. Dixie Highway for 0.7 mile. Continue on Cincinnati Dayton Road for approximately 2 miles. The location of the NTE Electrical Interconnection will be to the west of Cincinnati Dayton Road, north of the intersection between Cincinnati Dayton Road and N. Garver Road.

4906-11-01 (B) (7) Proposed Easements

Structures associated with the NTE Electrical Interconnection will be constructed entirely within the Facility site, currently optioned by NTE from AK Steel, although a small portion of the wiring will extend into the adjacent Duke ROW. The NTE Switchyard and Duke Switchyard will be constructed by NTE, while the NTE Transmission Line Corridor will be constructed by Duke pursuant to the Interconnection Service and Construction Service Agreements to be executed by NTE and Duke during the PJM interconnection process. No other additional right-of-way rights are required. The name and address of the landowner is listed below:

A K Steel
Cincinnati Dayton Road
Middletown, OH 45044

4906-11-01(C) TECHNICAL FEATURES OF THE PROJECT

4906-11-01(C)(1) Description of Technical Features

The Duke Switchyard will comprise a three-breaker ring bus including looping conductors and breakers to accommodate the looped interconnection of the Facility to the existing Duke Transmission System.

The NTE Transmission Line Corridor will be designed for and operated at 345 kV. Attachment A, Figure 2 shows the anticipated layout of the structures proposed to be installed. As can be seen, a total of two new steel monopole pole structures with concrete foundations are proposed. The new structures will use bundled 954 Rail aluminum conductor steel reinforced conductors with 7#8 Alumoweld shield wires. The conductors will be installed on the poles in a vertical configuration and will transition to a horizontal configuration at the Duke Switchyard, crossing above existing transmission lines that traverse the property.

4906-11-01(C)(1) Number and Type of Structures

The Duke Switchyard will be a three-breaker ring bus configuration. As shown on Attachment A, Figure 2, and as noted above, two new structures are proposed for the NTE Transmission Line Corridor. The two steel monopole structures with concrete foundations will be located within the existing Duke ROW. Structure height for the easternmost pole will be 135 feet tall, and the westernmost pole height will be 145 feet.

4906-11-01(C)(1) Right-of-Way and Land Requirements

As discussed above, the NTE Electrical Interconnection will be constructed across land optioned by NTE for the Facility site.

4906-11-01(C)(2)(a) Calculated Electric and Magnetic Field Levels, Line Loadings & Rating

The design line loadings and ratings for the NTE Electrical Interconnection were provided by Duke, identifying the maximum conductor rating as 2,498 amps, with other conditions at lower levels of loadings and ratings.

The electrical and magnetic field (EMF) levels for the NTE Electrical Interconnection were calculated for the conductor configurations that are to be used. Table 1 provides EMF levels calculated for the NTE Transmission Line Corridor. The full EMF study is provided in Attachment B. As shown, EMF levels are below Institute of Electrical and Electronics Engineers (IEEE) maximum permissible limits within and at the edge of the right-of-way.

Table 1
Electric and Magnetic Field Levels

Effect	IEEE Limit for ROW Edge	Maximum Value at ROW Edge	IEEE Limit within ROW	Maximum Value within ROW
Electric Fields (kilovolt per meter [kV/m])	5.0	0.8	10.0	2.3
Magnetic Fields (milligauss [mG])	9,040	69.9	9,040	264

4906-11-01(C)(2)(b) EMF Discussion

The minimum ground clearance is estimated to be 42 feet. The most conservative phasing arrangement was used to calculate maximum EMF levels, and demonstrate they are well below established IEEE thresholds.

4906-11-01(C)(3) Estimated Capital Costs

Estimated capital costs for the NTE Electrical Interconnection have been developed using standard accounting format, as NTE is not a regulated entity. Table 2 provides a breakdown of anticipated costs.

Table 2
NTE Electrical Interconnection Estimated Capital Costs

	Estimated Capital Costs
Access & Site Preparation	\$200,000
Surveying, Test Borings	50,000
Design & Engineering	100,000
NTE Switchyard	Included in generating facility
Duke Switchyard	4,000,000
Overhead Construction (Poles, Wires)	1,000,000
Foundations & Grounding	300,000
Contingency	200,000
Total	\$5,850,000

4906-11-01(D) SOCIOECONOMIC DATA

4906-11-01(D)(1) Land Use and Population Density

The NTE Electrical Interconnection is located entirely within the City of Middletown in Butler County, just north of the Monroe town line and 0.7 mile west of the Butler/Warren County line. The City of Middletown has a population of 48,694 (2010 US Census) and has an area of 26.2 square miles. Population density in the area can, therefore, be assumed to be 1,859 people per square mile.

The property is industrially zoned, and the majority of land uses in the area surrounding the Facility consist of industrial and commercial development, with active agricultural fields to the south and east. Utility easements traverse the area, and scattered residential neighborhoods are located in the surrounding areas. As can be seen in Attachment A, Figures 1 and 2, the NTE Transmission Facilities are entirely located within undeveloped industrially-zoned property comprised of agricultural land with a fringe of forest vegetation. In the immediate vicinity of the NTE Transmission Facilities, there is one residence located within a quarter of a mile from the proposed interconnection activities.

4906-11-01(D)(2) Location and Description of Existing Agricultural Districts

The NTE Electrical Interconnection is not located within the limits of an Agricultural District as defined by Chapter 929 of the Ohio Revised Code. The NTE Electrical Transmission Facilities will alter approximately 5.2 acres of land currently in active agricultural use. Following construction of the Facility, this active agricultural field will no longer be in agricultural production.

4906-11-01(D)(3) Archaeological and Cultural Resources

No significant impact to the continued meaningfulness of registered landmarks of historic, religious, archaeological, scenic, natural, or other cultural significant resource is anticipated as a result of the NTE Electrical Interconnection.

A Phase I archaeological investigation (Attachment C) was conducted for the Facility site, including the location of ground disturbance associated with the proposed NTE Electrical Interconnection. These investigations involved surface collection, subsurface testing, and visual inspection. The work resulted in the identification of three archaeological sites within the area of potential effects. Two of these sites, 33BU1181 and 33BU82, were determined not to possess sufficient research value to be eligible for the National Register of Historic Places (NRHP), therefore, no further archaeological investigations were recommended. One site, 33BU1071, which encompassed a broad scatter of prehistoric chert (flint) tools and chipping debris, was determined to be potentially NRHP-eligible. A Phase II testing program was recommended to evaluate the site on the basis of NRHP eligibility criteria. A Phase II was conducted for this archaeological site by Tetra Tech, Inc. in August 2014 that indicated the need for no further investigation. Attachment C also includes correspondence from the Ohio Historic Preservation Office confirming that no further issues require investigation. No impacts to archaeological resources are anticipated for the NTE Electrical Interconnection.

No cultural resource landmarks or historic structures are located within the NTE Electrical Interconnection study area. A Historic Architecture Survey was conducted for the NTE Middletown Energy Center (Attachment D). This survey identified historic structures (e.g., listed

on the NRHP, eligible for listing or listed on the Ohio Historical Inventory) within a 5-mile radius surrounding the Facility, and assessed potential visibility effects of the proposed 200-foot stack, as well as other associated structures that would be potentially visible from nearby properties. Additional information was subsequently provided to support findings that the Facility would not significantly influence the value of those historic resources. The structures proposed for the NTE Transmission Line Corridor will range from 135 to 145 feet tall, consistent with other existing transmission structures within the Duke ROW. Existing features in the landscape currently include transmission lines, other lighted towers, and modern buildings. The NTE Transmission Line Corridor, at approximately 400 feet in length, will be an insignificant addition to the overall viewscape.

4906-11-01(D)(4) Local Officials to be Notified

Copies of this Letter of Notification have been sent to the following Butler County officials, and the City Middletown officials:

T.C. Rogers, President
Cindy Carpenter, Vice President
Donald Dixon, Commissioner
Butler County Commissioners
Butler County Government Services Center
515 High Street, 6th Floor
Hamilton, OH 45011

Charles Bullington, Chair
Butler County Planning Commission
130 High Street
Hamilton, OH 45011

Gregory J. Wilkens, P.E., P.S.
Butler County Engineer
1921 Fairgrove Avenue
Hamilton, OH 45011

Mayor Lawrence Mulligan, Jr.
City of Middletown
One Donham Plaza
Middletown, OH 45042-1932

Department of Public Works
Engineering Division
City of Middletown
One Donham Plaza
Middletown, OH 45042-1932

A copy was also sent to Middletown City Council and to the Midpointe Library, Middletown. Copies of these cover letters are provided in Attachment E.

4906-11-01(D)(4) Public Information Program

The NTE Electrical Interconnection is part of the overall NTE Middletown Energy Center project, and has been included in associated community discussions and outreach. Facility-related work within the community has been on-going since August 2013. NTE has developed a close working relationship with the City of Middletown officials and has had face-to-face meetings numerous times as the project progressed.

NTE has developed a number of Facility-related presentations for various meetings, and has met with reporters from the local newspapers to advise them of the Facility and its status. NTE has created a web-site (<http://www.middletownenergycenter.com/>), as a means of keeping the community informed, and intends to open a local office in the future.

On March 14, 2014, a pre-application conference meeting was held with the OPSB Staff in Columbus, Ohio to introduce NTE and the Facility. On April 17, 2014, NTE held a public information meeting as required for the generating facility by OAC Rule 4906-5-08. The meeting was properly noticed in the local newspapers. Representatives for the Facility, including NTE personnel and consultants, staffed the meeting, which included a display of the Facility information and an opportunity to speak one-on-one with Facility representatives. Attachment F provides a copy of the materials displayed at the public meeting. In addition, NTE and its representatives have held numerous meetings with local public officials and nearby neighbors to discuss the

Facility. NTE will continue to engage in active public outreach prior to, during, and after Facility construction.

4906-11-01(D)(5) Current or Pending Litigation

There is no litigation involving the NTE Electrical Interconnection, and none is expected.

4906-11-01(D)(6) Local, State and Federal Requirements

The NTE Electrical Interconnection will be designed, constructed, and operated to meet or exceed the requirements of the National Electric Safety Code, Duke design standards, and all applicable Occupational Safety and Health Administration standards. If required, a Notice of Intent will be filed with the Ohio Environmental Protection Agency for authorization of a general permit for construction stormwater discharge. No other permits or authorizations are required for the NTE Electrical Interconnection.

4906-11-01(E)(1) Endangered or Threatened Species

The United States Fish and Wildlife Service (USFWS) and the Ohio Department of Natural Resources (ODNR) were contacted regarding the potential presence of any sensitive natural communities or rare or endangered species in the vicinity of the Facility.

The response letter from ODNR indicates that no records exist in their database of unique ecological attributes or rare or endangered species within the project area of the NTE Middletown Energy Center (Attachment G). The state-threatened Peregrine Falcon is the closest record to the Facility site, with nests more than 0.5 miles north of Oxford State Road. Since the NTE Electrical Interconnection activities are located in the southern portion of the Facility site, no impact to this species is anticipated.

The USFWS correspondence (Attachment G) indicated there were no federal wilderness areas, wildlife refuges, or designated critical habitat within the vicinity of the proposed activities, but requested additional information to confirm the potential for impact to the Indiana bat (*Myotis sodalis*) and northern long-eared bat (*Myotis septentrionalis*). Additional information has been provided to the USFWS documenting that, although field reconnaissance did not specifically identify any roost trees, shagbark hickories of various sizes do occur within the area. Restricting clearing to the winter months, when Indiana bats would not be using roost trees, provides a safeguard against any potential impact to the Indiana bat. USFWS has responded and concurred with the proposed implementation of seasonal tree cutting. No clearing of forested areas is proposed for the NTE Electrical Interconnection.

4906-11-01(E)(2) Areas of Ecological Concern

The ODNR was contacted regarding areas of ecological concern in the vicinity of the NTE Electrical Interconnection. The ODNR has no record of any unique ecological sites, geologic features, animal assemblages, scenic rivers, state wildlife area, nature preserves, parks or forests, national wildlife refuges or other protected natural areas within a 1 mile radius. A copy of their response is attached as Attachment G.

Wetlands were delineated within and around the NTE Electrical Interconnection. Details characterizing wetlands and streams identified within the survey area are provided in the Wetland Delineation and Stream Identification Report provided in Attachment H.

West of Cincinnati Dayton Road two tributaries of Dick's Creek, Shaker Creek and Millers Creek, extend into the area. Both flow through lower terrain within the agricultural and forested upland community and are supported by drainage from surrounding upland areas.

Dicks Creek, a perennial stream flowing east-to-west north of the NTE Electrical Interconnection, is channelized with sparse vegetation along the riparian corridor. Millers Creek, a perennial stream flowing southeast-to-northwest south of the NTE Electrical Interconnection, is a tributary of Shaker Creek and Dicks Creek. Shaker Creek, a perennial stream flowing east-to-northwest southwest of the NTE Electrical Interconnection, is channelized with dense vegetation along the riparian corridor.

Two small emergent wetlands, created by diversion ditches and topographic depressions, are located in the vicinity of the Facility. Wetland 1 is a 0.4-acre paired ditch system located north

of the Facility and NTE Electrical Interconnection, and Wetland 2 is a 1.25-acre paired wetland system located on the southeastern portion of the Facility site.

No impacts are proposed to jurisdictional wetlands for the NTE Electrical Interconnection.

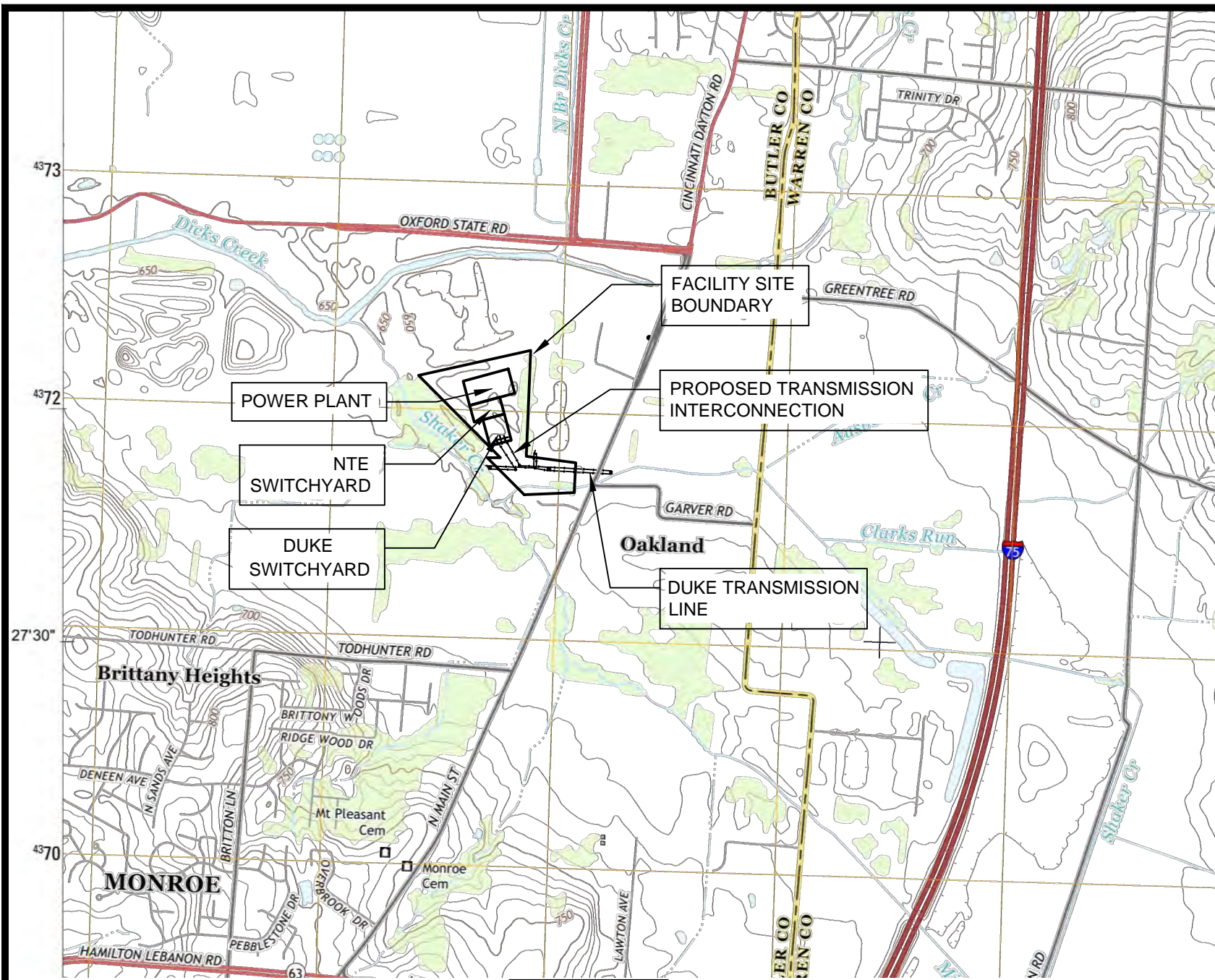
Mapped floodplains exist on the Facility site (Attachment A, Figure 3), and will be considered in the design of the Facility and the NTE Electrical Interconnection.

4906-11-01(E)(3) Additional Information

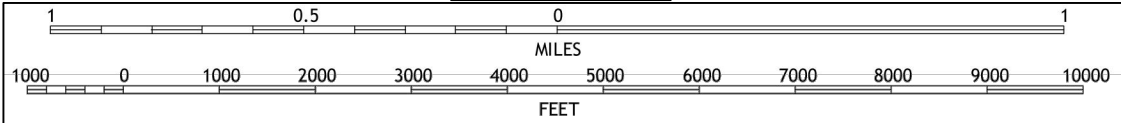
In accordance with the Second Finding and Order in Case No. 12-1981-GE-BRO issued December 17, 2012, Finding No. 5 (c), NTE will cause public notice of this Letter of Notification to be published in the *Journal News*, a newspaper of general circulation in Butler County, Ohio. A copy of the proposed notice is shown on Attachment I. NTE will file with the OPSB the proof of publication of the public notice as soon as it is received.

There are no unusual conditions that will result in significant environmental, social, health or safety impacts from the NTE Electrical Interconnection.

Attachment A: Maps and Figures



SCALE 1:24 000



QUADRANGLE LOCATION

Middletown	Franklin	Springboro
Trenton	Monroe	Lebanon
Glendale	Mason	South Lebanon

ADJOINING 7.5' QUADRANGLES



Title
Figure 1
Electrical Interconnection
Location

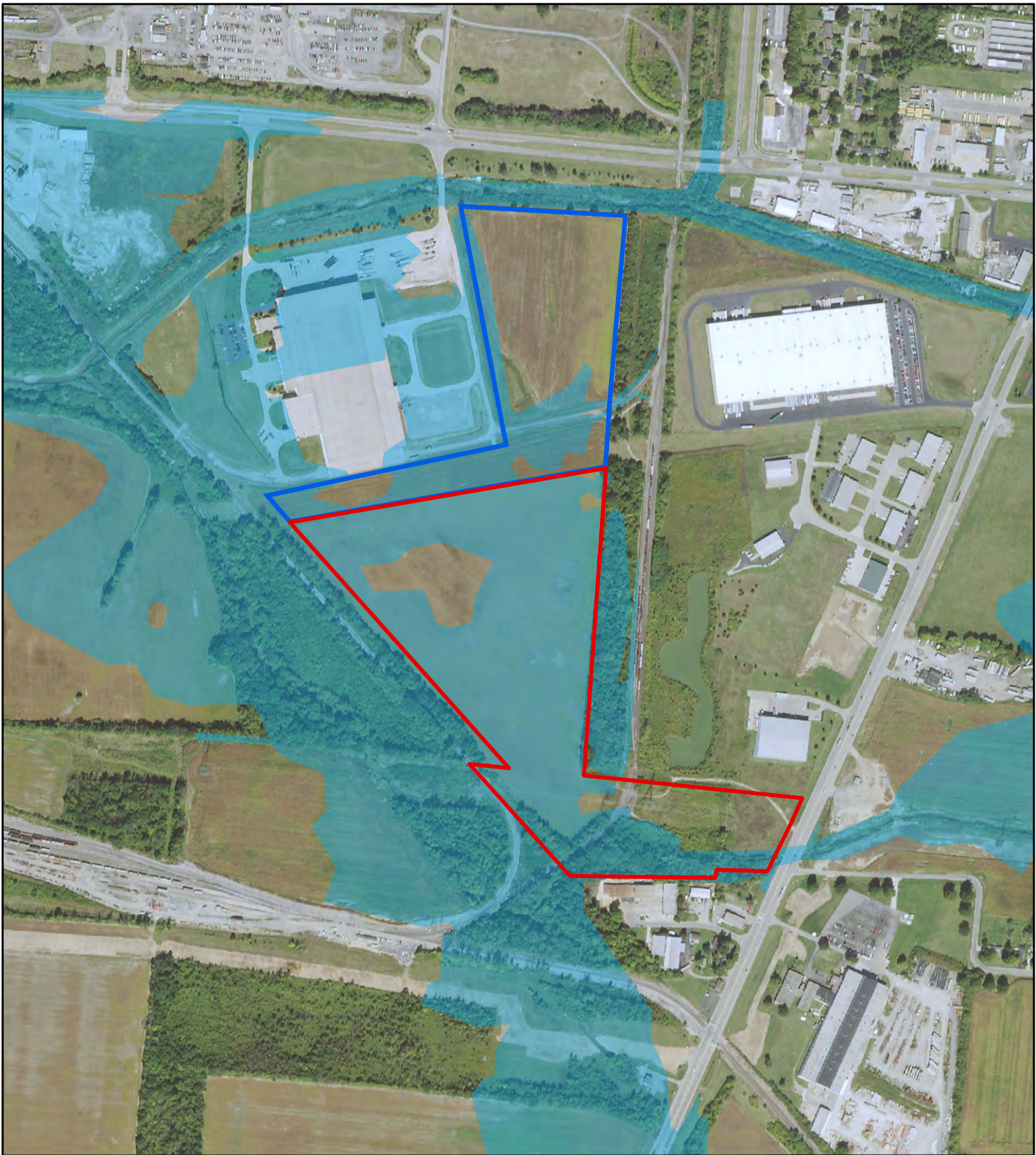
334954OH-ED-300



Diagram illustrating the existing transmission wires and poles. The diagram shows two poles with multiple wires. The height of the pole is indicated as 145'. Labels point to the "EXISTING TRANSMISSION WIRES". The diagram is labeled "NEW DUKE ENERGY SWITCHYARD" at the bottom right.

FOR PERMITTING
ONLY NOT FOR
CONSTRUCTION

PRELIMINARY NOT FOR CONSTRUCTION	Designed	RB	Eng check	RB
	Drawn	KML	Approved	BK
	Dwg check	RB	Project Mngr	NSG
	Scale at ANSI E	Date	Rev	
	AS NOTED	11/2/14	A	
Drawing Number 334954OH-ED-301				



Legend

- Facility Site
- Construction Site
- 100-year Flood Zone

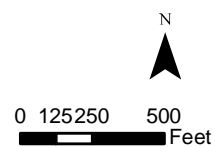


Figure 3
Floodplain Mapping

Attachment B: Electric and Magnetic Field Study

**345kV Transmission Interconnection Tap
EMF Study**

December 29, 2014

Prepared for:



Prepared by:



Mott MacDonald, LLC
One University Ave, Westwood, MA 02090
Ph: (781) 915-0015

Chris Rega
SVP, Engineering and Construction
NTE Ohio LLC
800 South St, Suite 620
Waltham, MA 02453

Reference: NTE Middletown Energy Center
345kV Transmission Interconnection Tap
EMF Study

Dear Mr. Rega:

1. Introduction

This study provides the predicted electric and magnetic field (EMF) effects for the Middletown Energy Center proposed 345kV Interconnection Tap. The Energy Center will interconnect with the existing Duke Energy Ohio (DEO) Foster-Todhunter 345kV line. The interconnection work shall consist of the installation of two steel pole structures to intercept and redirect the Foster-Todhunter circuit to loop through a new 345kV switching substation. The conductors will span from the new pole structures in the DEO right of way directly to the termination structures in the DEO switchyard.

2. EMF Study

A study was performed on the proposed conductors to estimate electric and magnetic fields at one meter above ground. Per information obtained from DEO proposed conductors will be bundled 954 kcmil 45/7 ACSR per phase with loading of 2498 Amperes maximum summer rating and operating at 105% of nominal voltage.

The proposed configuration of the taps is shown in Appendix A. Note that the conductors are in a vertical configuration at the transmission line and will transition to horizontal configuration at the switchyard.

The study was performed using version 12.50x64 of Power Line Systems Inc PLS CADD software which utilizes the EPRI Red Book 1982 methodology.

3. Results

The results of the study are summarized in Table 1 compared against the maximum permissible exposure (MPE) limit of IEEE C95.6-2002. Plots of the results at the cross section of the conductors at their lowest position can be found in Figures 1 and 2.

4. Conclusion

It was found that the predicted EMF levels for the proposed transmission tap are below the IEEE Standard C95.6-2002 maximum permissible exposure limits for the general public for locations both within and at the edge of Right of Ways.

The results should be re-confirmed if the structure geometry, line clearances or loading conditions are modified in the final design.

Respectfully,

Brook Knodel, P.E.
Electrical Group Manager
Transmission & Distribution America

Table 1 Maximum Permissible Exposure(MPE) Values and Maximum Calculated Values				
Effect:	IEEE MPE Limits for General Public (Edge of ROW)	Maximum Calculated Values (Edge of ROW)	IEEE MPE Limits for General Public (within ROW)	Maximum Calculated Values (within ROW)
Electric Field (kV/m)	5.0 kV/m	0.8 kV/m	10.0 kV/m	2.3 kV/m
Magnetic Field (mG)	9040 mG	69.9 mG	9040 mG	264 mG

Figure 1:

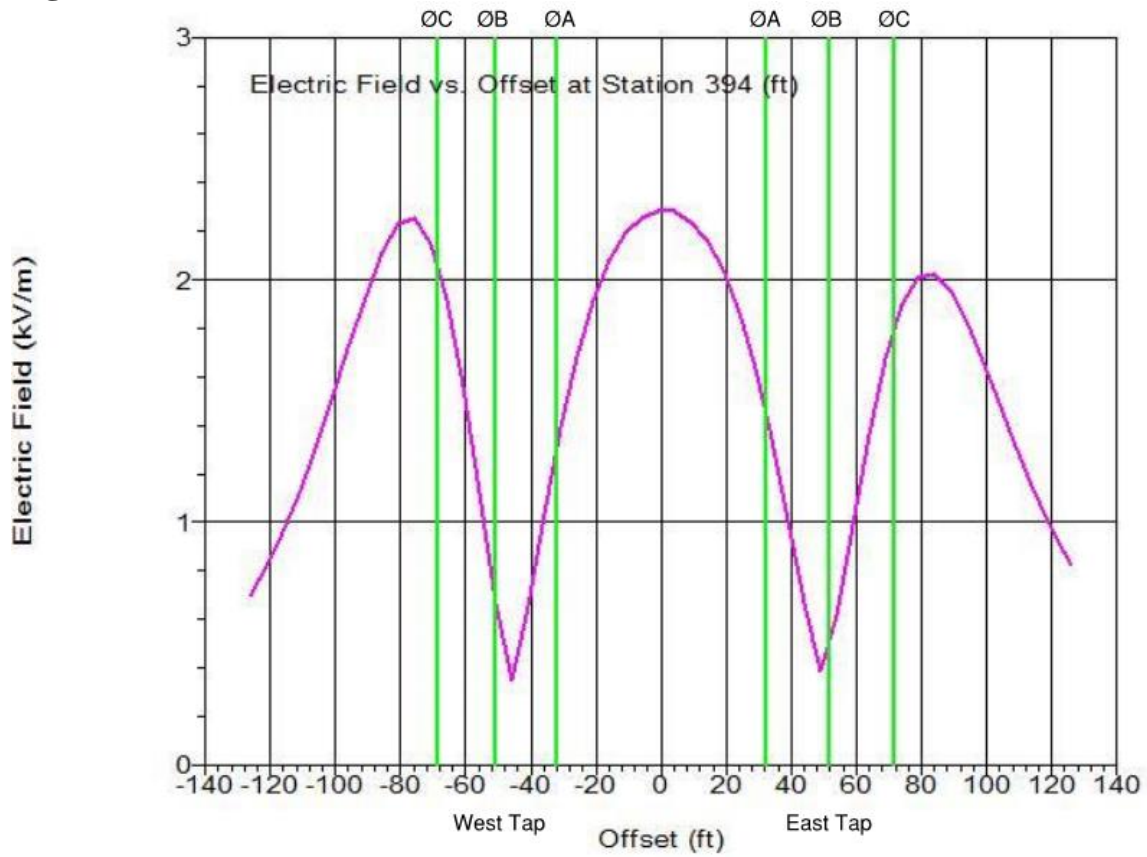
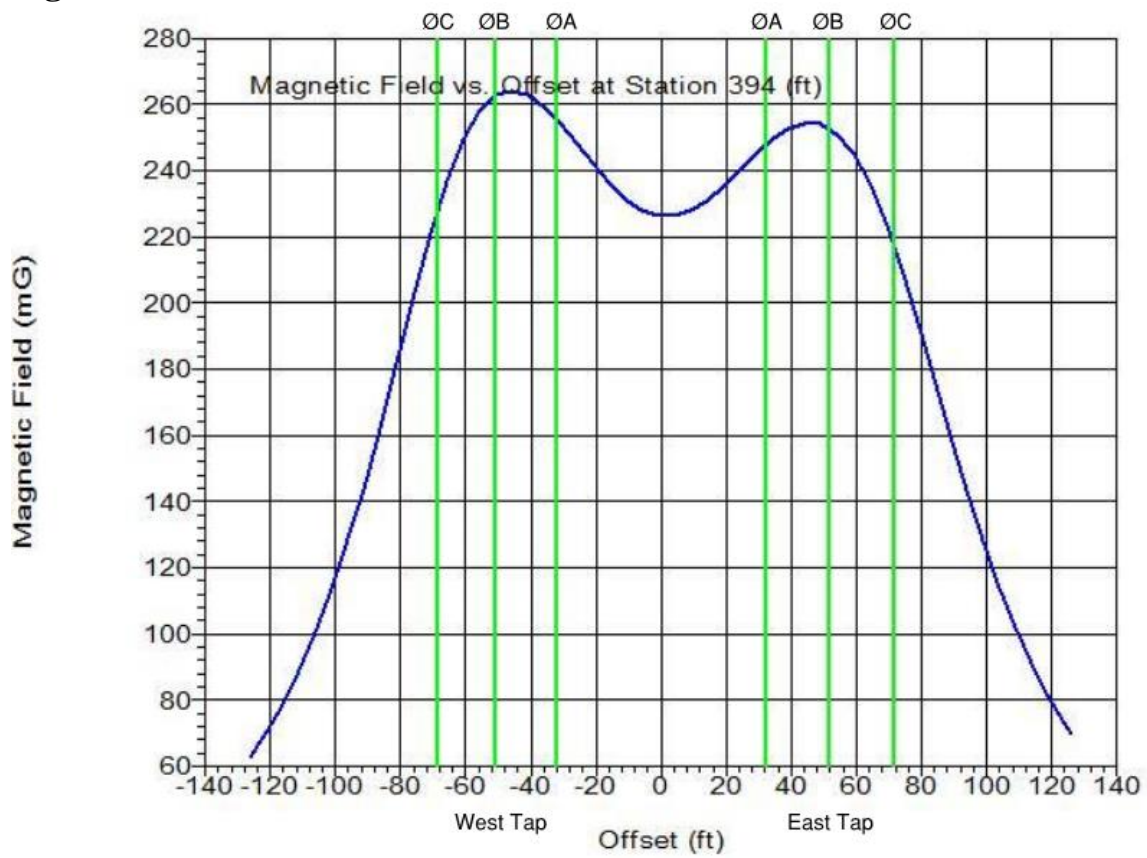
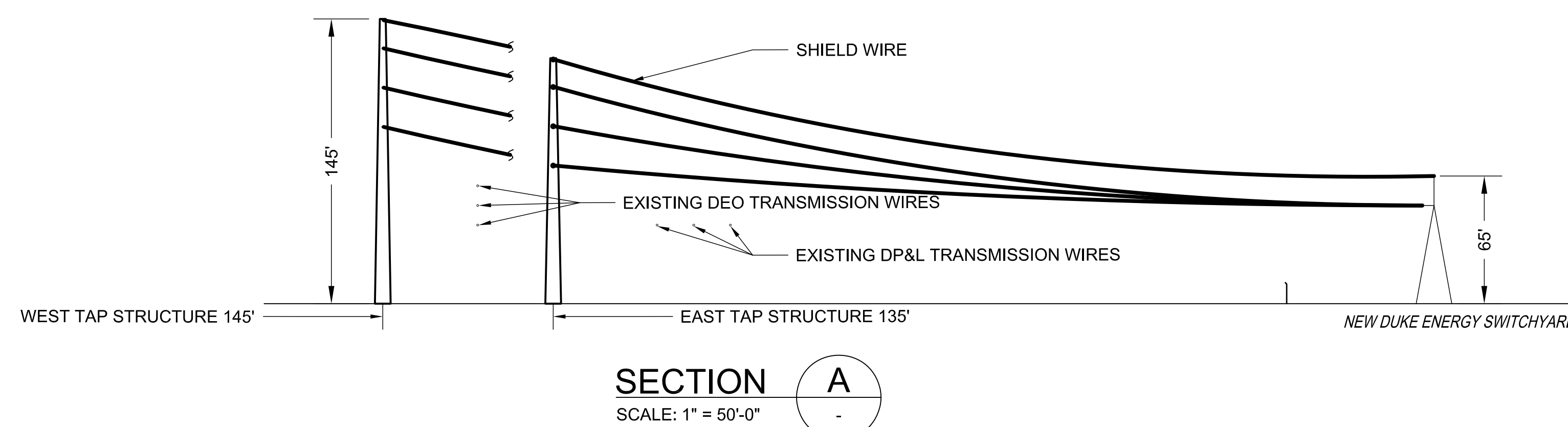


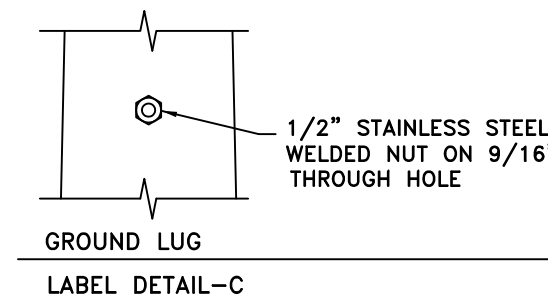
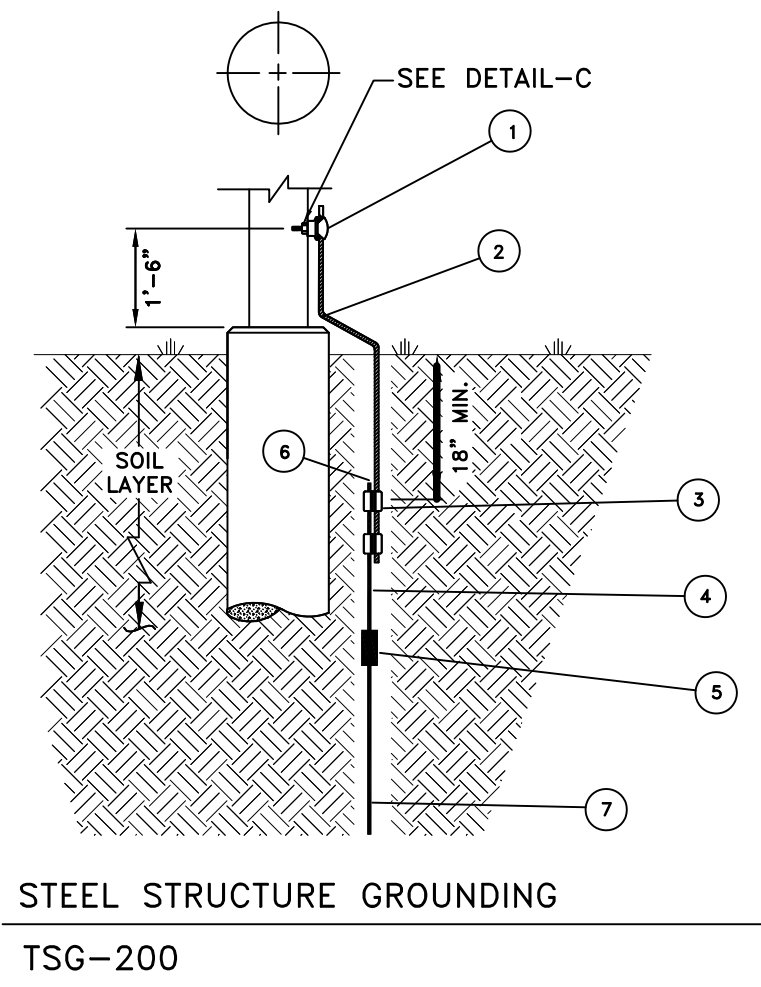
Figure 2:



APPENDIX A



FOR PERMITTING
ONLY NOT FOR
CONSTRUCTION



Notes

Legend

Reference Drawings

A	12/24/14	KML	FOR PERMITTING	RB	BK
Rev	Date	Drawn	Description	Ch'g'd	App'd



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Title	345kV TRANSMISSION INTERCONNECTION TAP STRUCTURES ARRANGEMENT
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PRELIMINARY NOT FOR CONSTRUCTION	Designed	RB	Eng check	RB
	Drawn	KML	Approved	BK
	Dwg check	RB	Project Mngr	NSG
	Scale at ANSI E		Date	Rev
	AS NOTED	12/24/14		A
Drawing Number 334954OH-ED-302				

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This foregoing document was electronically filed with the Public Utilities

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in

Case No(s). 14-2314-EL-BLN

Summary: Letter of Notification for the NTE Middletown Energy Center Electrical Interconnection electronically filed by Teresa Orahod on behalf of Sally Bloomfield