

ADDENDUM TO DETERMINATION OF EFFECTS REPORT AMTRAK ZOO TO PAOLI ELECTRIFICATION TRANSMISSION LINE PROJECT

CHESTER, DELAWARE, MONTGOMERY, AND
PHILADELPHIA COUNTIES, PENNSYLVANIA

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EXECUTIVE SUMMARY

This report presents an Addendum to the Determination of Effects Report dated August 2015 for the proposed Amtrak Zoo to Paoli Electrification Transmission Line Project. The National Railroad Passenger Corporation (Amtrak) is proposing a modernization project that includes the replacement of approximately 325 80- to 100-year-old catenary structures, transmission lines, signal power lines, and the Bryn Mawr Substation building, all of which lie within the right-of-way (ROW) of a 20-mile section of Amtrak's Keystone Corridor between the Philadelphia Zoo and the substation at Paoli. Amtrak is undertaking this project using funding from the Federal Railroad Administration (FRA). Subsequent to the Pennsylvania State Historic Preservation Office (PA SHPO) concurrence with the Determination of Effects Report on October 8, 2015, an increase in heights of some of the catenary pole structures due to a redesign required a re-assessment of effects to some of the identified historic resources. The results of the re-assessment are presented in this Addendum report.

The project's Area of Potential Effects (APE), defined in consultation among FRA, Amtrak, the PA SHPO and other Consulting Parties was presented in the *Area of Potential Effects Delineation Study* dated September 14, 2014. The *Historic Resources Study*, also dated September 14, 2014, included 28 historic properties, one of which was the Pennsylvania Railroad Main Line (Philadelphia to Harrisburg) (Key No. 105675). The PA SHPO concurred with the identification of the 28 historic properties on March 16, 2015, and April 24, 2015.

The subsequent effects analysis resulted in a finding of Adverse Effect because of the direct physical effects of the project to the Pennsylvania Railroad Main Line (Philadelphia to Harrisburg), due to the removal and replacement of the catenary structures with taller structures and the demolition of the Bryn Mawr Substation, both of which are Contributing Resources.

As a result of the public involvement meetings during the design process, Amtrak minimized the visual impacts caused by the taller catenary structures by reducing the pole heights while retaining the height necessary to meet regulatory and safety requirements. Minimization of the tree trimming necessary for construction also was achieved by the preparation of a set of tree trimming plans. An assessment of the project's indirect visual effects on the historic properties in the APE resulted in the finding that none of the visual effects, including the introduction of the increased catenary structure heights and the tree trimming, will adversely affect the characteristics that qualify the resources for listing in the National Register of Historic Places (NRHP). The PA SHPO concurred with the finding on October 8, 2015 (McLearn 2015).

In January 2016, following refinement of the plan for tree trimming required for the installation of the new catenary structures, Amtrak directed the redesign of the transmission lines and 82 catenary structures to eliminate tree trimming beyond the ROW in areas where it is narrow, primarily in residential areas. The redesign included the vertical stacking of the lines on the track-side (inside) of the catenary structures. This will result in an increase in pole heights of 10 to 15 feet in some locations.

Because of the catenary structure height increase in certain locations, a re-assessment of the project's indirect visual effects on historic properties, including the railroad itself, was completed as part of this addendum. On behalf of Amtrak and the FRA, Stell Environmental (Stell), as a subconsultant to The Burns Group, found during the re-assessment that the current APE remains

the same and that seven (7) historic properties, including the railroad, may be affected by the revised design.

Re-assessment of the effects found that, despite the height increase at the locations, the indirect visual effects caused by the increased catenary structure heights will not adversely affect the characteristics that qualify the historic properties for listing in the NRHP. However, the previous finding of Adverse Effect remains the same for the railroad because of the direct physical effects of the project to the Pennsylvania Railroad Main Line (Philadelphia to Harrisburg).

Therefore, the re-assessment of effects for historic properties for the Amtrak Philadelphia Zoo to Paoli Electrification Transmission Line Project yields the same finding as the first Determination of Effects assessment—that the project will have an *Adverse Effect* on historic properties, because of the adverse effect on the Pennsylvania Railroad Main Line (Philadelphia to Harrisburg) (Key No. 105675).

Subsequent to these studies, Stell discovered that one of the 28 historic properties, the Villanova Station (Key No. 827801), was only determined NRHP-eligible as a contributing resource to the Pennsylvania Railroad Main Line (Philadelphia to Harrisburg) (Key No. 105675) and has not been determined individually NRHP-eligible. Therefore, only 27 individually NRHP-eligible or -listed historic resources are located within the project APE. To maintain consistency among project documents, the “resource number” assigned to each of the originally listed 28 resources has been retained for each of the remaining 27 resources.

1.0 INTRODUCTION

Amtrak (National Railroad Passenger Corporation) proposes to upgrade the overhead electrification system along a portion of its Keystone Corridor between the Philadelphia Zoo and Paoli substations in Pennsylvania (Appendix A: Figures 1 and 2). Amtrak is undertaking this project using funding from the Federal Railroad Administration (FRA). The 20-mile-long project area lies within a section of the corridor that stretches between Philadelphia and Harrisburg, historically known as the Pennsylvania Railroad Main Line (Philadelphia to Harrisburg) (Key No. 105675), a linear historic district that was determined eligible for listing in the National Register of Historic Places (NRHP) by the Pennsylvania State Historic Preservation Office (PA SHPO) on September 14, 1995, and again on November 16, 2007. The historic district is eligible under Criterion A in the areas of transportation and economics and Criterion C for engineering. It contains a number of contributing resources, including the catenary structures and the Bryn Mawr Substation; the project involves the removal and replacement of both of these resources as part of the project.

Because FRA funding is involved, this project is subject to review and compliance under Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (54 U.S.C 470 § 306108), and *Procedures for the Protection of Historic and Cultural Properties* set forth in 36 Code of Federal Regulations (CFR) 800, as amended. Additional legislation and guidance followed in the review of this project included:

- “Working with Section 106” Guidance published by the ACHP on <https://achp.org>;
- Federal-Aid Highway Act of 1966, as amended in 1968;
- Executive Order 11593, Protection and Enhancement of the Cultural Environment; and
- 42 U.S.C. § 4331(b) (4) and 4332, the NHPA.
- *Guidelines for Architectural Investigations in Pennsylvania*, 2014.
http://www.phmc.pa.gov/Preservation/Project-Review/Pages/Survey-Standards.aspx#.VwP51j7D_IU.

Stell Environmental (Stell) conducted the required cultural resources studies between 2011 and 2016 as a subconsultant to The Burns Group, on behalf of Amtrak and the FRA.

1.1 HISTORY OF THE PROJECT

The Area of Potential Effects (APE) was developed through consultation among FRA, Amtrak, the PA SHPO, and other Consulting Parties and was presented in *Area of Potential Effects Delineation Studies* (Ross 2014). Stell completed identification and eligibility studies between 2012 and 2015 and found that there are 28 historic properties in the project’s APE, including the subject railroad. The results of the studies are presented in the June 2015 report *Historic Resources Study*, which was finalized after incorporating FRA eligibility determinations made in consultation with PA SHPO (Ross 2015b, 2015c). The PA SHPO concurred with FRA’s National Register eligibility determinations on March 16, 2015, and April 24, 2015 (MacDonald 2015a, 2015b) (Appendix B).

Following PA SHPO concurrence with the eligibility determinations, Stell conducted an effects assessment to determine the direct and indirect effects of the proposed undertaking on all of the historic properties in the APE. Based on this assessment, FRA determined that the proposed project will have an Adverse Effect on one of the historic properties, the Pennsylvania Railroad Main Line (Philadelphia to Harrisburg) (Key No. 105675). The project will have direct, physical

effects on the railroad resource because the railroad's contributing resources, the catenary structures and the Bryn Mawr Substation building, will be removed and replaced. An analysis of the indirect effects of the project, those that encompass visual, audible, and other types of effects, found that the project will not adversely affect the other historic properties in the APE. The PA SHPO concurred with the finding on October 8, 2015 (McLearn 2015) (Appendix B). The results of the effects assessment can be found in the *Determination of Effects Report* dated August 2015 (Ross 2015a).

FRA and Amtrak have consulted with the PA SHPO and other Consulting Parties throughout the course of the project. Measures to minimize and mitigate the adverse effects of the project have been identified in consultation with the Consulting Parties. FRA and Amtrak included measures to minimize the adverse effects by keeping the height of the new catenary structures as low as possible while meeting regulatory and safety requirements, locating new catenary structures within close proximity to the existing ones, and developing tree trimming plans to indicate locations where overhanging trees limbs within the ROW will be trimmed to enable catenary structure replacement.

The measures to mitigate the adverse effects of this project that were identified at public and Consulting Parties meetings are included in a Memorandum of Agreement (MOA) between FRA, PA SHPO, and Amtrak that is currently being developed.

1.2 REVISED NUMBER OF HISTORIC PROPERTIES WITHIN THE PROJECT APE

Subsequent to the development of the APE, the submission of the Determination of Eligibility and Determination of Effects reports, and concurrence by the PA SHPO, Stell discovered that one of the 28 historic properties, the Villanova Station (Key No. 827801), was only determined NRHP-eligible as a contributing resource to the Pennsylvania Railroad Main Line (Philadelphia to Harrisburg) (Key No. 105675) and has not been determined individually NRHP-eligible. Therefore, only 27 individually NRHP-eligible or -listed historic resources are located within the project APE. To maintain consistency among project documents, the "resource number" assigned to each resource remains the same.

1.3 REVISED CATENARY STRUCTURE HEIGHTS

Following the submission of the Determination of Effects Report and concurrence by the PA SHPO, the design of some of the catenary structures was revised. In December 2015, as a result of meetings with Amtrak, The Burns Group was directed to redesign a number of catenary pole structures in residential areas where the ROW is narrow in order to avoid tree trimming that is necessary for the catenary installation from occurring outside the Amtrak ROW line on adjacent properties. To contain tree trimming within the existing ROW, the design of the catenary structures was revised to vertically stack the transmission and catenary lines on the track-side (inside) of the catenary structures (Appendix A). This will result in an increase in pole height of 10 to 15 feet in some locations to meet required separation distances between the electrified lines (Appendix A: Figure 3).

Because of the height increase in certain locations, Stell completed a review to determine which of the 27 historic properties, including the railroad itself, would require re-assessment of the project's indirect visual effects due to the redesigned catenary structures. The re-assessment found that the current APE remains the same and that seven (7) historic properties could be

affected by the redesigned structures. The historic properties in the APE in the vicinity of the redesigned catenary structures are:

- Resource 8: Merion Station (Key No. 097341)
- Resource 9: Wynnewood Station (Key No. 097340)
- Resource 13: Villanova University Campus (Key No. 105136)
- Resource 20: Strafford Station (Key No. 079668)
- Resource 21: Cramond (Key No. 050893)
- Resource 22: Grove Avenue Service Station (Key No. 112814)
- Resource 24: Pennsylvania Railroad Main Line (Philadelphia to Harrisburg) (Key No. 105675).

The Definition of Effect and the Criteria of Adverse Effect were applied to each historic property (Advisory Council on Historic Preservation [ACHP] 2014), and FRA has determined that, despite the further height increase at these locations, the visual effects caused by the increased catenary structure heights would not adversely affect the characteristics that qualify the resources for listing in the NRHP. As with the initial assessment, the railroad infrastructure, including its catenary system, has historically been an integral and necessary component of the railroad and its overall physical setting. The nineteenth and early twentieth century siting and construction of the historic properties in the railroad's immediate vicinity were a direct result of the railroad's presence. The properties have historically had the railroad and all features of its accompanying infrastructure within their view. Thus, the presence of new catenary structures, including the height addition, will not result in an adverse effect. The results of the effects assessment follow in Section 2.0.

2.0 EFFECTS RE-ASSESSMENT ON HISTORIC PROPERTIES

Stell conducted the effects re-assessment on the seven (7) historic properties using the Definition of Effect and Criteria of Adverse Effect described in the *Determination of Effects Report* and is presented below. Presented first is a comparison of Existing Structures and 2014 and 2016 Designed Catenary Structures, followed by the application of the Definition of Effect and the Criteria of Adverse Effect to each resource, where warranted. Because the southern and northern pole heights sometimes differ, each is indicated with a (S) or a (N) in the tables, depending on which side they are located within the ROW. In the 2016 Design column, only the poles with heights that are being changed in the 2016 design are included in the tables.

2.1 RESOURCE 8: MERION STATION (KEY NO. 097341)

Merion Station, in Lower Merion Township, Montgomery County was determined individually eligible for NRHP listing on November 8, 1991 (CRGIS 2015). The station building complex, a combination train station and U.S. Post Office, is significant under Criterion A in the area of transportation for its association with the Pennsylvania Railroad Main Line, and under Criterion C in the area of architecture. Table 2-1 below shows a comparison of the existing pole heights with the 2014 and 2016 designed pole heights. Tables 2-2 and 2-3 present the results of the effects assessment.

Table 2-1: Comparison of Existing and Redesigned Catenary Structure Heights near Merion Station

Existing Structures	2014 Design	2016 Design
Two (2) sets of structures with poles 50'-2" high	Two (2) sets of structures with poles ranging from 56'- $\frac{3}{4}$ " to 75'-2" high T-146 - 75'-2" (S) and 60'-2" (N) T-147 - 56'- $\frac{3}{4}$ " (S) and 58'- $\frac{3}{4}$ " (N)	Two (2) sets of structures with poles ranging from 58'- $\frac{3}{4}$ " to 75'-2" high T-147 - 64'- $\frac{3}{4}$ " (S) All other poles remain the same as 2014 design.

Table 2-2: Results of Application of Definition of Effect for Merion Station

Definition of Effect	Evaluation
An <i>Effect</i> may occur when there is alteration to the characteristics of a historic property qualifying it for inclusion in or eligibility for the National Register as defined in 36 CFR 800.16(i).	The location of the new structure near the station building may introduce visual elements that are incompatible with the setting and that may alter the characteristics that qualify the station for listing in the NRHP, which include its distinctive Craftsman-style architecture.
Finding	The proposed undertaking will have an <i>Effect</i> on the Merion Station, resulting in a finding of Historic Properties Affected . Pursuant to 36 CFR Part 800.11(e) the Criteria of Adverse Effect must be applied.

Table 2-3: Results of Application of Criteria of Adverse Effect for Merion Station

Criteria of Adverse Effect	Evaluation
<i>Adverse effects on historic properties include, but may not be limited to:</i>	
(i) Physical destruction of or damage to all or part of a property	The proposed project will not result in physical destruction or damage to the Merion Station.
(ii) Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation, and provision for handicapped access that is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR Part 68) and applicable guidelines	The replacement of the catenary structures will not alter the Merion Station in a manner that is inconsistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR Part 68) and applicable guidelines.
(iii) Removal of the property from its historic location	The proposed project will not result in the removal of the Merion Station from its historic location.
(iv) Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance	The proposed project will not change the character of the station's use. The 7'-11" to 25'-0" height increase of the new catenary structures will change the character of the physical features within the property's setting. The change in character will be minimal, however. The introduction of the increased structure heights will not be incompatible with the existing setting as it contributes to the property's historic significance. The station's significance is derived from its direct relationship with the railroad. The railroad and its features, including catenary structures, have always been an important part of the station's setting.
(v) Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features	The two new catenary structures to be installed near the station building will introduce visual elements; however they will not be incompatible with the railroad-related property and will not diminish the integrity of the property and the character-defining features of its Craftsman-style architecture. The tree trimming will not introduce visual elements that diminish the integrity of the property's significant historic features. The removal and installation of new catenary structures will introduce audible and vibration elements; however, they will be of a temporary nature and will cease upon project completion.
(vi) Neglect of a property, which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization	The proposed project will not result in the neglect or deterioration of the Merion Station.
(vii) Transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance	The proposed project will not result in the transfer, lease, or sale of the Merion Station.
Finding	The proposed project will have <i>No Adverse Effect</i> on the Merion Station.

2.2 RESOURCE 9: WYNNEWOOD STATION (KEY NO. 097340)

Wynnewood Station, in Lower Merion Township, Montgomery County, was constructed in 1870 and was determined individually eligible for NRHP listing on November 8, 1991 (CRGIS 2015). The station is significant under Criterion A in the area of transportation and under Criterion C in the area of architecture. There are no catenary structures currently in front of the station buildings; however, there are two sets of structures to the east and west of the station. Table 2-4 below shows a comparison of the existing pole heights and the 2014 and 2016 designed pole heights. Table 2-5 presents the results of the effects assessment.

Table 2-4: Comparison of Existing and Redesigned Catenary Structure Heights near Wynnewood Station

Existing Structures	2014 Design	2016 Design
Two (2) sets of structures with poles at 50'-2" high	Two (2) sets of structures ranging from 57'-6" to 60'-2" high: T-179 - 60'-2" (S) and 60'-2" (N) T-180 - 58'-6" (S) and 57'-6" (N)	Two (2) sets of structures ranging from 58'-6" to 65'-6" high: T-180 - 65'-6" (N). All other poles remain the same as 2014 design.

Table 2-5: Results of Application of Definition of Effect for Wynnewood Station

Definition of Effect	Evaluation
An <i>Effect</i> may occur when there is alteration to the characteristics of a historic property qualifying it for inclusion in or eligibility for the National Register as defined in 36 CFR 800.16(i).	The new structures will be at distances of approximately 50'-0" and 125'-0" from the station buildings. Because of this distance, the proposed project will not introduce incompatible visual elements to the station's setting, and it will not alter any of the characteristics that qualify the station for listing in the NRHP, including its Stick style architecture.
Finding	The proposed project will not have an <i>Effect</i> on the Wynnewood Station, resulting in a finding of <i>No Historic Properties Affected</i> .

2.3 RESOURCE 13: VILLANOVA UNIVERSITY CAMPUS (KEY NO. 105136)

Villanova University Campus, in Radnor Township, Delaware County, was determined eligible for NRHP listing on April 4, 1995 (CRGIS 2015). The resource is significant under Criterion A in the area of education and under Criterion C in the area of architecture. Nine (9) sets of poles measuring 50'-2"-high in the ROW adjacent to Villanova University Campus will be removed and replaced with 12 new sets of poles ranging from approximately 64'-3½" to 88'-7¾" high. The majority of the 2016 revised pole height increases occur to the poles on the southern side of the ROW. Table 2-6 below shows a comparison of the existing pole heights and the 2014 and revised 2016 designed pole heights. Tables 2-7 and 2-8 present the results of the effects assessment.

Table 2-6: Comparison of Existing and Redesigned Catenary Structure Heights adjacent to Villanova University Campus

Existing Structures	2014 Design	2016 Design
<p>Nine (9) sets of structures with poles at 50'-2" high</p>	<p>12 sets of structures with poles ranging from 59'-3½" to 82'-2":</p> <p>T-268 - 60'-7" (S) and 60'-7" (N) T-269 - 59'-3½" (S) and 59'-3½" (N) T-270 - 65'-1½" (S) and 65'-1½" (N) T-270A - 68'-10" (S) and 68'-10" (N) T-271 - 73'-7¾" (S) and 73'-7¾" (N) T-272 - 73'-5¼" (S) and 73'-5¼" (N) T-273 - 71'-7¾" (S) and 71'-7¾" (N) T-274 - 69'-10½" (S) and 69'-10½" (N) T-275 - 82'-2" (S) and 82'-2" (N) T-277 - 80'-9¼" (S) and 80'-9¼" (N) T-278 - 80'-½" (S) and 78'-½" (N) T-279 - 72'-2" (S) and 72'-2" (N)</p>	<p>12 sets of structures with poles ranging from 64'-3½" to 88'-7¾":</p> <p>T-268 - 75'-7" (S) and 68'-7" (N) T-269 - 74'-3½" (S) and 64'-3½" (N) T-270 - 80'-1½" (S) T-270A - 83'-10" (S) T-271 - 88'-7¾" (S) T-272 - 88'-5¼" (S) T-273 - 86'-7¾" (S) T-274 - 84'-10½" (S)</p> <p>T-278 - 73'-½" (S) and 71'-½" (N)</p> <p>All other poles remain the same as 2014 design.</p>

Table 2-7: Results of Application of Definition of Effect for Villanova University Campus

Definition of Effect	Evaluation
<p>An <i>Effect</i> may occur when there is alteration to the characteristics of a historic property qualifying it for inclusion in or eligibility for the National Register as defined in 36 CFR 800.16(i).</p>	<p>Nine existing 50'-2"-high sets of catenary structures will be replaced with 12 new catenary structures, with poles ranging from 64'-3½" to 88'-7¾" in height. Because the structure locations are within the ROW adjacent to the historic district, the project may introduce a visual element to the property's setting, and it may alter the characteristics that qualify the property for listing in the NRHP.</p>
<p>Finding</p>	<p>The proposed project will have an <i>Effect</i> on the Villanova University Campus, resulting in a finding of <i>Historic Properties Affected</i>. Pursuant to 36 CFR Part 800.11(e) the Criteria of Adverse Effect must be applied.</p>

Table 2-8: Results of Application of Criteria of Adverse Effect for Villanova University Campus

Criteria of Adverse Effect	Evaluation
<i>Adverse effects on historic properties include, but may not be limited to:</i>	
(i) Physical destruction of or damage to all or part of a property	The proposed project will not result in destruction or damage to the Villanova University Campus.
(ii) Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation, and provision for handicapped access that is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR Part 68) and applicable guidelines	The replacement of the nine catenary structures with 12 higher structures will not alter the Villanova University Campus in a manner that is inconsistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR Part 68) and applicable guidelines.
(iii) Removal of the property from its historic location	The proposed project will not remove Villanova University Campus from its historic location.
(iv) Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance	The proposed project will not change the character of the use of the Villanova University Campus. The 14'-1½" to 38'-5¾" height increase in the 12 new catenary structures will, however, change the character of some physical features within the historic property's setting. The change in character will be minimal because the introduction of the increased structure height will not be incompatible with the existing setting, as it contributes to the historic significance of the campus.
(v) Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features	The installation of the structures will introduce visual elements; however, they will not be incompatible with the property and its significant historic features and will not affect the property's ability to convey its significance in education and architecture. The proposed project will introduce incompatible audible and vibration elements; however, they will be of a temporary nature during the work at this location and will cease upon project completion.
(vi) Neglect of a property, which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization	The proposed project will not result in the neglect or deterioration of the Villanova University Campus.
(vii) Transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance	The proposed project will not result in the transfer, lease, or sale of the Villanova University Campus.
Finding	The proposed project will have <i>No Adverse Effect</i> on the Villanova University Campus.

2.4 RESOURCE 20: STRAFFORD STATION (KEY NO. 079668)

Strafford Station, in Tredyffrin Township, Chester County, was listed in the NRHP on July 26, 1984 (CRGIS 2015). The station is significant under Criterion A in the area of transportation and under Criterion C in the area of architecture. One new structure will be placed approximately 10'-0" east of the existing structure, which currently lies within the NRHP boundary. The new structure also lies within the NRHP boundary and will be located approximately 20'-0" east of the station building (Goshorn 1984). Table 2-9 below shows a comparison of the existing pole heights and the 2014 and revised 2016 designed pole heights. Tables 2-10 and 2-11 present the results of the effects assessment.

Table 2-9: Comparison of Existing and Redesigned Catenary Structure Heights near Strafford Station

Existing Structures	2014 Design	2016 Design
One (1) set of structures with poles at 50'-2" high	One (1) set of structures with both poles at 61'-8¼" high: T-348 - 61'-8¼" (S) and 61'-8¼" (N)	One (1) set of structures with poles at 61'-8¼" and 69'-8¼" high: T-348 - 69'-8¼"(N) The southern pole remains the same as 2014 design.

Table 2-10: Results of Application of Definition of Effect for Strafford Station

Definition of Effect	Evaluation
An <i>Effect</i> may occur when there is alteration to the characteristics of a historic property qualifying it for inclusion in or eligibility for the National Register as defined in 36 CFR 800.16(i).	One structure with poles at 61'-8¼" and 69'-8¼" will replace a structure with poles that are 50'-2" high. Because of its location 20'-0" east of the station building and its location within the boundaries of the historic property, the project may introduce incompatible visual elements to the station's setting, and it may alter the characteristics that qualify the property for listing in the NRHP.
Finding	The proposed project will have an <i>Effect</i> on Strafford Station, resulting in a finding of <i>Historic Properties Affected</i> . Pursuant to 36 CFR Part 800.11(e) the Criteria of Adverse Effect must be applied.

Table 2-11: Results of Application of Criteria of Adverse Effect for Strafford Station

Criteria of Adverse Effect	Evaluation
<i>Adverse effects on historic properties include, but may not be limited to:</i>	
(i) Physical destruction of or damage to all or part of a property	The proposed project will not result in physical destruction of or damage to Strafford Station.

Criteria of Adverse Effect	Evaluation
(ii) Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation, and provision for handicapped access that is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR Part 68) and applicable guidelines	The installation of the 61'-8¼" and 69'-8¼" high poles will not alter Strafford Station in a manner that is inconsistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR Part 68) and applicable guidelines.
(iii) Removal of the property from its historic location	The proposed project will not remove Strafford Station, or any of its elements, from its historic location.
(iv) Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance	The proposed project will not change the character of the station's use. The 11'-6¼" to 19'-6¼" height increase in the poles and their shifted location will change the character of the physical features. The change in character will be minimal, however, because the increased structure height will not be incompatible with the existing setting and will not affect the property's ability to convey its historic significance. The railroad's infrastructure, including the catenary structures and overhead system, has always been an integral part of the station's setting.
(v) Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features	The installation of the taller catenary structure in front of the station building will introduce a visual element; however it will not be incompatible with the station and will not diminish the integrity of the station's distinctive architectural features. The tree trimming will not introduce visual elements that diminish the integrity of the property's significant historic features. The proposed project will introduce incompatible audible and vibration elements; however, they will be of a temporary nature and will cease upon project completion.
(vi) Neglect of a property, which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization	The project will not result in the neglect or deterioration of the Strafford Station.
(vii) Transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance	The project will not result in the transfer, lease, or sale of the Strafford Station.
Finding	The proposed project will have <i>No Adverse Effect</i> on the Strafford Station.

2.5 RESOURCE 21: CRAMOND (KEY NO. 050893)

The house known as Cramond, in Tredyffrin Township, Chester County, was listed in the NRHP on June 30, 1983 (CRGIS 2015). The property is significant under Criterion C in the area of architecture. Cramond is located more than 200'-0" north of the railroad ROW at Strafford Station. Table 2-12 below shows a comparison of the existing pole heights and the 2014 and

revised 2016 designed pole heights. Tables 2-13 and 2-14 present the results of the effects assessment.

Table 2-12: Comparison of Existing and Redesigned Catenary Structure Heights near Cramond

Existing Structures	2014 Design	2016 Design
One (1) set of structures with poles at 50'-2" high	One (1) set of structures with both poles at 61'-8¼" high: T-348 - 61'-8¼"(S) and 61'-8¼"(N)	One (1) set of structures with poles at 61'-8¼" and 69'-8 ¼" high: T-348 - 69'-8¼" (N) The southern pole remains the same as 2014 design.

Table 2-13: Results of Application of Definition of Effect for Cramond

Definition of Effect	Evaluation
An <i>Effect</i> may occur when there is alteration to the characteristics of a historic property qualifying it for inclusion in or eligibility for the National Register as defined in 36 CFR 800.16(i).	One set of structures with poles at 61'-8¼" and 69'-8¼" high will replace a structure with 50'-2"-high poles. The structure will be at a distance of 150'-0" from the historic property. Because of the distance, the project will not cause the introduction of incompatible visual elements to its setting. The project will not alter the characteristics that qualify the property for listing in the NRHP, including its architectural distinction and the fact that it was designed by a notable architectural firm.
Finding	The proposed project will not have an <i>Effect</i> on Cramond, resulting in a finding of <i>No Historic Properties Affected</i> .

2.6 RESOURCE 22: GROVE AVENUE SERVICE STATION (KEY NO. 112814)

The Grove Avenue Service Station in Tredyffrin Township, Chester County, was determined eligible for NRHP listing on March 2, 2000 (CRGIS 2015). The property is significant under Criterion A for transportation and under Criterion C in the area of architecture (CRGIS 2015). Table 2-14 below shows a comparison of the existing pole heights and the 2014 and revised 2016 designed pole heights. Table 2-15 presents the results of the effects assessment.

Table 2-14: Comparison of Existing and Redesigned Catenary Structure Heights near the Grove Avenue Service Station

Existing Structures	2014 Design	2016 Design
One (1) set of structures with poles at 50'-2" high	One (1) set of structures with both poles at 60'-1½" high: T-362 - 60'-1½" (S) and 60'-1½" (N)	One (1) set of structures with poles at 60'-1½" high and 70'-1½" high: T-362 - 70'-1½" (N) The southern pole remains the same as 2014 design.

Table 2-15: Results of Application of Definition of Effect for Grove Avenue Service Station

Definition of Effect	Evaluation
An <i>Effect</i> may occur when there is alteration to the characteristics of a historic property qualifying it for inclusion in or eligibility for the National Register as defined in 36 CFR 800.16(i).	One set of structures with poles at 60'-1½" and 70'-1½" high will replace an existing 50'-2"-high structure approximately 100'-0" northwest of the Grove Avenue Service Station. Because of the new structure's distance from the property and its location on the elevated tracks above the property, the project will not cause the introduction of incompatible visual elements. It will not alter the characteristics that qualify the service station for listing in the NRHP, including its architecture.
Finding	The proposed project will not have an <i>Effect</i> on the Grove Avenue Service Station, resulting in a finding of <i>No Historic Properties Affected</i> .

2.7 RESOURCE 24: PENNSYLVANIA RAILROAD MAIN LINE (PHILADELPHIA TO HARRISBURG) (KEY NO. 105675)

The Pennsylvania Railroad Main Line (Philadelphia to Harrisburg) railroad corridor historic district was determined eligible for NRHP-listing on September 14, 1993, and on November 16, 2007 (CRGIS 2015). The resource meets NRHP Criteria A and C for its statewide significance in transportation, economy, and the development of Pennsylvania's industries and communities. A total of 325 catenary structures, including their poles, are proposed to be removed and replaced along a 16-mile-long section between 51st Street and the Paoli Substation. Along with their replacement, the new structures' poles will be higher, as shown on mapping in Appendix A. The catenary structures are contributing resources to the NRHP-eligible Pennsylvania Railroad Main Line (Philadelphia to Harrisburg). Appendix A figures show the project area and the locations of the catenary structures re-designed in 2016 to avoid trimming trees beyond the Amtrak right-of-way. Appendix C shows a comparison of the 2014 and revised 2016 designed pole heights. Tables 2-16 and 2-17 present the results of the effects assessment of the catenary structure removal and replacement on the railroad.

Table 2-16: Results of Application of Definition of Effect for Pennsylvania Railroad Main Line (Philadelphia to Harrisburg)

Definition of Effect	Evaluation
An <i>Effect</i> may occur when there is alteration to the characteristics of a historic property qualifying it for inclusion in or eligibility for the National Register as defined in 36 CFR 800.16(i).	The proposed project will remove and replace 325 catenary structures within the ROW along a 16-mile-long section between 51st Street in Philadelphia and the Paoli Substation. The structures are Contributing Resources to the NRHP-eligible property. The proposed project also will cause the Bryn Mawr Substation building to be demolished and replaced with a new substation complex. The proposed project will alter the characteristics that qualify the historic district for listing

Definition of Effect	Evaluation
	in the NRHP.
Finding	The proposed project will have an <i>Effect</i> on Pennsylvania Railroad Main Line (Philadelphia to Harrisburg), resulting in a finding of <i>Historic Properties Affected</i> . Pursuant to 36 CFR Part 800.11(e) the Criteria of Adverse Effect must be applied.

Table 2-17: Results of Application of Criteria of Adverse Effect for Pennsylvania Railroad Main Line (Philadelphia to Harrisburg)

Criteria of Adverse Effect	Evaluation
<i>Adverse effects on historic properties include, but may not be limited to:</i>	
(i) Physical destruction of or damage to all or part of a property	The proposed project will cause the removal of 325 catenary structures between 51 st Street and the Paoli Substation. It will also cause the demolition of the Bryn Mawr Substation, resulting in the physical destruction of two of the property’s Contributing Resources.
(ii) Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation, and provision for handicapped access that is not consistent with the Secretary’s Standards for the Treatment of Historic Properties (36 CFR Part 68) and applicable guidelines	The removal of the catenary structures and the Bryn Mawr Substation will cause alterations to the property that are not consistent with the Secretary’s Standards for the Treatment of Historic Properties (36 CFR Part 68) and applicable guidelines.
(iii) Removal of the property from its historic location	The proposed project will cause the removal of the catenary structures and the Bryn Mawr Substation from their historic locations.
(iv) Change of the character of the property’s use or of physical features within the property’s setting that contribute to its historic significance	The proposed project will not change the character of the railroad’s use. The project will change the character of the physical features within the historic property’s setting. The changes in the character will be minimal, however. The change of the catenary structures, including the addition of higher poles, within the railroad’s setting will not be incompatible with the current setting. Catenary structures have historically been a part of the railroad’s setting and operation, and a change in the current structures to higher ones will not affect the property’s setting and the property’s ability to convey historic significance.

Criteria of Adverse Effect	Evaluation
(v) Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features	The installation of the new and higher catenary structures will introduce new visual elements; however they will not be incompatible with the resource and will not diminish the overall integrity of the railroad and its significant features. The tree trimming will not introduce visual elements that will diminish the integrity of the property's significant historic features. The proposed project will, however, introduce a new substation that will diminish the integrity of the setting and feeling of the property at Bryn Mawr. The proposed project will introduce incompatible audible and vibration elements; however, they will be of a temporary nature and will cease upon project completion.
(vi) Neglect of a property, which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization	The proposed project will not result in the neglect or deterioration of the historic railroad as a whole, but instead will improve the railroad and its operation.
(vii) Transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance	The proposed project will not result in the transfer, lease, or sale of the Pennsylvania Railroad Main Line (Philadelphia to Harrisburg) section.
Finding	The proposed project will have an <i>Adverse Effect</i> on the Pennsylvania Railroad Main Line (Philadelphia to Harrisburg) section.

3.0 SUMMARY

This addendum presents the results of a re-assessment of effects resulting from the redesign of the catenary structures and pole heights at or near the locations of seven (7) historic properties, including the railroad.

Table 3-1: Historic Properties Re-Assessed for Effects

No.	Name of Resource and Key No.	Location (Municipality and County)	NRHP Status	NRHP Criterion & Area(s) of Significance	Results of Effects Assessment
8	Merion Station (Key No. 097341)	Lower Merion Township, Montgomery County	Eligible	Criterion A - Transportation Criterion C - Architecture	No Adverse Effect
9	Wynnewood Station (Key No. 097340)	Lower Merion Township	Eligible	Criterion A - Transportation Criterion C - Architecture	No Historic Properties Affected
13	Villanova University Campus (Key No. 105136)	Radnor Township, Delaware County	Eligible	Criterion A - Education & Criterion C - Architecture	No Adverse Effect
20	Strafford Station (Key No. 079668)	Tredyffrin Township, Chester County	Listed	Criterion A - Transportation Criterion C - Architecture	No Adverse Effect
21	Cramond (Key No. 050893)	Tredyffrin Township, Chester County	Listed	Criterion C - Architecture	No Historic Properties Affected
22	Grove Avenue Service Station (Key No. 112814)	Tredyffrin Township, Chester County	Eligible	Criterion A - Transportation Criterion C - Architecture	No Historic Properties Affected
24	Pennsylvania Railroad Main Line (Philadelphia to Harrisburg) (Key No. 105675)	City of Philadelphia, Narberth Borough, and Easttown, Haverford, Lower Merion, Radnor, and Tredyffrin Townships, Philadelphia, Montgomery, Delaware, and Chester Counties.	Eligible	Criterion A - Transportation & Economics Criterion C - Engineering	Adverse Effect

The re-assessment of effects for seven (7) historic properties for the Amtrak Philadelphia Zoo to Paoli Electrification Transmission Project yields the same finding as the first Determination of Effects assessment—that the project will have an **Adverse Effect** on historic properties, because of the adverse effect on the Pennsylvania Railroad Main Line (Philadelphia to Harrisburg) (Key No. 105675). The following summary and Table 3-2 reiterate the findings from the original Determination of Effects Report; no findings of effect have changed as a result of the redesign and increase in height of certain catenary poles in the APE.

- The proposed project will have an Adverse Effect on one (1) historic property;
- The proposed project will have No Adverse Effect on 10 historic properties; and
- A finding of No Historic Properties Affected has been found for 17 historic properties.

Table 3-2: Historic Properties in APE Assessed for Effects

No.	Name of Resource and Key No.	Location (Municipality and County)	NRHP Status	NRHP Criterion & Area(s) of Significance	Results of Effects Assessment
1	Fairmount Park Historic District (Key No. 001364)	City of Philadelphia, Philadelphia County.	Listed	Criterion C - Architecture, Community Planning, Conservation, Landscape Architecture, & Art	No Historic Properties Affected
2	40th Street Bridge over Amtrak (BMS 67730102400122) (Key No. 137498)	City of Philadelphia, Philadelphia County	Eligible	Criterion A - Transportation Criterion C - Engineering	No Historic Properties Affected
3	42nd Street Bridge over Amtrak (BMS 67730102700125) (Key No. 102489)	City of Philadelphia, Philadelphia County	Eligible	Criterion A - Transportation Criterion C - Engineering	No Historic Properties Affected
4	Parkside Historic District (Key No. 064342)	City of Philadelphia, Philadelphia County	Listed	Criterion C - Architecture & Community Planning	No Historic Properties Affected
5	Belmont Avenue Historic District (Key No. 097543)	City of Philadelphia, Philadelphia County	Eligible	Criterion C - Architecture	No Historic Properties Affected
6	Overbrook Farms Historic District (incl. Overbrook Station) (Key No. 082616)	City of Philadelphia, Philadelphia County	Listed	Criterion C - Architecture & Community Planning	No Adverse Effect
7	SR 1 Bridge over Amtrak (BMS 67000100301217) (Key No. 137615)	City of Philadelphia and Lower Merion Township, Philadelphia and Montgomery Counties	Eligible	Criterion A - Transportation Criterion C - Engineering	No Historic Properties Affected
8	Merion Station (Key No. 097341)	Lower Merion Township, Montgomery County	Eligible	Criterion A - Transportation Criterion C - Architecture	No Adverse Effect
9	Wynnewood Station (Key No. 097340)	Lower Merion Township	Eligible	Criterion A - Transportation Criterion C - Architecture	No Historic Properties Affected
10	Ardmore Commercial Historic District (Key No. 097509)	Lower Merion Township	Eligible	Criterion C - Architecture	No Historic Properties Affected
11	Haverford Station (Key No. 079593)	Lower Merion Township	Eligible	Criterion A - Transportation Criterion C - Architecture	No Adverse Effect
12	Our Mother of Good Counsel Roman Catholic Church (Key No. 097325)	Lower Merion Township	Eligible	Criterion C - Architecture	No Adverse Effect
13	Villanova University Campus (Key No. 105136)	Radnor Township, Delaware County	Eligible	Criterion A - Education & Criterion C - Architecture	No Adverse Effect

No.	Name of Resource and Key No.	Location (Municipality and County)	NRHP Status	NRHP Criterion & Area(s) of Significance	Results of Effects Assessment
14*	Villanova Station (Key No. 827801)	Radnor Township, Delaware County	Eligible only as contri- buting to Resource 24	Criterion A - Transportation & Education	No Adverse Effect
15	Radnor Station (Key No. 101246)	Radnor Township, Delaware County	Eligible	Criterion A - Transportation Criterion C - Architecture	No Adverse Effect
16	Louella Court Historic District (Key No. 128860)	Radnor Township, Delaware County	Eligible	Criterion C - Architecture & Community Planning	No Historic Properties Affected
17	Wayne Station (Key No. 106136)	Radnor Township, Delaware County	Listed	Criterion A - Transportation Criterion C - Architecture	No Adverse Effect
18	North Wayne Historic District (Key No. 064497)	Radnor Township, Delaware County	Listed	Criterion C - Architecture & Community Planning	No Historic Properties Affected
19	Downtown Wayne Historic District (Key No. 827766)	Radnor Township, Delaware County	Listed	Criterion C - Architecture	No Historic Properties Affected
20	Strafford Station (Key No. 079668)	Tredyffrin Township, Chester County	Listed	Criterion A - Transportation Criterion C - Architecture	No Adverse Effect
21	Cramond (Key No. 050893)	Tredyffrin Township, Chester County	Listed	Criterion C - Architecture	No Historic Properties Affected
22	Grove Avenue Service Station (Key No. 112814)	Tredyffrin Township, Chester County	Eligible	Criterion A - Transportation Criterion C - Architecture	No Historic Properties Affected
23	Pennsylvania Railroad (Philadelphia to Morrisville/New York) (Key No. 125733)	City of Philadelphia, Philadelphia County	Eligible	Criterion A - Transportation & Economics; Criterion C - Engineering	No Historic Properties Affected
24	Pennsylvania Railroad Main Line (Philadelphia to Harrisburg) (Key No. 105675)	City of Philadelphia, Narberth Borough, and Easttown, Haverford, Lower Merion, Radnor, and Tredyffrin Townships, Philadelphia, Montgomery, Delaware, and Chester Counties.	Eligible	Criterion A - Transportation & Economics; Criterion C - Engineering	Adverse Effect
25	Philadelphia & Western Railroad (Norristown High Speed Line) (Key No. 128825)	Radnor Township, Delaware County	Eligible	Criterion A - Transportation	No Adverse Effect
26	William Penn Mile Markers (only Ardmore marker out	Lower Merion Township, Montgomery County	Eligible	Criterion A - Transportation	No Historic Properties Affected

No.	Name of Resource and Key No.	Location (Municipality and County)	NRHP Status	NRHP Criterion & Area(s) of Significance	Results of Effects Assessment
	of 12 total is within the APE) (Key No. 101320)				
27	Clonmel-Rosslevyn (Key No. 065460)	Tredyffrin Township, Chester County	Eligible	Criterion C – Architecture	No Historic Properties Affected
28	Devereux Foundation (Key No. 201351)	Easttown Township, Chester County	Eligible	Criterion A – Education Criterion B – Association with Helen Trafford Devereux	No Historic Properties Affected

**Retained in this table to maintain consistency with prior reports.*

4.0 REFERENCES

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2015a *Determination of Effects Report, Zoo to Paoli Electrification Transmission Line Project, Chester, Delaware, Montgomery, and Philadelphia Counties, Pennsylvania*. ER Number 2012-0005-042. Stell Environmental, Elverson, Pennsylvania. Submitted to Amtrak and The Burns Group, Philadelphia.

2015b *Historic Resources Study Zoo to Paoli Electrification Transmission Line Project, Chester, Delaware, Montgomery, and Philadelphia Counties, Pennsylvania*. ER Number 2012-0005-042. Dated February 2015. Prepared by Stell Environmental, Elverson, Pennsylvania. Submitted to Amtrak and The Burns Group, Philadelphia.

2015c *Historic Resources Study Zoo to Paoli Electrification Transmission Line Project, Chester, Delaware, Montgomery, and Philadelphia Counties, Pennsylvania*. ER Number 2012-0005-042. Dated June 2015. Update of February 2015 report. Prepared by Stell Environmental, Elverson, Pennsylvania. Submitted to Amtrak and The Burns Group, Philadelphia.

APPENDIX A
FIGURES

Completed by: GDD on 2/26/2015 G:\Projects\1123_Zoo to Paoli\Technology\Map Docs\Figure 1 General Project Location.mxd Credits: ArcUSA, US Census, ESRI, National Atlas of the United States

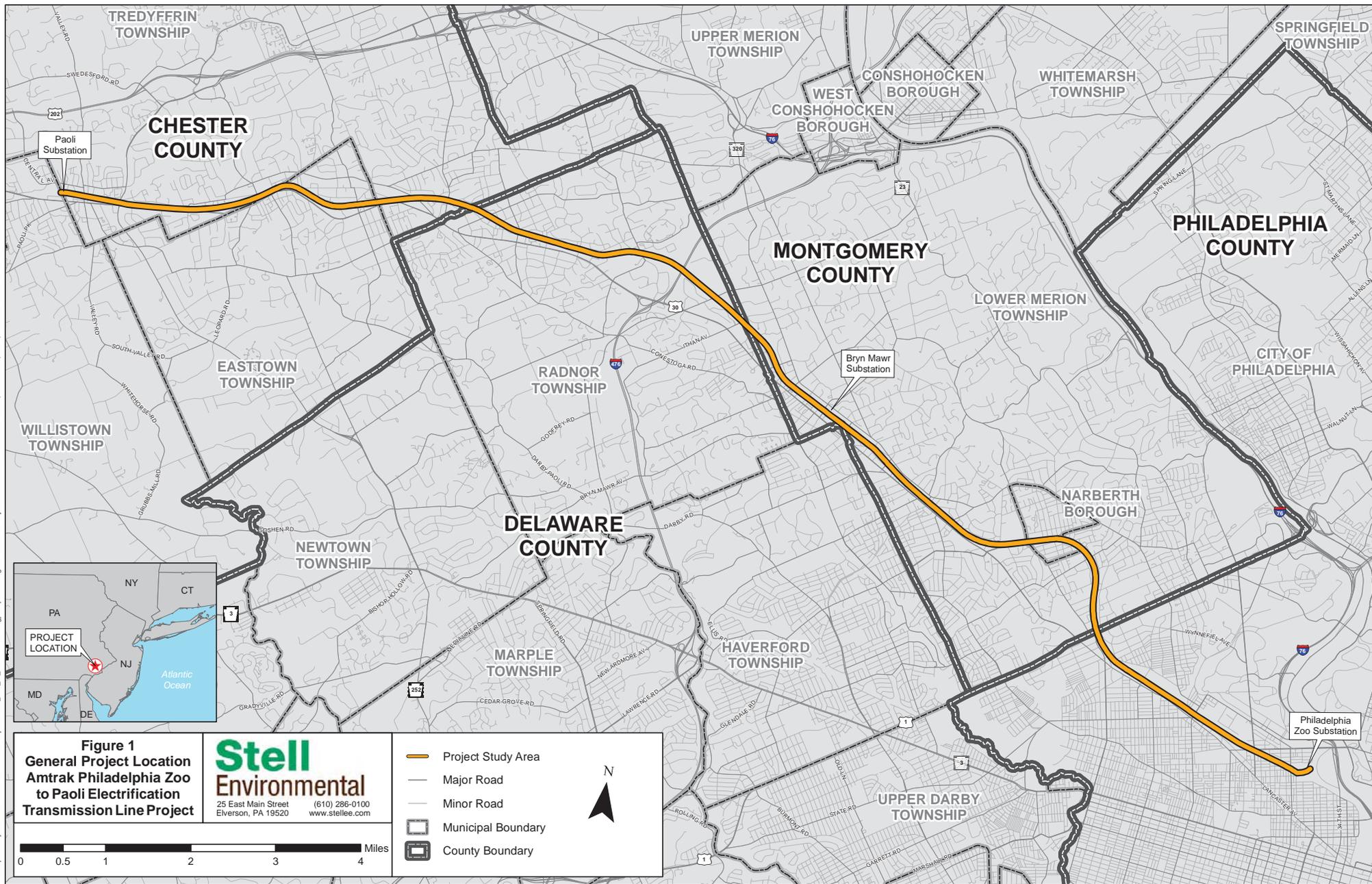
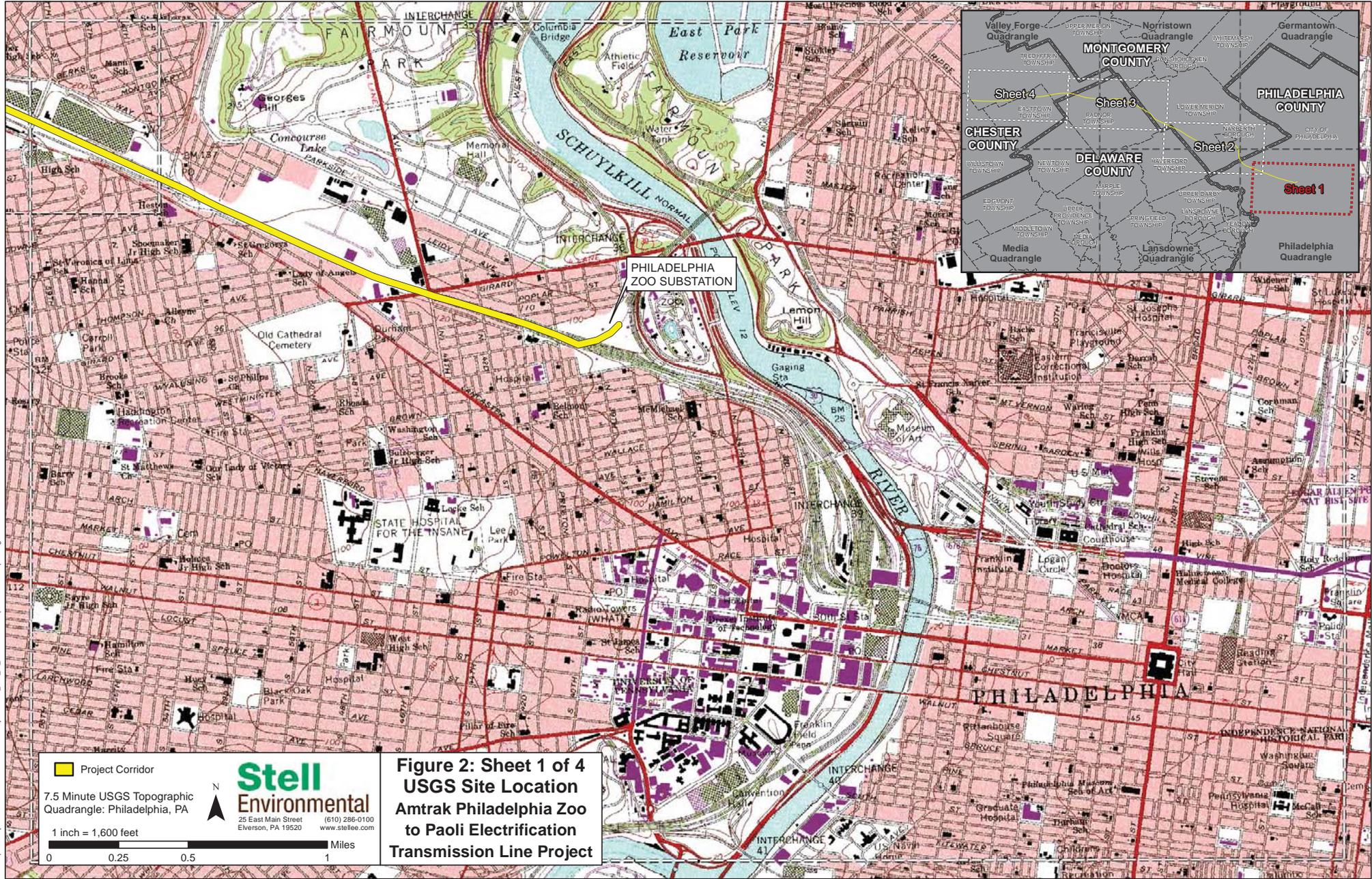


Figure 1
General Project Location
Amtrak Philadelphia Zoo
to Paoli Electrification
Transmission Line Project

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- Project Study Area
- Major Road
- Minor Road
- Municipal Boundary
- County Boundary



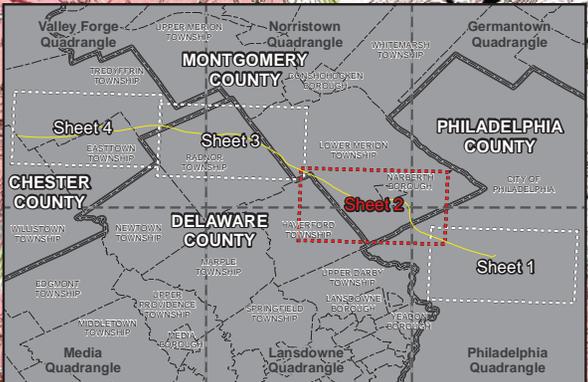
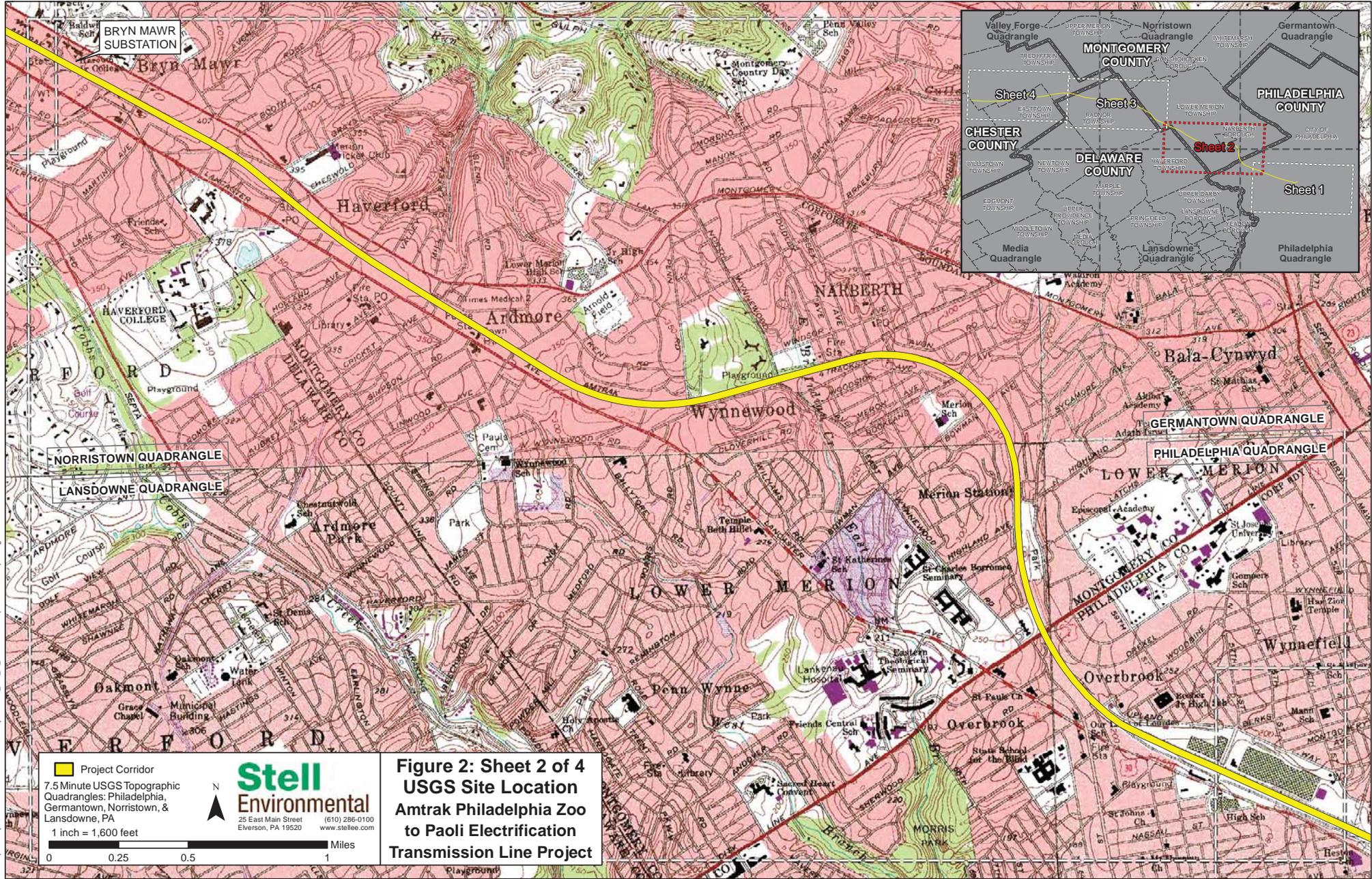


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7.5 Minute USGS Topographic Quadrangle: Philadelphia, PA
 1 inch = 1,600 feet
 0 0.25 0.5 1 Miles

Figure 2: Sheet 1 of 4 USGS Site Location Amtrak Philadelphia Zoo to Paoli Electrification Transmission Line Project

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Project Corridor

7.5 Minute USGS Topographic Quadrangles: Philadelphia, Germantown, Norristown, & Lansdowne, PA

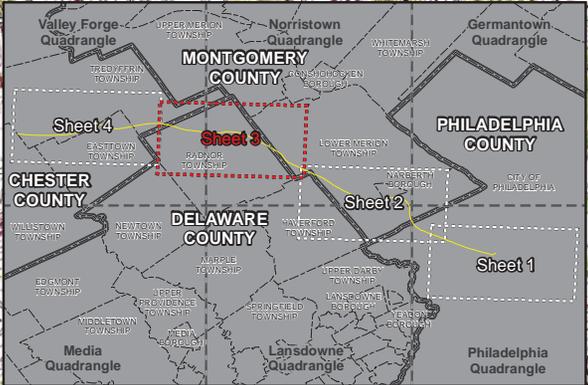
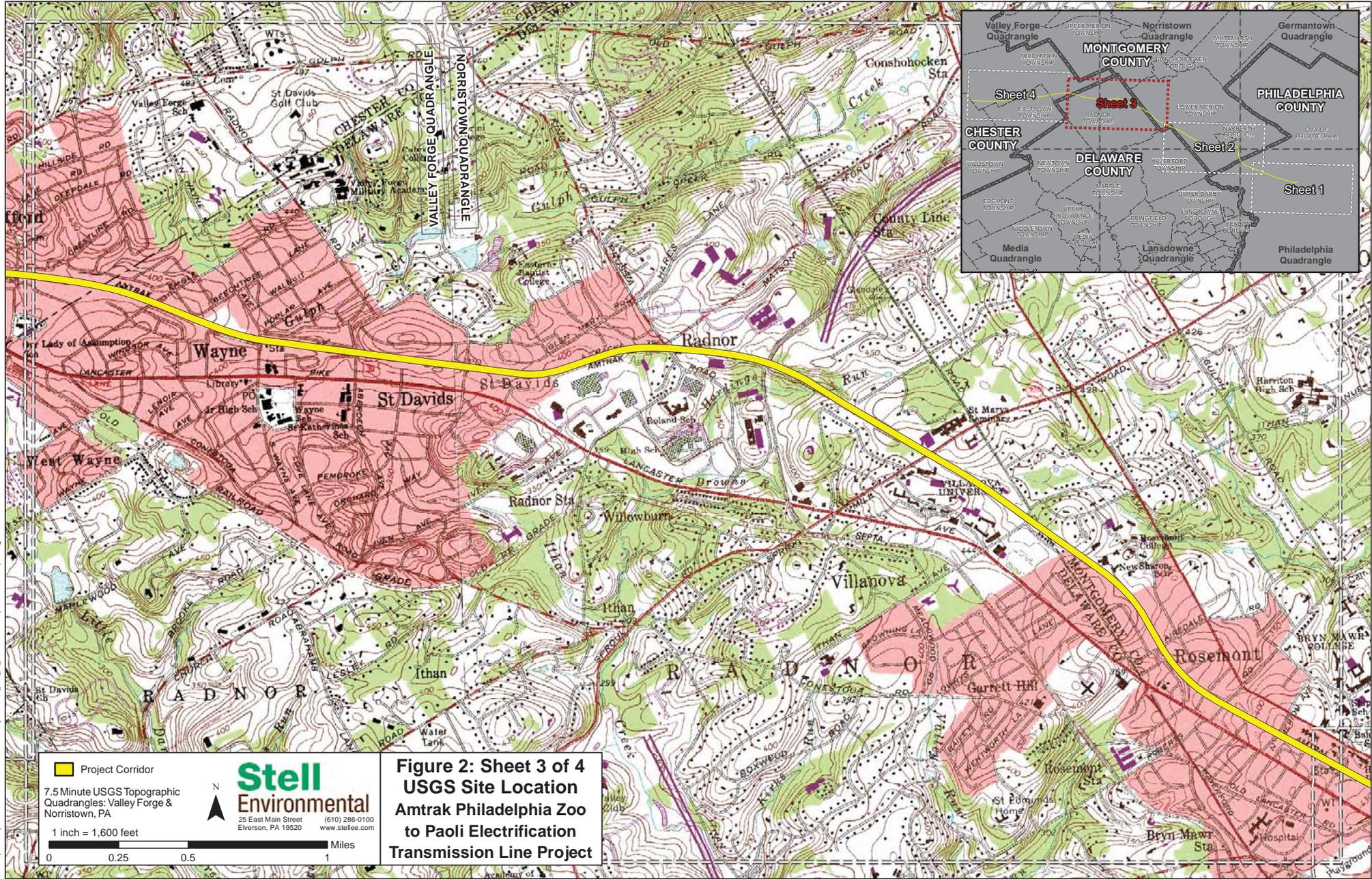
1 inch = 1,600 feet

0 0.25 0.5 1 Miles

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Figure 2: Sheet 2 of 4 USGS Site Location Amtrak Philadelphia Zoo to Paoli Electrification Transmission Line Project

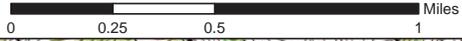
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 Completed by: JBD on 3/26/2015



 Project Corridor

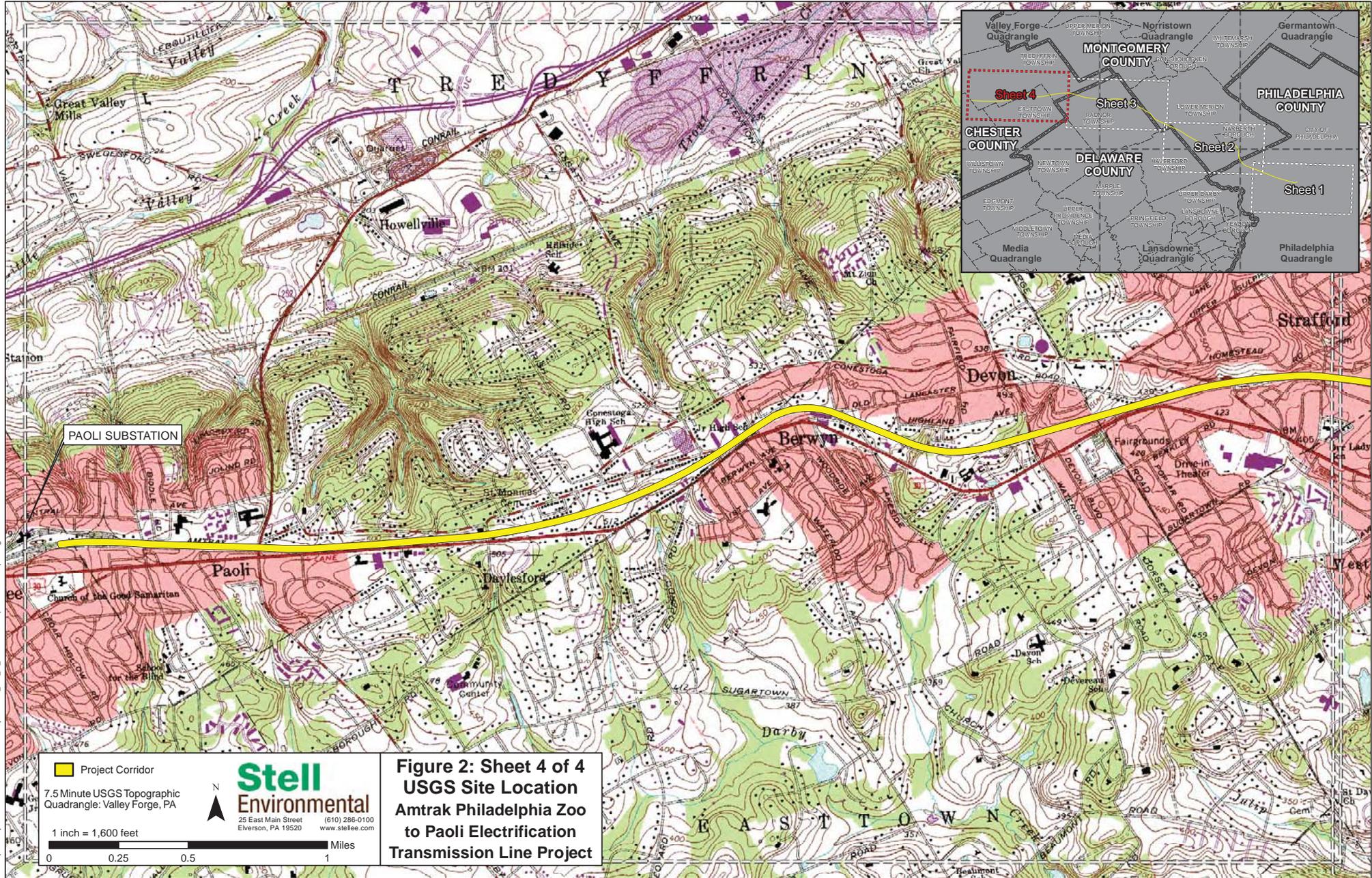
7.5 Minute USGS Topographic
Quadrangles: Valley Forge &
Norristown, PA

1 inch = 1,600 feet



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**Figure 2: Sheet 3 of 4
USGS Site Location
Amtrak Philadelphia Zoo
to Paoli Electrification
Transmission Line Project**

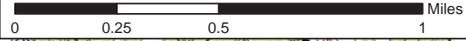


PAOLI SUBSTATION

Project Corridor

7.5 Minute USGS Topographic
Quadrangle: Valley Forge, PA

1 inch = 1,600 feet



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**Figure 2: Sheet 4 of 4
USGS Site Location
Amtrak Philadelphia Zoo
to Paoli Electrification
Transmission Line Project**

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 Source: 2008 PAMAP 11. Unmodified Digital Imagery of Chester, Montgomery, Delaware, & Philadelphia Counties, PA. PADCNR, Bureau of Topographic and Geologic Survey

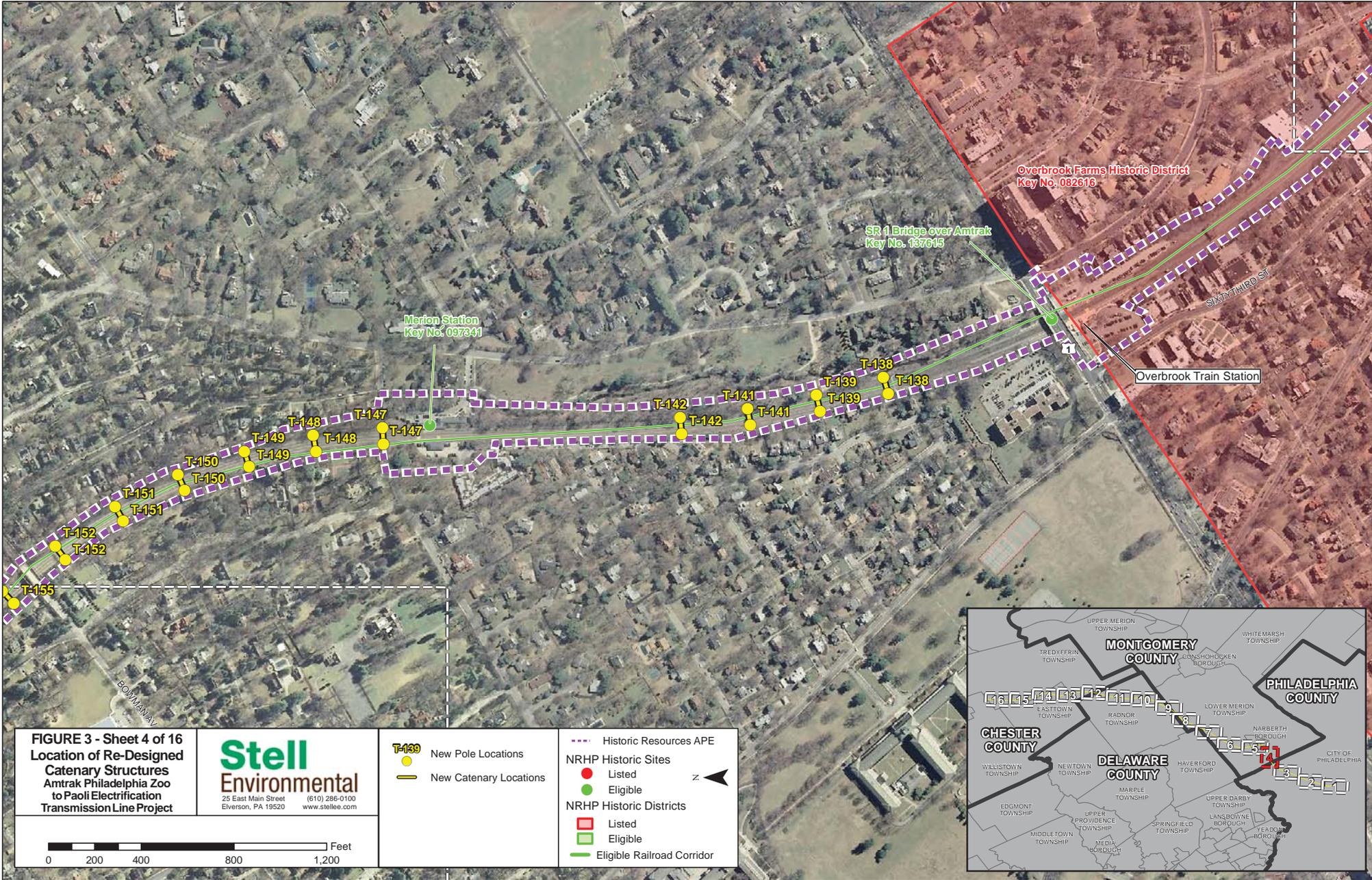
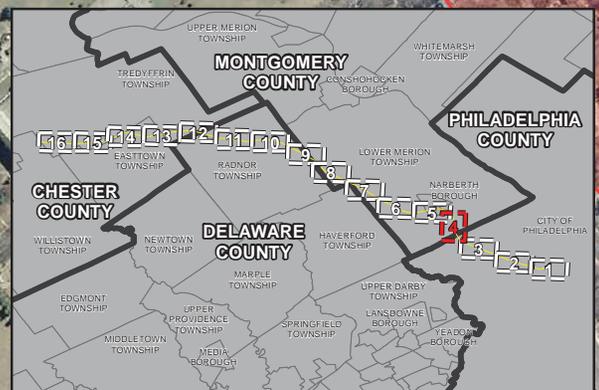
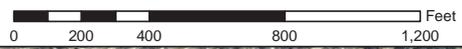


FIGURE 3 - Sheet 4 of 16
Location of Re-Designed
Catenary Structures
Amtrak Philadelphia Zoo
to Paoli Electrification
Transmission Line Project



- T-139 New Pole Locations
- New Catenary Locations

- Historic Resources APE
- NRHP Historic Sites
 - Listed
 - Eligible
- NRHP Historic Districts
 - Listed
 - Eligible
 - Eligible Railroad Corridor



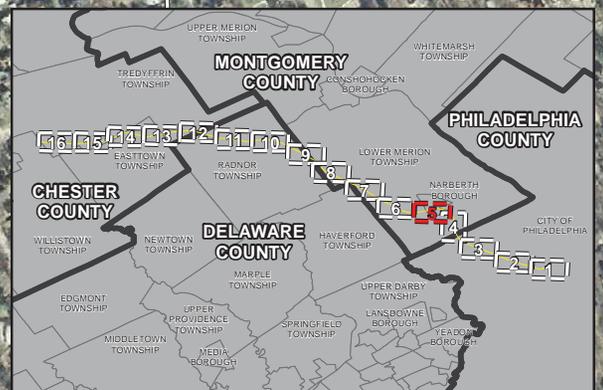
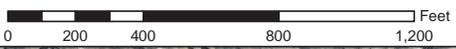
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 Source: 2008 PAIRAP 11. Unlicensed Digital Imagery of Chester, Montgomery, Delaware, & Philadelphia Counties, PA. PADCNR, Bureau of Topographic and Geologic Survey



FIGURE 3 - Sheet 5 of 16
Location of Re-Designed Catenary Structures Amtrak Philadelphia Zoo to Paoli Electrification Transmission Line Project

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- T-189 New Pole Locations
- New Catenary Locations
- Historic Resources APE
- NRHP Historic Sites Listed
- NRHP Historic Sites Eligible
- NRHP Historic Districts Listed
- NRHP Historic Districts Eligible
- Eligible Railroad Corridor



Completed by: Aluleya on 4/22/2016
 Source: 2008 PA MAP 11. Unofficially Digitized Imagery of Chester, Montgomery, Delaware, & Philadelphia Counties, PA. PADCNR, Bureau of Topographic and Geologic Survey
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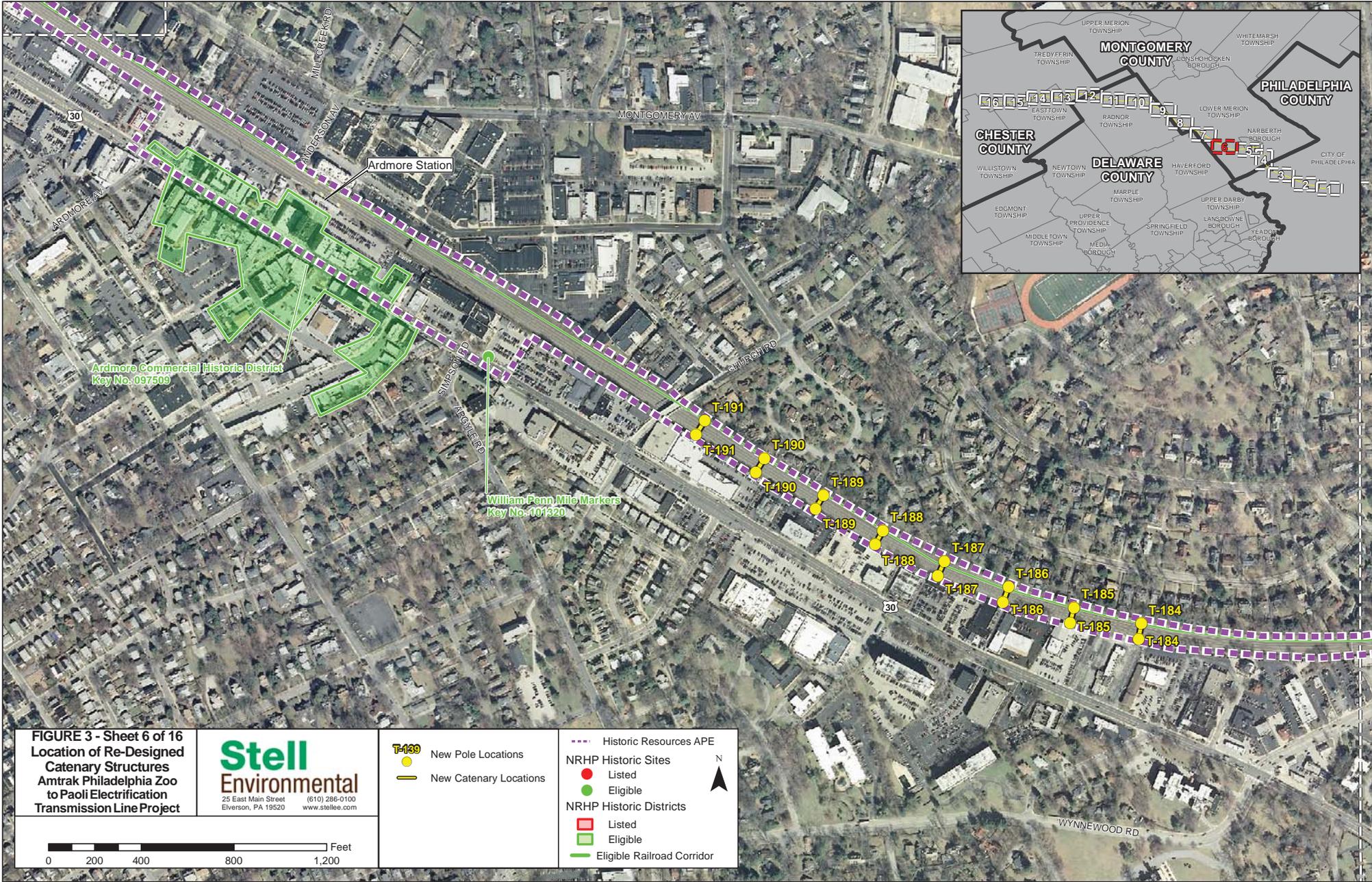


FIGURE 3 - Sheet 6 of 16
Location of Re-Designed Catenary Structures Amtrak Philadelphia Zoo to Paoli Electrification Transmission Line Project

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- T-189 New Pole Locations
- New Catenary Locations
- Historic Resources APE
- NRHP Historic Sites Listed
- NRHP Historic Sites Eligible
- NRHP Historic Districts Listed
- NRHP Historic Districts Eligible
- Eligible Railroad Corridor

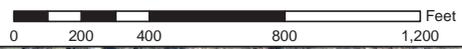


Completed by: Aluleya on 4/22/2016
 Source: 2008 PA/APP 11. Unrestricted Digital Imagery of Chester, Montgomery, Delaware, & Philadelphia Counties, PA. PDCNR, Bureau of Topographic and Geologic Survey
 G:\Projects\1123_Zoo_to_Paoli\MXDs\DOE Report\Figure_3\Figure_3_Sheet 7_Updated APE.mxd



FIGURE 3 - Sheet 7 of 16
Location of Re-Designed
Catenary Structures
Amtrak Philadelphia Zoo
to Paoli Electrification
Transmission Line Project

Stell
Environmental
 25 East Main Street (610) 286-0100
 Elverson, PA 19520 www.stellee.com



- T-139 New Pole Locations
- New Catenary Locations

- - - Historic Resources APE
- NRHP Historic Sites**
- Listed
- Eligible
- NRHP Historic Districts**
- Listed
- Eligible
- Eligible Railroad Corridor



Completed by: Aluleya on 4/22/2016
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 Source: 2008 PAMAP 11. Orthorectified Digital Imagery of Chester, Montgomery, Delaware, & Philadelphia Counties, PA. PADDNR, Bureau of Topographic and Geologic Survey

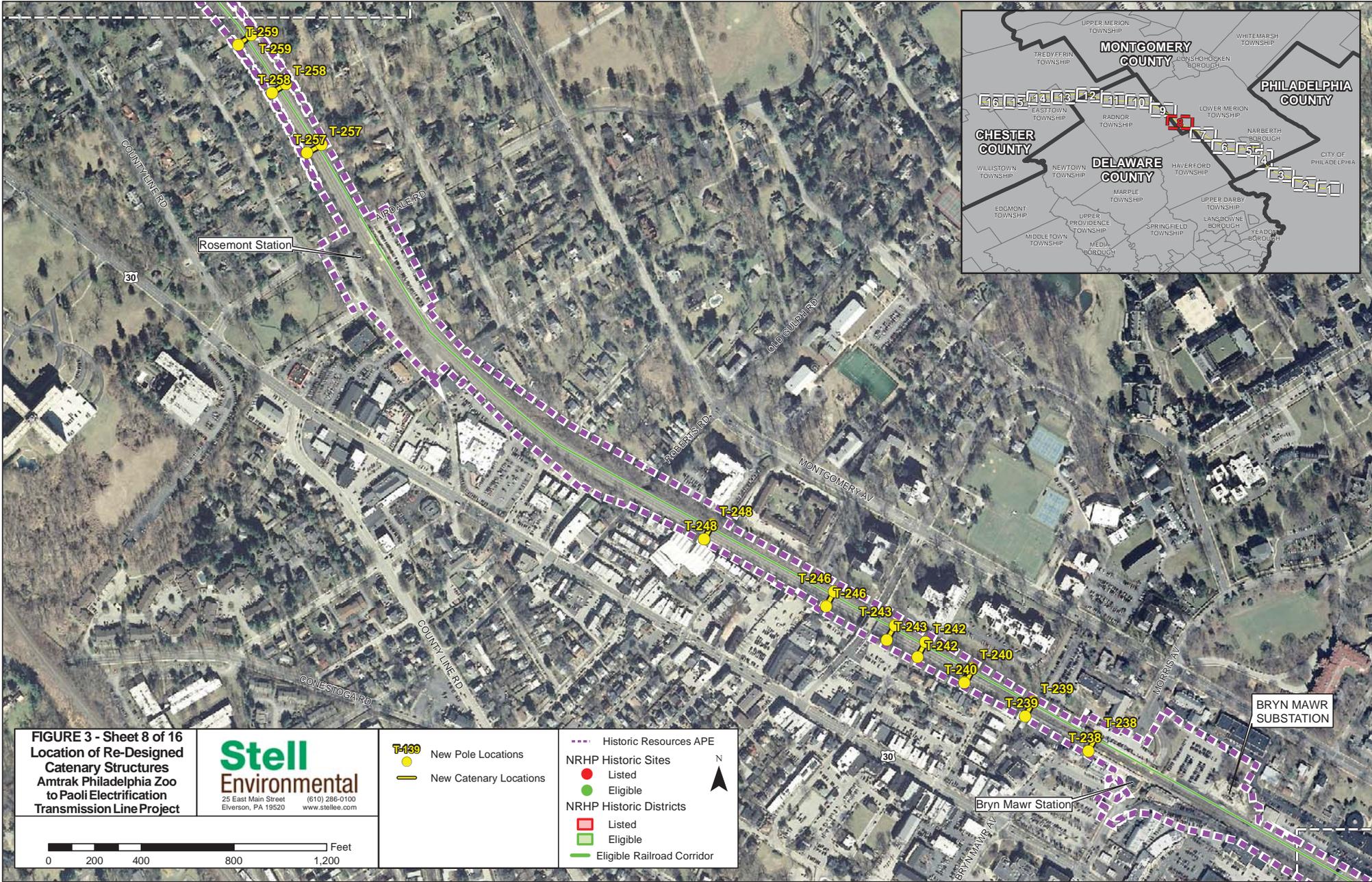
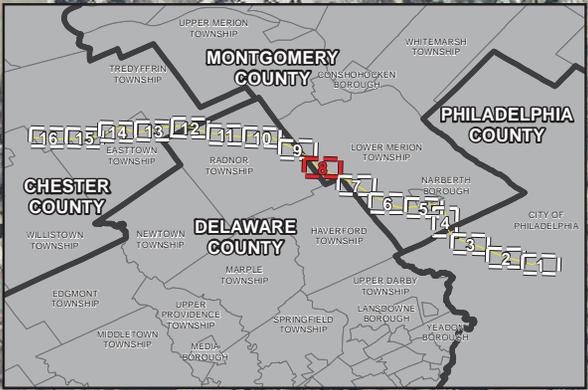
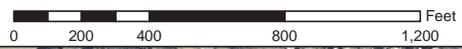


FIGURE 3 - Sheet 8 of 16
Location of Re-Designed
Catenary Structures
Amtrak Philadelphia Zoo
to Paoli Electrification
Transmission Line Project

Stell Environmental
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- T-139 New Pole Locations
- New Catenary Locations

- - - Historic Resources APE
- NRHP Historic Sites**
- Listed
- Eligible
- NRHP Historic Districts**
- Listed
- Eligible
- Eligible Railroad Corridor



BRYN MAWR SUBSTATION

Bryn Mawr Station

Rosemont Station

Completed by: Auleya on 4/22/2016
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 Source: 2008 PA-MAP 11, Unofficially Digitized Imagery of Chester, Montgomery, Delaware, & Philadelphia Counties, PA, PADDNR, Bureau of Topographic and Geologic Survey

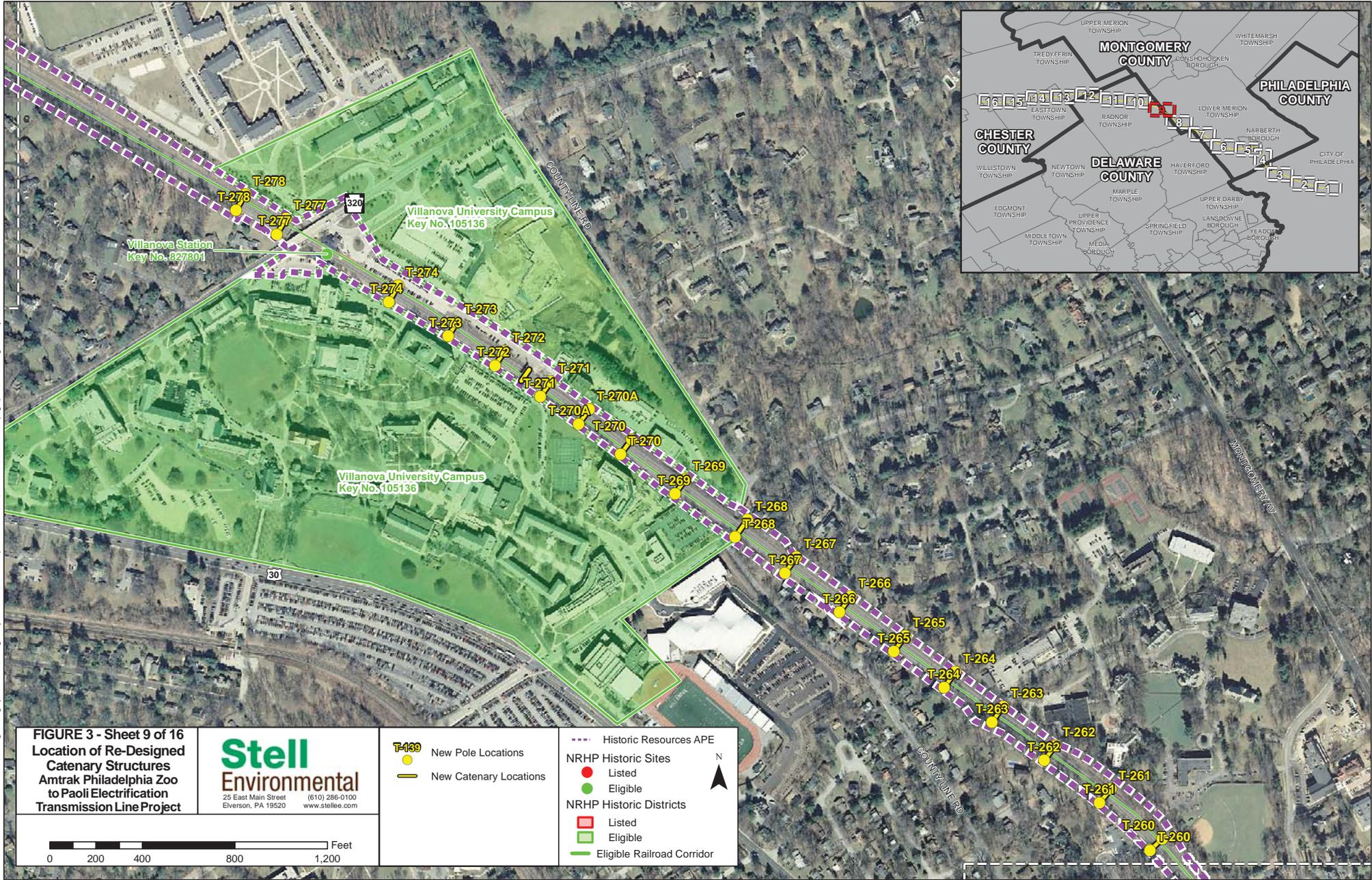
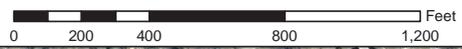


FIGURE 3 - Sheet 9 of 16
Location of Re-Designed Catenary Structures Amtrak Philadelphia Zoo to Paoli Electrification Transmission Line Project

Stell Environmental
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- T-439 New Pole Locations
- New Catenary Locations

- - - Historic Resources APE
- NRHP Historic Sites
 - Listed
 - Eligible
- NRHP Historic Districts
 - Listed
 - Eligible
 - Eligible Railroad Corridor



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 Source: 2008 PA MAP 11. Unofficially Digitized Imagery of Chester, Montgomery, Delaware, & Philadelphia Counties, PA. PADONR, Bureau of Topographic and Geologic Survey

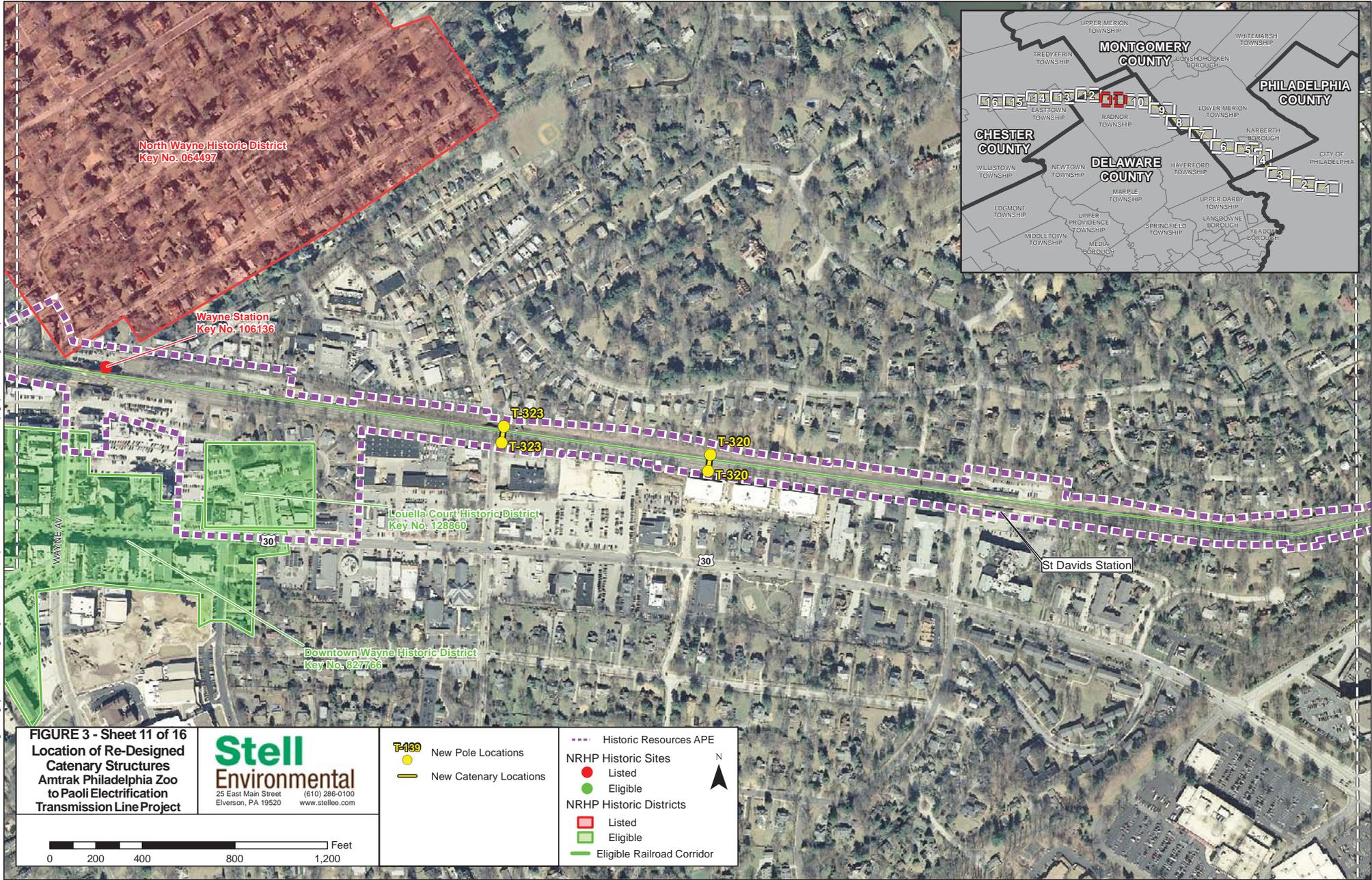


FIGURE 3 - Sheet 11 of 16
Location of Re-Designed
Catenary Structures
Amtrak Philadelphia Zoo
to Paoli Electrification
Transmission Line Project

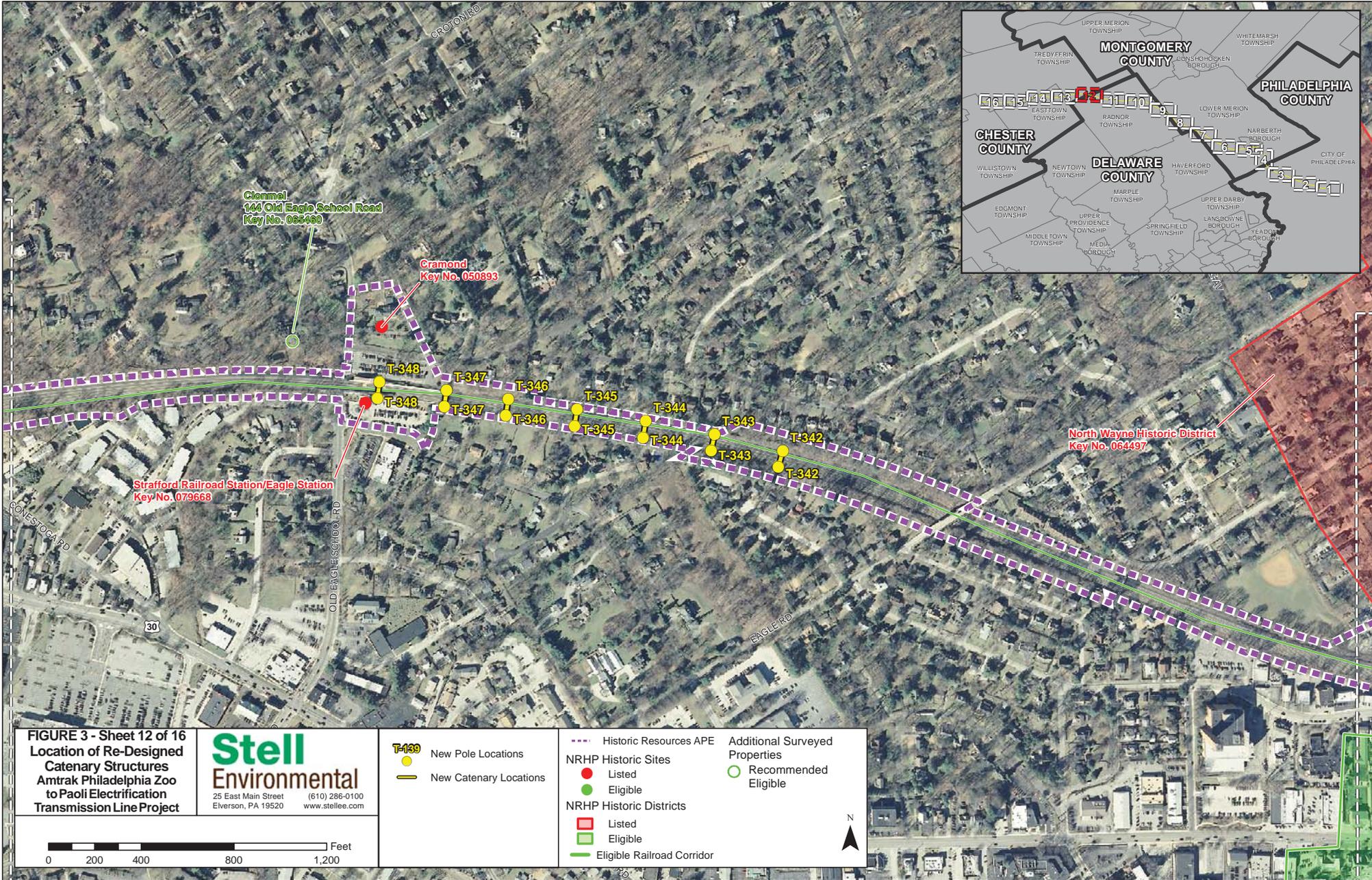
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 Elverson, PA 19520
 (610) 286-0100
 www.stellee.com



- T-439 New Pole Locations
- T-323 New Pole Locations
- T-320 New Pole Locations
- New Catenary Locations
- - - Historic Resources APE
- NRHP Historic Sites Listed
- NRHP Historic Sites Eligible
- NRHP Historic Districts Listed
- NRHP Historic Districts Eligible
- Eligible Railroad Corridor



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 Completed by: Aluleya on 4/22/2016
 Source: 2008 PANAP 11. Unmodified Digital Imagery of Chester, Montgomery, Delaware, & Philadelphia Counties, PA. PADCNR, Bureau of Topographic and Geologic Survey



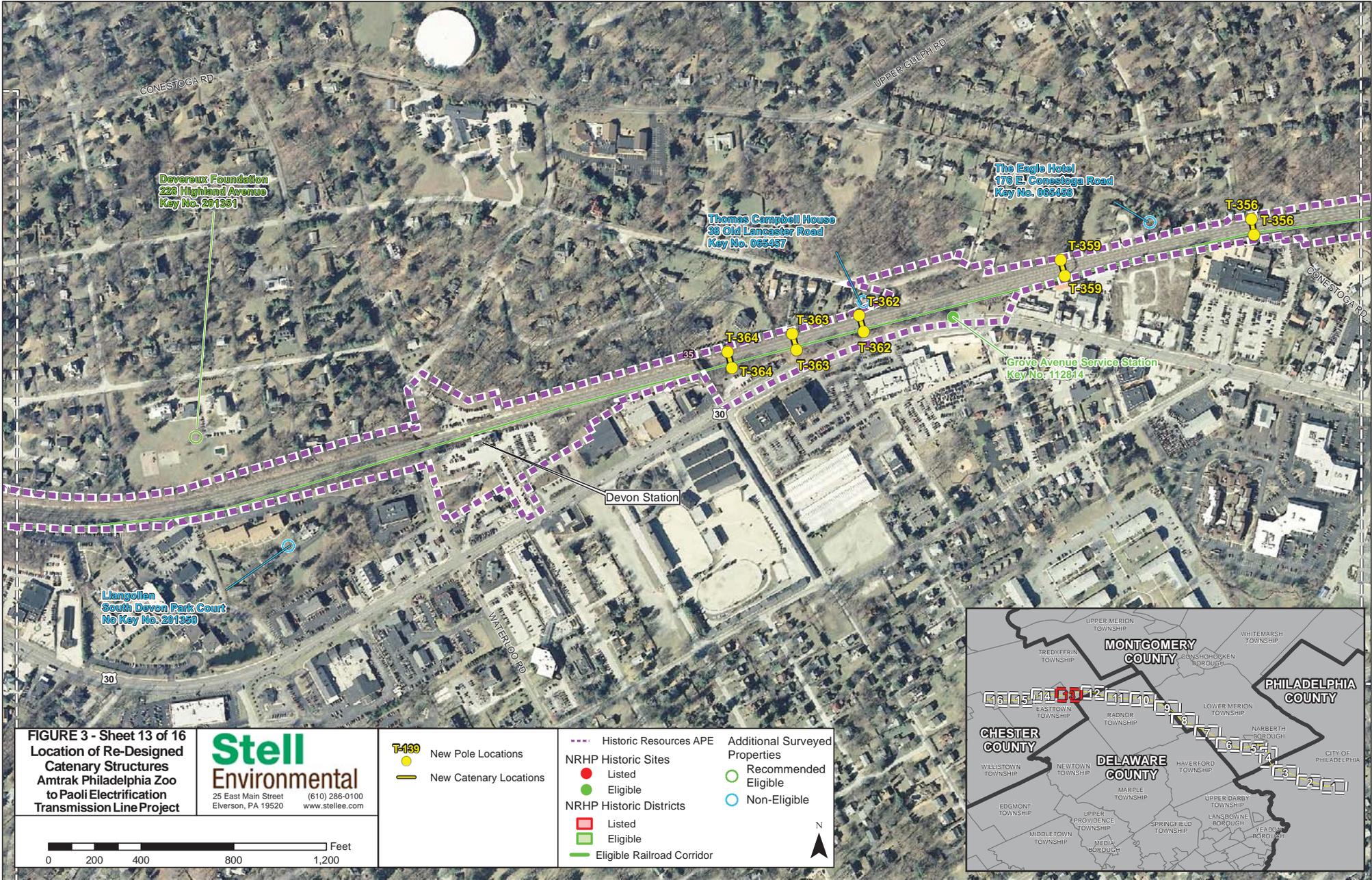


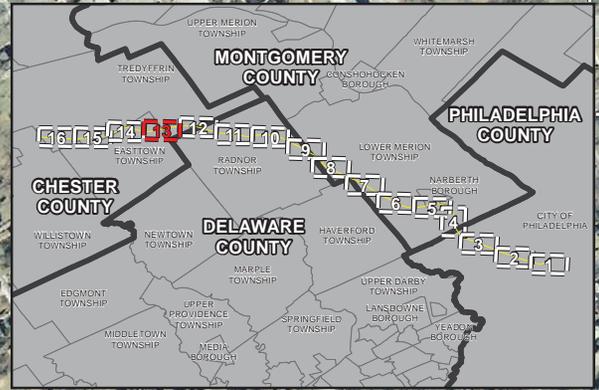
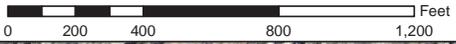
FIGURE 3 - Sheet 13 of 16
Location of Re-Designed Catenary Structures Amtrak Philadelphia Zoo to Paoli Electrification Transmission Line Project

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- T-439 New Pole Locations
- New Catenary Locations

- Historic Resources APE
- NRHP Historic Sites Listed
- NRHP Historic Sites Eligible
- NRHP Historic Districts Listed
- NRHP Historic Districts Eligible
- Eligible Railroad Corridor

- Additional Surveyed Properties
- Recommended Eligible
- Non-Eligible



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 Source: 2008 PAMAP 11. Unmodified Digital Imagery of Chester, Montgomery, Delaware, & Philadelphia Counties, PA. PADCNR, Bureau of Topographic and Geologic Survey

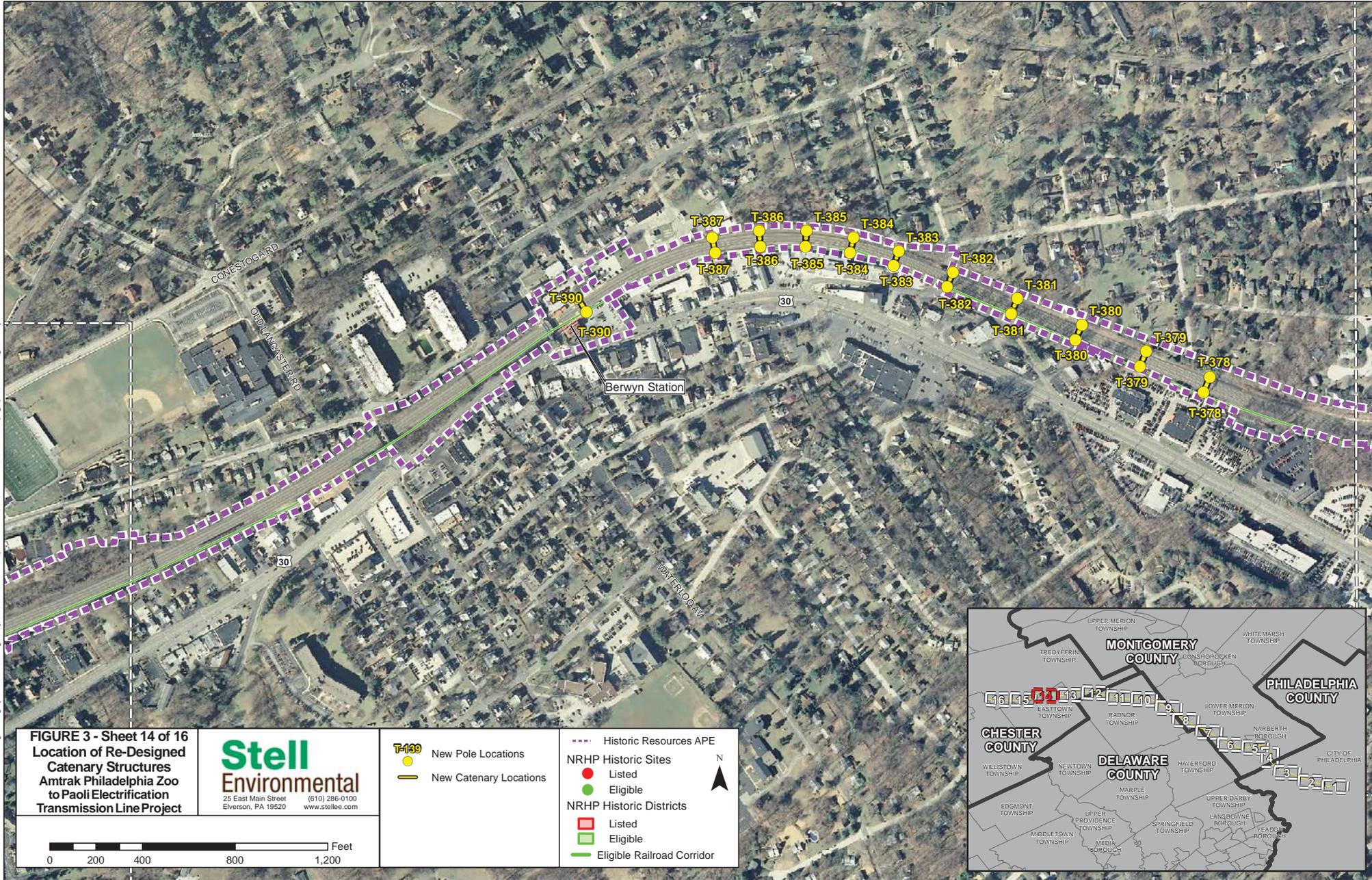
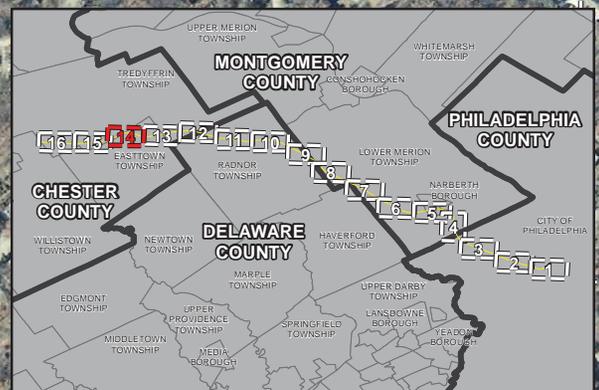
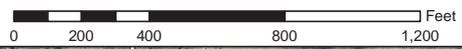


FIGURE 3 - Sheet 14 of 16
Location of Re-Designed Catenary Structures Amtrak Philadelphia Zoo to Paoli Electrification Transmission Line Project

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- T-439 New Pole Locations
- New Catenary Locations
- Historic Resources APE
- NRHP Historic Sites Listed
- NRHP Historic Sites Eligible
- NRHP Historic Districts Listed
- NRHP Historic Districts Eligible
- Eligible Railroad Corridor



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 Completed by: Auleya on 4/22/2016
 Source: 2008 PANAP 11. Unmodified Digital Imagery of Chester, Montgomery, Delaware, & Philadelphia Counties, PA. PADCNR, Bureau of Topographic and Geologic Survey

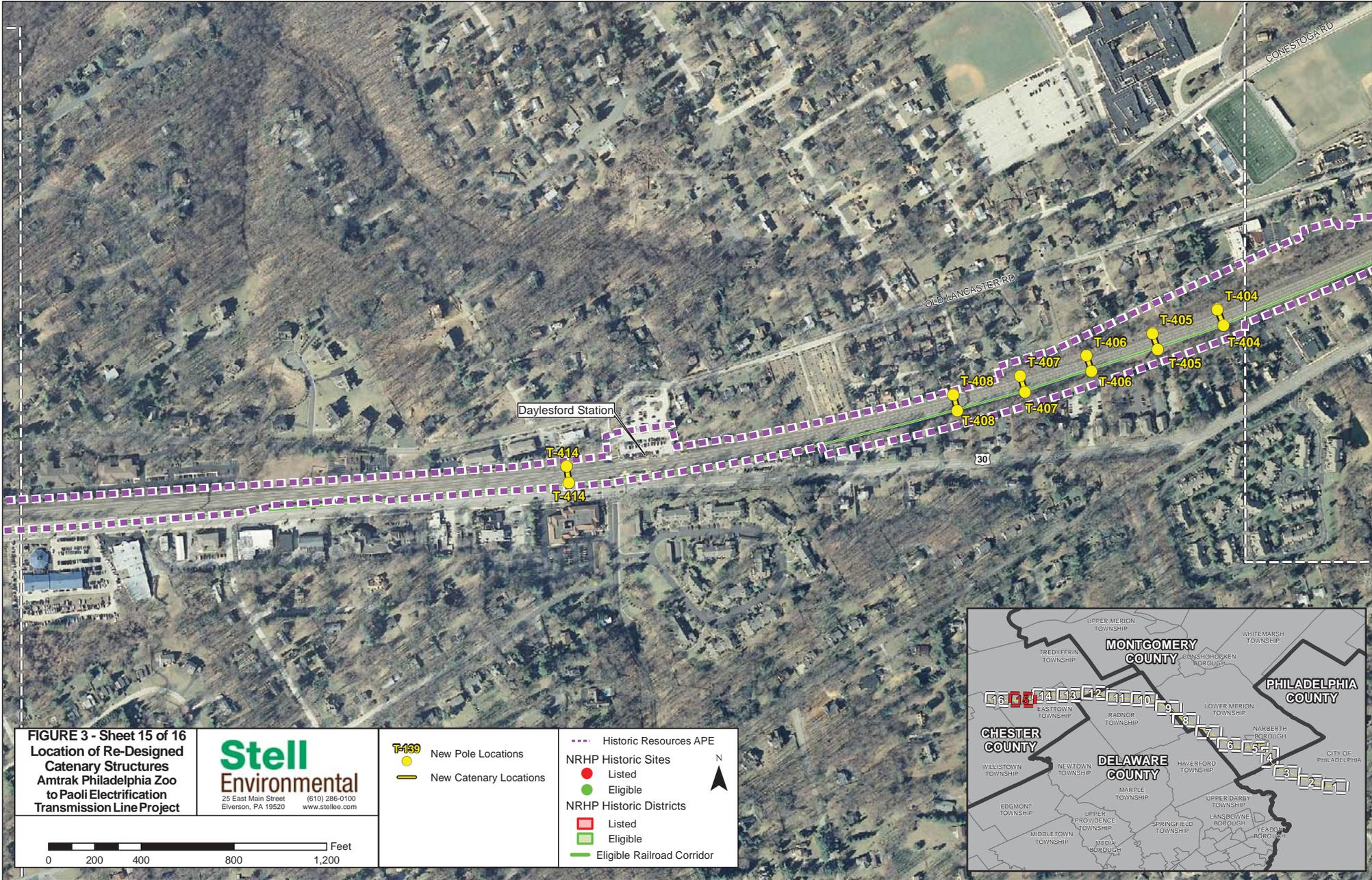
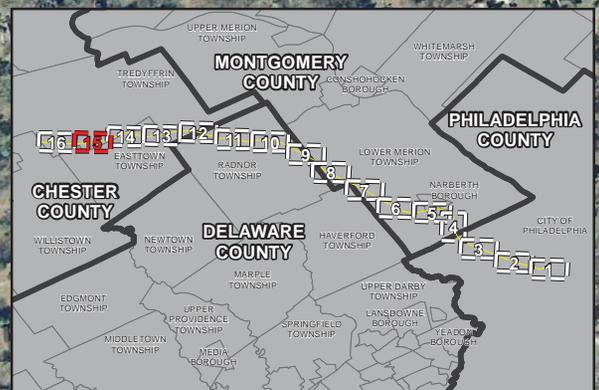


FIGURE 3 - Sheet 15 of 16
Location of Re-Designed
Catenary Structures
Amtrak Philadelphia Zoo
to Paoli Electrification
Transmission Line Project

Stell
Environmental
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- T-439 New Pole Locations
- New Catenary Locations

- Historic Resources APE
- NRHP Historic Sites
- Listed
- Eligible
- NRHP Historic Districts
- Listed
- Eligible
- Eligible Railroad Corridor



Completed by: Auleya on 4/22/2016
 Source: 2008 PA MAP 11. Unofficially Digitized Imagery of Chester, Montgomery, Delaware, & Philadelphia Counties, PA. PADCNR Bureau of Topographic and Geologic Survey

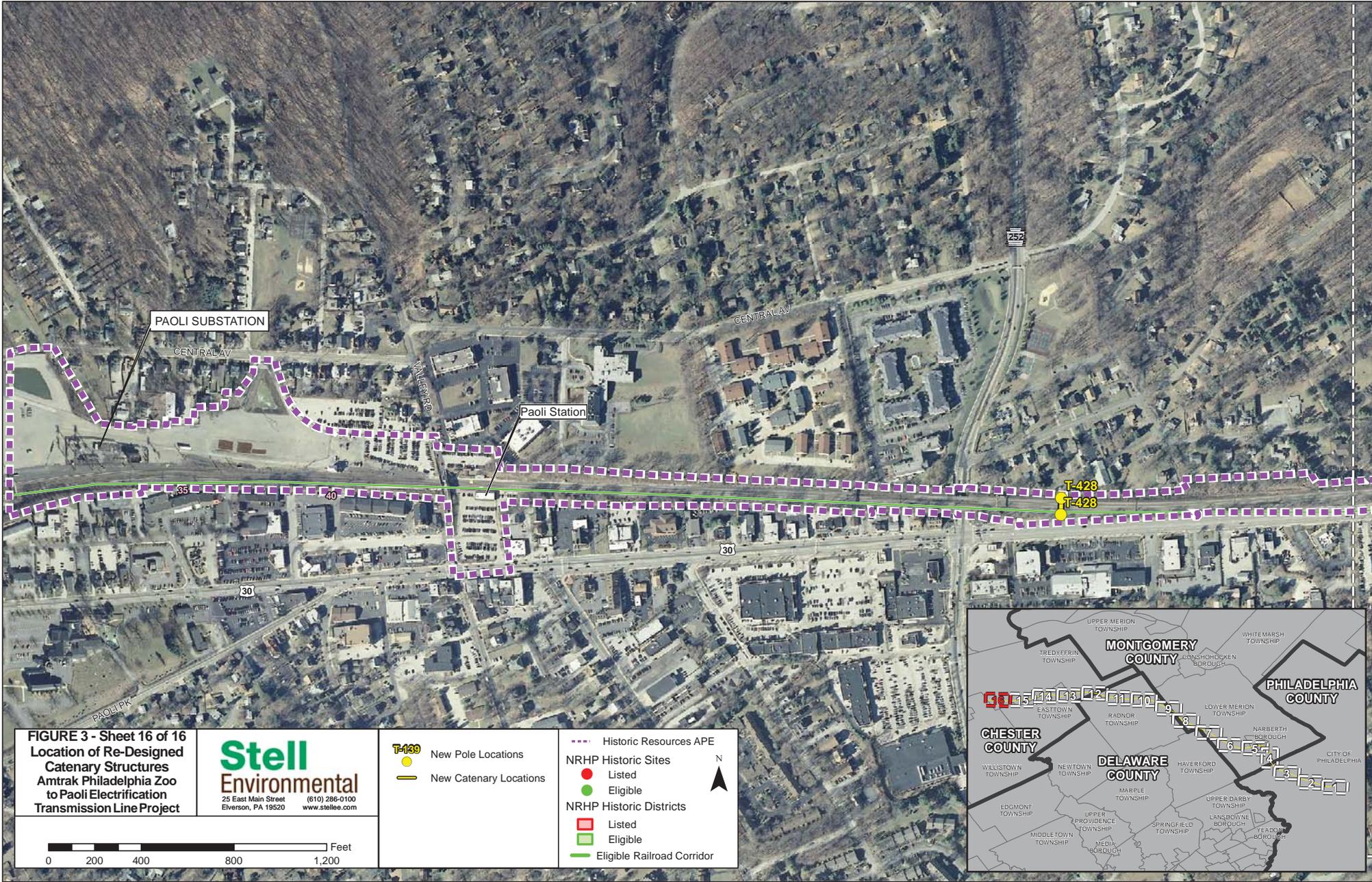
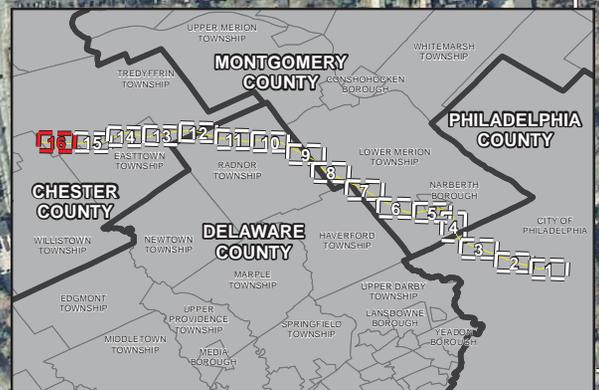
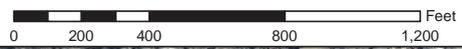


FIGURE 3 - Sheet 16 of 16
Location of Re-Designed
Catenary Structures
Amtrak Philadelphia Zoo
to Paoli Electrification
Transmission Line Project

Stell
Environmental
 25 East Main Street
 Elverson, PA 19520
 (610) 286-0100
 www.stellee.com

- T-439 New Pole Locations
- New Catenary Locations

- Historic Resources APE
- NRHP Historic Sites
 - Listed
 - Eligible
- NRHP Historic Districts
 - Listed
 - Eligible
 - Eligible Railroad Corridor



DRAFT

APPENDIX B
CORRESPONDENCE WITH PA SHPO



Commonwealth of Pennsylvania
Pennsylvania Historical and Museum Commission
Bureau for Historic Preservation
Commonwealth Keystone Building, 2nd Floor
400 North Street
Harrisburg, PA 17120-0093
www.phmc.state.pa.us

16 March 2015

Mr. Allen Heist, PMP
Stell Environmental
25 East Main Street
Elverson, PA 19520

Re: ER 2012-0005-042-N
FRA: Amtrak Zoo to Paoli Electrification Project
Identification of Historic Properties/Determination of
Eligibility

Dear Mr. Heist:

Thank you for submitting information concerning the above referenced project. The Bureau for Historic Preservation (the State Historic Preservation Office) reviews projects in accordance with state and federal laws. Section 106 of the National Historic Preservation Act of 1966, and the implementing regulations (36 CFR Part 800) of the Advisory Council on Historic Preservation, is the primary federal legislation. The Environmental Rights amendment, Article 1, Section 27 of the Pennsylvania Constitution and the Pennsylvania History Code, 37 Pa. Cons. Stat. Section 500 *et seq.* (1988) is the primary state legislation. These laws include consideration of the project's potential effects on both historic and archaeological resources.

We offer the following comments on the identification of historic properties for the above-referenced project.

Historic Structures

Based on the information provided, it is the opinion of the State Historic Preservation Officer that the following properties are **not eligible** for listing in the National Register of Historic Places:

- **Thomas Campbell House (Key No. 065457)** is **not eligible** due to a lack of integrity as a result of the late-20th-century additions and changes.
- **Llanogellen/South Devon Park Apartments (Key No. 201350)** is **not eligible** due to lack of integrity resulting from the ca. 1970 conversion to an apartment complex.

Based on the information provided, it is the opinion of the State Historic Preservation Officer that the following property is **eligible** for listing in the National Register of Historic Places:

- **Clonmel-Rosslevyn (Key No. 065460)** is **eligible** under Criterion C in the area of Architecture for the year ca. 1910. Although the residence may not be the most prominent example along the Main Line, the property conveys architectural significance as a *circa*-1910 Tudor Revival-style residence by the prominent local architects Baily & Bassett. The appropriate boundary may include the gate house and stable historically associated with the property.

We are unable to complete our review of the following properties:

We request additional information for the **Eagle Hotel (Key No. 065458)**. Please provide more detail explaining the additions and renovations to the hotel building, so that we can better understand if it retains the integrity necessary to convey 19th-century significance as an inn or tavern associated with travelers along the turnpike or railroad. Also, assess if the property has any 20th-century significance for its association with the

Rosato family and their medical practices, and whether the current integrity of the property would convey that significance. Provide a site plan sketch that indicates the additions and illustrates the evolution of the building's footprint.

We request additional information for the **Devereux Foundation (Key No. 201351)**. Please provide more information about the development of Helena Devereux's private school and the impact of her programming on the evolution of education for special-needs children in the 20th century, at least to 1960. A biography for Ms. Devereux, *Reaching the Mind, Touching the Spirit*, available at the foundation's website should be a helpful reference: http://www.devereux.org/site/PageServer?pagename=about_helena_trafford_devereux Consider whether changes to the property(ies) as the school developed would fall within a potential period of significance, directly relate to the new function of the buildings, and therefore not compromise overall integrity. We are especially interested in the potential for the facility to be significant under Criterion A, for association with the educational trends for special-needs children, and the potential for Criterion B significance, for association with the productive life of Helena Devereux. We are aware of one other school in Pennsylvania that may be helpful for context, the Melmark School in Delaware County, and there may be others to identify, as well.

If you need further information concerning this review, please contact Emma Diehl at (717) 787-9121.

Sincerely,



Andrea L. MacDonald, Chief
Division of Preservation Services

ALM/ekd



Commonwealth of Pennsylvania
Pennsylvania Historical and Museum Commission
Bureau for Historic Preservation
Commonwealth Keystone Building, 2nd Floor
400 North Street
Harrisburg, PA 17120-0093
www.phmc.state.pa.us

24 April 2015

Patricia H. Baker
Stell Environmental
25 East Main Street
Elverson, PA 19520

Re: ER 2012-0005-042-O
FRA: Amtrak Zoo to Paoli Electrification Project
FedEx Ground Hub and Roadway Improvements
Determination of Eligibility: Additional Information

Dear Ms. Baker:

Thank you for submitting information concerning the above referenced project. The Bureau for Historic Preservation (the State Historic Preservation Office) reviews projects in accordance with state and federal laws. Section 106 of the National Historic Preservation Act of 1966, and the implementing regulations (36 CFR Part 800) of the Advisory Council on Historic Preservation, is the primary federal legislation. The Environmental Rights amendment, Article 1, Section 27 of the Pennsylvania Constitution and the Pennsylvania History Code, 37 Pa. Cons. Stat. Section 500 *et seq.* (1988) is the primary state legislation. These laws include consideration of the project's potential effects on both historic and archaeological resources.

We offer the following comments on the additional information submitted regarding the identification of historic properties for the above-referenced project.

Based on the additional information received, we concur with the preparer that the **Devereux Foundation (Key No. 201351)** is **eligible** for listing in the National Register of Historic Places under Criterion A in the area of Education and under Criterion B for its association with Helena Trafford Devereux. The period of significance begins in 1918, the date Helena Devereux began acquiring the property for use as a school, and extends to 1965, the 50 year age criteria consideration. The boundary would include the existing 7.8-acre parcel, with the existing four buildings considered contributing.

Based on the additional information received, it is the opinion of the State Historic Preservation Officer that the **Eagle Hotel (Key No. 065458)** is **not eligible** for listing in the National Register of Historic Places due to a lack of integrity. If the property does retain significance related to its use as a railroad hotel, it no longer retains integrity to convey any significance from the period of use.

We concur with the scope and level of effort utilized to identify historic properties for this project appropriate pursuant to 36 CFR 800.4. Our determination of eligibility is based upon the information provided and available in our files for review. If National Register designation for this property is sought in the future, additional documentation of the property's significance and integrity may be required to both verify this determination of eligibility and satisfy the requirements of the National Park Service (36 CFR Part 60). Thus, the outcome of the National Register listing process cannot be assured by this determination of eligibility.

2012-0005-042-O

P. Baker

Page 2 of 2

If you need further information concerning this review, please contact Emma Diehl at (717) 787-9121.

Sincerely,



Andrea L. MacDonald, Chief
Division of Preservation Services

ALM/ekd



Commonwealth of Pennsylvania
Pennsylvania Historical and Museum Commission
Bureau for Historic Preservation
Commonwealth Keystone Building, 2nd Floor
400 North Street
Harrisburg, PA 17120-0093
www.phmc.state.pa.us

8 October 2015

David Valenstein
Chief, Environmental and Systems Planning Division
Federal Railroad Administration
1200 New Jersey Avenue SE
Washington DC 20590

Re: 2012-0005-042-R and V
Zoo to Paoli Electrification Transmission Line Upgrade
Chester, Delaware, Montgomery, and Philadelphia Counties

Dear Mr. Valenstein:

Thank you for submitting information concerning the above referenced project. The Bureau for Historic Preservation (the State Historic Preservation Office) reviews projects in accordance with state and federal laws. Section 106 of the National Historic Preservation Act of 1966, and the implementing regulations (36 CFR Part 800) of the Advisory Council on Historic Preservation, is the primary federal legislation. The Environmental Rights amendment, Article 1, Section 27 of the Pennsylvania Constitution and the Pennsylvania History Code, 37 Pa. Cons. Stat. Section 500 *et seq.* (1988) is the primary state legislation. These laws include consideration of the project's potential effects on both historic and archaeological resources.

We are in agreement that the above listed project will adversely affect historic properties due to the removal and replacement of catenary structures and the Bryn Mawr Substation, contributing resources to the Pennsylvania Railroad Main Line (Philadelphia to Harrisburg) (Key No. 105675). We are of the opinion that there has been adequate consultation with our office and the consulting parties regarding ways to avoid, minimize, or mitigate effects on historic properties. We look forward to a review of a draft Memorandum of Agreement that includes the mitigation measures discussed at the September 2, 2015 meeting and outlined in the associated follow up memorandum of September 29, 2015. Finally, to comply with the regulations of the Advisory Council on Historic Preservation, you must follow the procedures outlined in 36 CFR 800.6, when the effect is adverse.

Please contact Barbara Frederick at (717) 772-0921 for further information regarding this review.

Sincerely,

A handwritten signature in black ink, appearing to read "D. McLearn".

Douglas C. McLearn, Chief
Division of Archaeology & Protection

DCM/bcf

cc: Allen Heist, Stell Environmental
Michelle Fishburne, FRA
Johnette Davies, Amtrak

APPENDIX C
COMPARISON OF EXISTING AND REDESIGNED
CATENARY STRUCTURE HEIGHTS WITHIN
PENNSYLVANIA RAILROAD MAIN LINE (PHILADELPHIA TO HARRISBURG)

**Comparison of Existing and Redesigned Catenary Structure Heights within Pennsylvania
Railroad Main Line (Philadelphia to Harrisburg)**

Existing Structures	2014 Design	2016 Design
50'-2"	T-138 - 71'-11" (S) and 71'-11" (N)	T-138 - 74'-11" (S) and 71'-11" (N - remains the same as 2014 design)
50'-2"	T-139 - 68'-1 1/2" (S) and 68'-1 1/2" (N)	T-139 - 78'-1 1/2" (S) and 68'-1 1/2" (N - remains the same as 2014 design)
50'-2"	T-141 - 66'-4 1/4" (S) and 69'-4 1/4" (N)	T-141 - 74'-4 1/4" (S) and 69'-4 1/4" (N - remains the same as 2014 design)
50'-2"	T-142 - 64'-1 1/4" (S) and 56'-1 1/4" (N)	T-142 - 71'-1 1/4" (S) and 56'-1 1/4" (N - remains the same as 2014 design)
50'-2"	T-146 - 75'-2" (S) and 60'-2" (N)	T-146 - remains the same as 2014 design
50'-2"	T-147 - 56'-3/4" (S) and 58'-3/4" (N)	T-147 - 64'-3/4" (S) and 58'-3/4" (N)
50'-2"	T-148 - 56'-10 1/2" (S) and 58'-10 1/2" (N)	T-148 - 64'-10 1/2" (S) and 66'-10 1/2" (N)
50'-2"	T-149 - 59'-9" (S) and 59'-9" (N)	T-149 - 67'-9" (S) and 74'-9" (N)
50'-2"	T-150 - 56'-5 1/4" (S) and 56'-5 1/4" (N)	T-150 - 71'-5 1/4" (S) and 64'-5 1/4" (N)
50'-2"	T-151 - 71'-9" (S) and 71'-9" (N)	T-151 - 86'-9" (S) and 71'-9" (N - remains the same as 2014 design)
50'-2"	T-152- 79'-3 1/4" (S) and 76'-3 1/4" (N)	T-152 - 94'-3 1/4" (S) and 76'-3 1/4" (N - remains the same as 2014 design)
50'-2"	T-155 - 76'-1 3/4" (S) and 76'-1 3/4" (N)	T-155 - 83'-1 3/4" (S) and 76'-1 3/4" (N - remains the same as 2014 design)
50'-2"	T-156 - 67'-0" (S) and 69'-0" (N)	T-156 - 67'-0" (S - remains the same as 2014 design) and 62'-0" (N)
50'-2"	T-179 - 60'-2" (S) and 60'-2" (N)	T-179 - remains the same as 2014 design
50'-2"	T-180 - 58'-6" (S) and 57'-6" (N)	T-180 - 58'-6" (S - remains the same as 2014 design) and 65'-6" (N)
50'-2"	T-184 - 59'-9" (S) and 59'-9" (N)	T-184 - 59'-9" (S - remains the same as 2014 design) and 74'-9" (N)
50'-2"	T-185 - 59'-9" (S) and 59'-9" (N)	T-185 - 59'-9" (S - remains the same as 2014 design) and 74'-9" (N)
50'-2"	T-186 - 59'-9" (S) and 59'-9" (N)	T-186 - 59'-9" (S - remains the same as 2014 design) and 74'-9" (N)
50'-2"	T-187 - 60'-11 1/2" (S) and 60'-11 1/2" (N)	T-187 - 60'-11 1/2" (S - remains the same as 2014 design) and 75'-11 1/2" (N)
50'-2"	T-188 - 61'-0" (S) and 63'-0" (N)	T-188 - 61'-0" (S - remains the same as 2014 design) and 78'-0" (N)
50'-2"	T-189 - 57'-1 1/4" (S) and 57'-1 1/4" (N)	T-189 - 57'-1 1/4" (S - remains the same as 2014 design) and 72'-1 1/4" (N)
50'-2"	T-190 - 64'-6 1/2" (S) and 64'-6 1/2" (N)	T-190 - 64'-6 1/2" (S - remains the same as 2014 design) and 79'-6 1/2" (N)
50'-2"	T-191 - 75'-9 1/4" (S) and 75'-9 1/4" (N)	T-191- 75'-9 1/4" (S - remains the same as 2014 design) and 90'-9 1/4" (N)
50'-2"	T-210 - 60'-8 1/2" (S) and 60'-8 1/2" (N)	T-210 - 68'-8 1/2" (S) and 60'-8 1/2" (N - remains the same as 2014 design)
50'-2"	T-238 - 69'-4" (S) and 69'-4" (N)	T-238 - 75'-4" (S) and 69'-4" (N - remains the same as 2014 design)
50'-2"	T-239 - 71'-9" (S) and 71'-9" (N)	T-239 - 86'-9" (S) and 71'-9" (N - remains the same as 2014 design)
50'-2"	T-240 - 75'-11 1/2" (S) and 75'-11 1/2" (N)	T-240 - 90'-11 1/2" (S) and 75'-11 1/2" (N - remains the same as 2014 design)

Existing Structures	2014 Design	2016 Design
50'-2"	T-242 - 76'-8 1/2" (S) and 76'-8 1/2" (N)	T-242 - 81'-8 1/2" (S) and 76'-8 1/2" (N - remains the same as 2014 design)
50'-2"	T-243 - 75'-11 1/2" (S) and 75'-11 1/2" (N)	T-243 - 80'-11 1/2" (S) and 75'-11 1/2" (N - remains the same as 2014 design)
50'-2"	T-246 - 78'-4 1/2" (S) and 76'-4 1/2" (N)	T-246 - 83'-4 1/2" (S) and 76'-4 1/2" (N - remains the same as 2014 design)
50'-2"	T-248 - 63'-1 3/4" (S) and 60'-1 3/4" (N)	T-248 - 71'-1 3/4" (S) and 60'-1 3/4" (N - remains the same as 2014 design)
50'-2"	T-257 - 62'-9 1/2" (S) and 62'-9 1/2" (N)	T-257 - 70'-9 1/2" (S) and 62'-9 1/2" (N - remains the same as 2014 design)
50'-2"	T-258 - 59'-11 1/4" (S) and 59'-11 1/4" (N)	T-258 - 74'-11 1/4" (S) and 59'-11 1/4" (N - remains the same as 2014 design)
50'-2"	T-259 - 70'-0 1/4" (S) and 59'-0 1/4" (N)	T-259 - 69'-8 1/2" (S) and 59'-0 1/4" (N - remains the same as 2014 design)
50'-2"	T-260 - 77'-2 1/4" (S) and 59'-2 1/4" (N)	T-260 - 76'-11 1/4" (S) and 59'-2 1/4" (N - remains the same as 2014 design)
50'-2"	T-261 - 59'-6 1/4" (S) and 59'-6 1/4" (N)	T-261 - 74'-3 1/4" (S) and 67'-6 1/4" (N)
50'-2"	T-262 - 59'-8 1/2" (S) and 59'-8 1/2" (N)	T-262 - 74'-8 1/2" (S) and 74'-8 1/2" (N)
50'-2"	T-263 - 62'-9" (S) and 62'-9" (N)	T-263 - 77'-9" (S) and 77'-9" (N)
50'-2"	T-264 - 59'-4 1/4" (S) and 56'-4 1/4" (N)	T-264 - 74'-4 1/4" (S) and 71'-4 1/4" (N)
50'-2"	T-265 - 57'-10 1/2" (S) and 55'-10 1/2" (N)	T-265 - 72'-10 1/2" (S) and 70'-10 1/2" (N)
50'-2"	T-266 - 58'-0 1/4" (S) and 58'-0 1/4" (N)	T-266 - 73'-0 1/4" (S) and 73'-0 1/4" (N)
50'-2"	T-267 - 59'-2 1/2" (S) and 59'-2 1/2" (N)	T-267 - 74'-2 1/2" (S) and 74'-2 1/2" (N)
50'-2"	T-268 - 60'-7" (S) and 60'-7" (N)	T-268 - 75'-7" (S) and 68'-7" (N)
50'-2"	T-269 - 59'-3 1/2" (S) and 59'-3 1/2" (N)	T-269 - 74'-3 1/2" (S) and 64'-3 1/2" (N)
50'-2"	T-270 - 65'-1 1/2" (S) and 65'-1 1/2" (N)	T-270 - 80'-1 1/2" (S) and 65'-1 1/2" (N - remains the same as 2014 design)
50'-2"	T-270A - 68'-10" (S) and 68'-10" (N)	T-270A - 83'-10" (S) and 68'-10" (N - remains the same as 2014 design)
50'-2"	T-271 - 73'-7 3/4" (S) and 73'-7 3/4" (N)	T-271 - 88'-7 3/4" (S) and 73'-7 3/4" (N - remains the same as 2014 design)
50'-2"	T-272 - 73'-5 1/4" (S) and 73'-5 1/4" (N)	T-272 - 88'-5 1/4" (S) and 73'-5 1/4" (N - remains the same as 2014 design)
50'-2"	T-273 - 71'-7 3/4" (S) and 71'-7 3/4" (N)	T-273 - 86'-7 3/4" (S) and 71'-7 3/4" (N - remains the same as 2014 design)
50'-2"	T-274 - 69'-10 1/2" (S) and 69'-10 1/2" (N)	T-274 - 84'-10 1/2" (S) and 69'-10 1/2" (N - remains the same as 2014 design)
50'-2"	T-275 - 82'-2" (S) and 82'-2" (N)	T-275 - 82'-2" (S) and 82'-2" (N) - remains the same as 2014 design
50'-2"	T-277 - 80'-9 1/4" (S) and 80'-9 1/4" (N)	T-277 - 79'-8 1/4" (S) and 75'-8 1/4" (N)
50'-2"	T-278 - 80'-1/2" (S) and 78'-1/2" (N)	T-278 - 73'-1/2" (S) and 71'-1/2" (N)
50'-2"	T-279 - 72'-2" (S) and 72'-2" (N)	T-279 - 72'-2" (S) and 72'-2" (N) - remains the same as 2014 design
50'-2"	T-320 - 65'-6" (S) and 59'-6" (N)	T-320 - 67'-6" (S) and 59'-6" (N - remains the same as 2014 design)
50'-2"	T-323 - 68'-11 1/2" (S) and 61'-11 1/2" (N)	T-323 - 69'-11 1/2" (S) and 61'-11 1/2" (N - remains the same as 2014 design)
50'-2"	T-342 - 58'-3 3/4" (S) and 58'-3 3/4" (N)	T-342 - 70'-4 1/4" (S) and 70'-4 1/4" (N)
50'-2"	T-343 - 59'-11 3/4" (S) and 59'-11 3/4" (N)	T-343 - 74'-11 3/4" (S) and 74'-11 3/4" (N)

Existing Structures	2014 Design	2016 Design
50'-2"	T-344 - 61'-3" (S) and 61'-3"(N)	T-344 - 76'-3" (S) and 76'-3" (N)
50'-2"	T-345 - 60'-1 1/4" (S) and 60'-1 1/4" (N)	T-345 - 75'-1 1/4" (S) and 75'-1 1/4" (N)
50'-2"	T-346 - 59'-10" (S) and 59'-10" (N)	T-346 - 74'-10" (S) and 74'-10" (N)
50'-2"	T-347 - 59'-1 1/2" (S) and 59'-1 1/2" (N)	T-347 - 74'-1 1/2" (S) and 74'-1 1/2" (N)
50'-2"	T-348 - 61'-8 1/4" (S) and 61'-8 1/4" (N)	T-348 - 61'-8 1/4" (S - remains the same as 2014 design) and 69'-8 1/4"(N)
50'-2"	T-356 - 59'-4 3/4" (S) and 59'-4 3/4" (N)	T-356 - 59'-4 3/4" (S - remains the same as 2014 design) and 67'-4 3/4" (N)
50'-2"	T-359 - 59'-11" (S) and 57'-11" (N)	T-359 - 59'-11" (S - remains the same as 2014 design) and 65'-11" (N)
50'-2"	T-362 - 60'-1 1/2" (S) and 60'-1 1/2" (N)	T-362 - 60'-1 1/2" (S - remains the same as 2014 design) and 70'-1 1/2" (N)
50'-2"	T-363 - 68'-9" (S) and 68'-9" (N)	T-363 - 68'-9" (S - remains the same as 2014 design) and 83'-9" (N)
50'-2"	T-364 - 78'-6 1/4" (S) and 73'-6 1/4" (N)	T-364 - 78'-6 1/4" (S - remains the same as 2014 design) and 78'-6 1/4" (N)
50'-2"	T-378 - 63'-8 1/4" (S) and 59'-8 1/4" (N)	T-378 - 67'-8 1/4" (S) and 67'-8 1/4" (N)
50'-2"	T-379 - 74'-5 1/4" (S) and 55'-5 1/4" (N)	T-379 - 74'-5 1/4" (S - remains the same as 2014 design) and 70'-5 1/4" (N)
50'-2"	T-380 - 74'-2 1/2" (S) and 55'-2 1/2" (N)	T-380 - 74'-2 1/2" (S - remains the same as 2014 design) and 70'-2 1/2" (N)
50'-2"	T-381 - 74'-0 1/2" (S) and 56'-11 1/2" (N)	T-381 - 77'-0 1/2" (S) and 72'-0 1/2" (N)
50'-2"	T-382 - 74'-9" (S) and 59'-9" (N)	T-382 - 74'-9" (S - remains the same as 2014 design) and 74'-9" (N)
50'-2"	T-383 - 74'-5 1/2" (S) and 59'-5 1/2" (N)	T-383 - 74'-5 1/2" (S - remains the same as 2014 design) and 74'-5 1/2" (N)
50'-2"	T-384 - 74'-8 1/4" (S) and 59'-8 1/4" (N)	T-384 - 74'-8 1/4" (S - remains the same as 2014 design) and 74'-8 1/4" (N)
50'-2"	T-385 - 74'-7 1/4" (S) and 58'-7 1/4" (N)	T-385 - 76'-7 1/4" (S) and 73'-7 1/4" (N)
50'-2"	T-386 - 76'-4 3/4" (S) and 56'-4 3/4" (N)	T-386 - 76'-4 3/4" (S - remains the same as 2014 design) and 71'-4 3/4" (N)
50'-2"	T-387 - 80'-10" (S) and 55'-1 1/2" (N)	T-387 - 80'-10" (S - remains the same as 2014 design) and 63'-1 1/2" (N)
50'-2"	T-390 - 70'-11 1/2" (S) and 70'-0 3/4" (N)	T-390 - 71'-0 3/4" (S) and 71'-0 3/4" (N)
50'-2"	T-404 - 59'-3 3/4" (S) and 59'-3 3/4" (N)	T-404 - 67'-3 3/4" (S) and 67'-3 3/4" (N)
50'-2"	T-405 - 59'-9" (S) and 60'-0" (N)	T-405 - 68'-0" (S) and 68'-0" (N)
50'-2"	T-406 - 59'-7 1/2" (S) and 59'-7 1/2" (N)	T-406 - 74'-7 1/2" (S) and 74'-7 1/2" (N)
50'-2"	T-407 - 59'-2 1/4" (S) and 59'-2 1/4" (N)	T-407 - 74'-0 1/4" (S) and 74'-0 1/4" (N)
50'-2"	T-408 - 56'-5 1/2" (S) and 56'-5 1/2" (N)	T-408 - 64'-5 1/2" (S) and 64'-5 1/2" (N)
50'-2"	T-414 - 65'-8 1/2" (S) and 59'-8 1/2" (N)	T-414 - 69'-8 1/2" (S) and 59'-8 1/2" (N) - remains the same as 2014 design
50'-2"	T-428 - 68'-1" (S) and 70'-1" (N)	T-428 - 75'-1" and 70'-1" (N - remains the same as 2014 design)

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APPENDIX D
QUALIFICATIONS OF PREPARERS

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QUALIFICATIONS OF RESEARCHERS

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Lauren C. Archibald has over 30 years experience in historic preservation planning, architectural survey and evaluation, effects assessment, and report preparation for various types of historic resources throughout Pennsylvania, New Jersey, and Delaware.

Alison J. Ross, M.S. – Architectural Historian

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Alison J. Ross has over 15 years experience on the local, state, and Federal level in architectural survey and evaluation, effects assessment, and report preparation for historic resources throughout Pennsylvania, New Jersey, Maryland, Delaware, Ohio, and West Virginia.