Witness: **Scott Newland,Timothy Barton**
Request from: **Energy Facilities Siting Board**

Question:
Please refer to Table 5-10 of the Petition;

a. Please identify all "public facilities" within 1,200 feet of the edge of the ROW. Please provide actual distances for each facility to the ROW.

b. In collecting the information for Table 5-10, did the measurements take into account playgrounds and playing fields for schools, or just the distance to the actual building? If only the distance to buildings were used, please also provide the distances to the edge of the school property, and update Table 5-10 if necessary.

Response:
For item a, see Table NO-1 below.

Table NO-1: Public Facilities Identified with 1,200 Feet of the Preferred Northern Route [1]

Public Facility	Distance from Edge of ROW to Property (feet)	Distance from Edge of ROW to Building (feet)
Agawam High School (Agawam, MA)	275	570
Robinson Park School (Agawam, MA)	0	1,215
Robinson State Park (Agawam, MA)	0	2,100
Cook Playground	0	250
St. Thomas the Apostle School (West Springfield, MA)	750	850
West Springfield Fire Station (West Springfield, MA)	0	0
West Springfield High School (West Springfield, MA)	0	770
West Springfield Middle School (West Springfield, MA)	60	515
John Fausey School (West Springfield, MA)	1,050	1,350
Lower Pioneer Valley Educational Collaborative (West Springfield, MA)	0	1,190
John Ashley School (West Springfield, MA)	0	185
Anne E. Barry School (Chicopee, MA)	450	950
Birch Manor Nursing Home (Chicopee, MA)	990	1,100

Note:
1. The information provided is for the Massachusetts portion of the preferred Northern Route only not including the three short 115-kV span .

For Item b, the distances to schools for Table 5-10 was the distance to the building, not taking into account playgrounds or playing fields. Table 5-10 REVISED contains updated information on public facilities based on the distances to school property as noted in Table NO-1 above.

Table 5-10 REVISED: Preferred Northern Route[1] Noise-Sensitive Receptors

Evaluation Criteria Metrics	Preferred Northern Route
Residences within 100 feet of edge of ROW (Number)	316
Residences within 101 to 300 feet of edge of ROW (Number)	754
Businesses within 100 feet of edge of ROW or centerline (Number)	46
Businesses within 101 to 300 feet of edge of ROW (Number)	42
Public Facilities within 300 feet of edge of ROW (Number)	8
Public Facilities within 301 to 1,200 feet of edge of ROW (Number)	5
Length by land use (Park/School/Open Space)	3.3 miles

Note:
1. The information provided is for the Massachusetts portion of the preferred Northern Route only not including the three short 115-kV line spurs.

Witness: Scott Newland,Timothy Barton
Request from: Energy Facilities Siting Board

Question:
Please refer to Table 5-11 of the Petition;

a. Please identify all "public facilities" within 1,200 feet of the edge of the ROW. Please also provide actual distances for each facility to the ROW.

b. In collecting the information for Table 5-11, did the measurements take into account playgrounds and playing fields for schools, or just the distance to the actual building? If only the distance to buildings were used, please provide the distances to the edge of the school property, and update Table 5-11 if necessary.

Response:

For item a, see Table NO-2 below.

Table NO-2: Public Facilities Identified within 1,200 Feet of the Noticed-Alternative Southern Route[1]

Public Facility	Distance from Edge of ROW to Property (feet)	Distance from Edge of ROW to Building (feet)
Agawam High School (Agawam, MA)	275	570
Country Estates Nursing Home (Agawam, MA)	0	1,110
Wolf Swamp Park and Conservation Area (Longmeadow, MA)	850	1,450
Soule Road School (Wilbraham, MA)	850	1,090
Wilbraham Game Farm (Wilbraham, MA)	0	150
Minnechaug Regional High School (Wilbraham, MA)	1,050	1,900
Wilbraham Town Hall (Wilbraham, MA)	550	600
Wilbraham Middle School (Wilbraham, MA)	1,150	1,600
Orchard Valley Senior Living Center (Wilbraham, MA)	0	30

Note:
1. The information provided is for the Massachusetts portion of the 345-kV Noticed-Alternative Southern Route only.

For Item b, the distances to schools for Table 5-11 was the distance to the building, not taking into account playgrounds or playing fields. Table 5-11 REVISED contains updated information on public facilities based on the distances to school property as noted in Table NO-2 above.

Table 5-11 REVISED: Noticed-Alternative Southern Route Noise-Sensitive Receptors

Evaluation Criteria Metrics	Southern Route [1]
Residences within 100 feet of edge of ROW (Number)	112
Residences within 101 to 300 feet of edge of ROW (Number)	362
Businesses within 100 feet of edge of ROW or centerline (Number)	8
Businesses within 101 to 300 feet of edge of ROW (Number)	16
Public Facilities within 300 feet of edge of ROW (Number)	4
Public Facilities within 301 to 1,200 feet of edge of ROW (Number)	5
Length by land use (Park/School/Open Space)	0.6 miles

[1]Note:
The information provided is for the Massachusetts portion of the 345-kV Noticed-Alternative Southern Route only.

Witness: Scott Newland,Timothy Barton
Request from: Energy Facilities Siting Board

Question:
Please provide a table detailing the construction noise at the closest residences (i.e., less than 25 feet from the source of construction noise, at 25 feet, at 50 feet, and at 100 feet) for both the northern and southern routes. Please include construction noise from installation of monopoles, installation of H-frames, clearing of ROW, noise emanating from temporary work spaces etc. Please include an analysis of noise increases during construction based on daytime ambient and nighttime ambient.

Response:

An analysis of how construction noise will affect the closest residences requires analyzing the current ambient sound levels and the sound created by the various potential construction activities. Existing ambient measurements were taken at various locations along each route to quantify sound at locations that would be considered typical of others along the route, based on distance from the right-of-way and highways or other noise-producing entities. Six locations were selected along the Preferred Northern Route (See EFSB-NO-3 Attachment 1) and five locations were selected along the Noticed-Alternative Southern Route (see EFSB-NO-3 Attachment 2). These points are considered representative of many locations along the right-of-way due to the similarities in proximity to existing structures, proximity to proposed structures, and proximity to highways or other non-WMECO noise-producing entities. Ambient sound levels were recorded over a 15-minute period.

Lowest existing ambient noise levels are determined by measuring the sound level that was exceeded during 90 percent of a specific time period (L_{90}). The following table presents the lowest measured ambient sound levels (L_{90}, dBA) at each of the measurement points. The goal was to attain the lowest possible measurements during various daytime and nighttime periods throughout two days.

Lowest Existing Ambient Sound Levels for Preferred Northern Route (L_{90}, dBA)

	Preferred Northern Route					
Period	NRMP1	NRMP2	NRMP3	NRMP4	NRMP5	NRMP6
Daytime	36.7	38	43	45	50.1	40
Nighttime	34.8	34.9	41.1	40.3	44	41.3

Lowest Existing Ambient Sound Levels for Noticed-Alternative Southern Route (L_{90}, dBA)

	Noticed-Alternative Southern Route				
Period	SRMP1	SRMP2	SRMP3	SRMP4	SRMP5
Daytime	33.7	33	36.3	37.1	37
Nighttime	34.6	32.2	34.5	34	35.5

Various construction-related activities are expected to occur at different times. These activities were detailed in Section 5.5 of the Comparison of Proposed Facilities submitted to the EFSB. The activities that would occur along the right-of-way and would generate noise are presented below.

Construction Phase	Typical Equipment/Materials Required
Establish erosion and sediment controls	Pickup and other small trucks
Clear for new access roads or improve existing roads	• Flatbed truck • Brush hog • Bulldozer • Bucket trucks for canopy trimming • Wood chipper • Side booms, forklifts and cranes to handle materials
Construction of new access road or improve existing roads to provide a travel way of at least 15 to 20 feet in width	• Bulldozer or front loader • Pickup or stake body trucks for culverts, etc. • Dump trucks for crushed stone or gravel • Pickups or stake-body trucks for culverts • Mat installer for wetland mats • Roads may be wood, gravel, or matted; using culverts or crushed stone for wet areas; roads may be temporary or permanent. Roads must have sufficient width and capacity for heavy construction equipment, both over-the-road and off-road vehicles, including oversize tractor trailers. The need for access for flatbed trailers and concrete truck often determines the scope of access road improvements. Road grades must be negotiable for over-the-road trucks; 10 percent maximum, and less if wet weather or surface conditions provide traction problems. Vehicles with tracks or tires are used.
Preparation of staging and lay down areas if they are to be off the ROW	• Same equipment for access road construction will be used. • Establish field office trailers, sanitary facilities, and parking areas, as well locations for material and equipment storage.
Preparation of work area at sites of existing and new structures	• Same equipment for access road construction and staging area preparation will be used. • Reel trailers to haul out old conductors • Trucks to haul out old hardware • Flatbed trucks with a crane to remove structures • Trucks with welding equipment to cut steel supports or components • Dump trucks to haul smaller components
Construction of new line structures	• Same equipment for access road construction and staging area preparation will be used with addition of caissons for foundations, flatbed trucks for structure components, auger, excavator, cranes, other trucks for reinforcing rods, concrete trucks for structures requiring concrete pads or foundations, bucket trucks and hardware, conductor reels, and conductor pulling rigs. Dump trucks are needed for the foundation work if excess excavated material has to be removed from the ROW. In wet conditions or if groundwater is encountered, the water is pumped to a temporary settling basin with erosion and sedimentation controls including geotextile fabric, silt fence, hay bales and crushed stone. As with all other activities, this would have to comply with any applicable regulation.

Construction Phase	Typical Equipment/Materials Required
Removal of existing line structures	• Bucket trucks for dismantling existing lines, with reel trailers to capture and store old conductors, trucks to remove old hardware, flatbed truck with crane to remove structures, trucks with welding equipment to cut steel supports or components, stake or dump trucks to remove smaller components. To minimize wetland impacts or to access structures with challenging topography, helicopter may be used for removal.
Restoration	• Pickup and other small trucks. • All debris is to be removed from the ROW for disposal; but brush may be piled, scattered, or chipped. Disturbed ground is back bladed to its preconstruction contours unless directed otherwise. If the work site is in an agricultural field, the soil can be decompacted by disking. Erosion controls are left in place until vegetation is established. Steep areas are stabilized with jute netting or pre-made erosion control fabric containing seed, mulch, and fertilizer. Access roads where culverts or crushed stone fords were installed will be left in place or removed as directed by the regulatory authorities in accordance with permit/certificate conditions.

The noise impacts that these activities can vary considerably based on the proximity of the residences to the activities. Generic ranges of sound data are available for various types of equipment at certain distances. Since none of the equipment will operate directly at a residence, noise levels were calculated based on a residence being located approximately 50 feet from the construction activity. This is unrealistically conservative for most residences along the right-of-way as additional distance from the construction activity leads to significantly lower sound levels at the residences. The table below lists generic activities and the associated range of sound levels at 50 feet.

Range of Typical Construction Equipment Noise Levels (dBA)

Generic Construction Equipment	Minimum Noise at 50 feet	Maximum Noise at 50 feet
Backhoes	74	92
Compacters (Rollers)	73	76
Compressors	73	86
Concrete Mixers	76	88
Cranes (movable)	70	94
Dozers	65	95
Front Loaders	77	96
Generators	71	83
Graders	72	91
Jack Hammers and Rock Drills	80	98
Pavers	85	87
Pumps	69	71
Scrapers	76	95
Tractors	77	95
Trucks	83	96

1.Values taken from FHWA Highway Construction noise (http://www.fhwa.dot.gov/environment/noise/highway/hcn06.htm) and the HEARS database.

The types of equipment listed in the table above will be used at various times and for various amounts of time. Most activities would not occur at the same time or location. The construction phases will not typically occur simultaneously but will occur sequentially. In addition, the construction phases may be separated by periods of no construction.

These activities will certainly not always be 50 feet away from a residence, and will hardly ever occur at the same time or exact location. Because of this, WMECO expects that the maximum sound level during any of these activities would be between 85 and 95 dBA at 50 feet for a short duration. At these project construction noise levels, the existing ambient noise levels would have to be within 5 dBA of the construction noise levels in order to make an appreciable difference to the overall noise level. Accordingly, the overall noise level combining these ambient levels and these construction noise levels will generally equal the noise levels of the construction activities alone. In addition, the construction noise level would quickly drop similar to a car passing by. Sound levels are expected to be in the 65-75 dBA range (similar to along a busy street) for areas where activities are occurring at distances greater than 50 feet away. Most right-of-way construction activities are expected to occur during the daytime, and only minimal nighttime activities will occur if necessitated by circuit-outage conditions. The equipment that would be used during the nighttime will have significantly lower sound levels associated with it, and sound abatement will be used during any period when it is warranted.

To specifically address the request, the noise levels from the table above have been calculated at less than 25 feet (10 feet was selected), 25 feet, and 100 feet. The most conservative approach is used here by not accounting for any ground absorption (which would decrease the sound level) or any other type of attenuation. The calculated values at 10, 24, and 100 feet, with the 500 foot levels shown again, are listed below.

Typical Construction Equipment Noise Levels (dBA)

Generic Construction Equipment	Maximum Noise at 10 feet	Maximum Noise at 25 feet	Minimum Noise at 50 feet	Maximum Noise at 100 feet
Backhoes	106	98	92	86
Compacters (Rollers)	90	82	76	70
Compressors	100	92	86	80
Concrete Mixers	102	94	88	82
Cranes (movable)	108	100	94	88
Dozers	109	101	95	89
Front Loaders	110	102	96	90
Generators	97	89	83	77
Graders	105	97	91	85
Jack Hammers and Rock Drills	112	104	98	92
Pavers	101	93	87	81
Pumps	85	77	71	65
Scrapers	109	101	95	89
Tractors	109	101	95	89
Trucks	110	102	96	90

Noise associated with the construction activities will have a temporary impact on the residences adjacent to those activities. There will be times when the residents will experience sounds that would be considered loud. These sounds, however, will be temporary in nature and would only last up to a week in most instances. Once construction activities have stopped, the sound levels near the residences would return to the existing ambient sound levels, with no lasting sound impacts along the right-of-way.

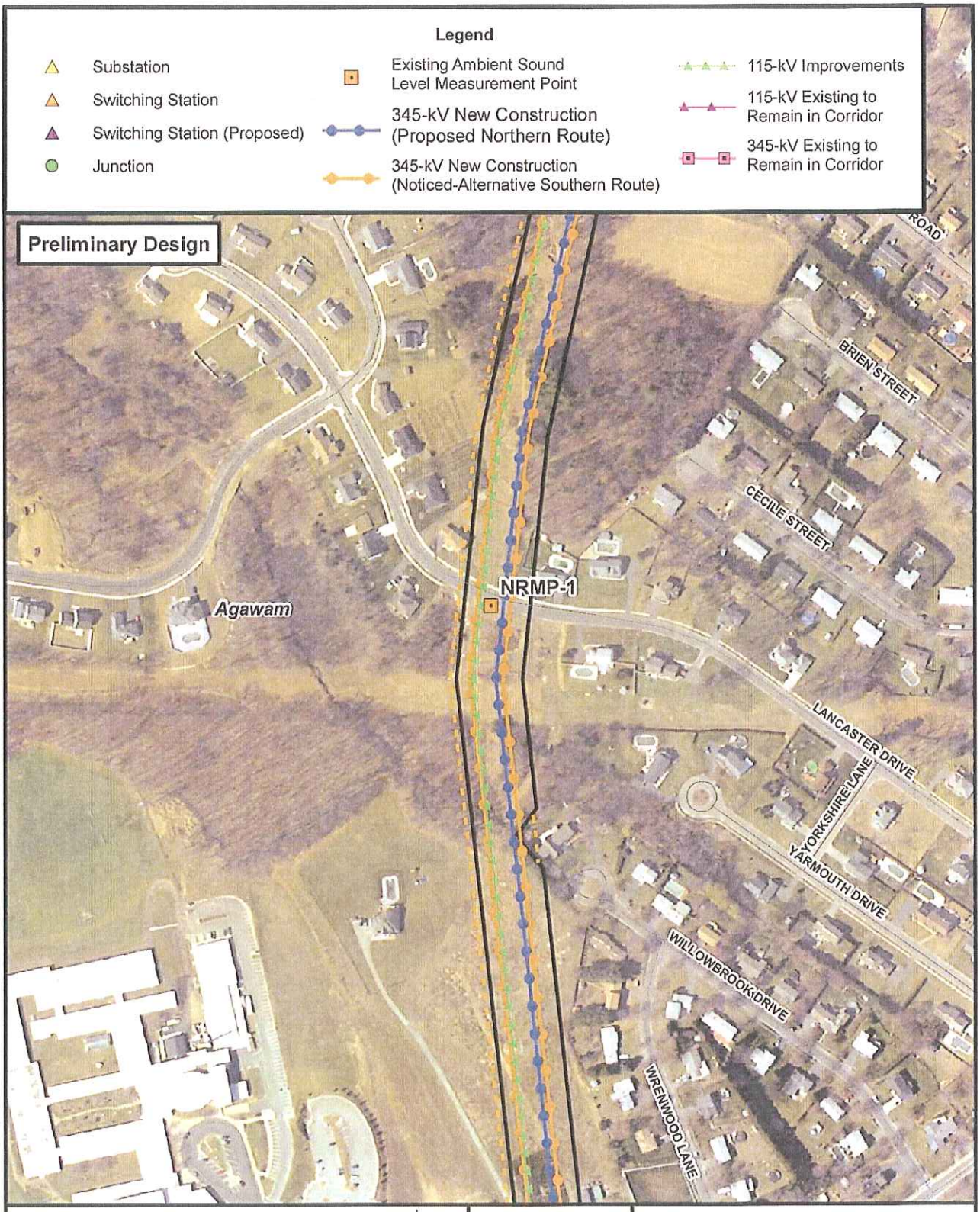

Figure 1 NRMP1
Project Location Map
Greater Springfield Reliability Project
Existing Ambient Sound Level Measurement Points

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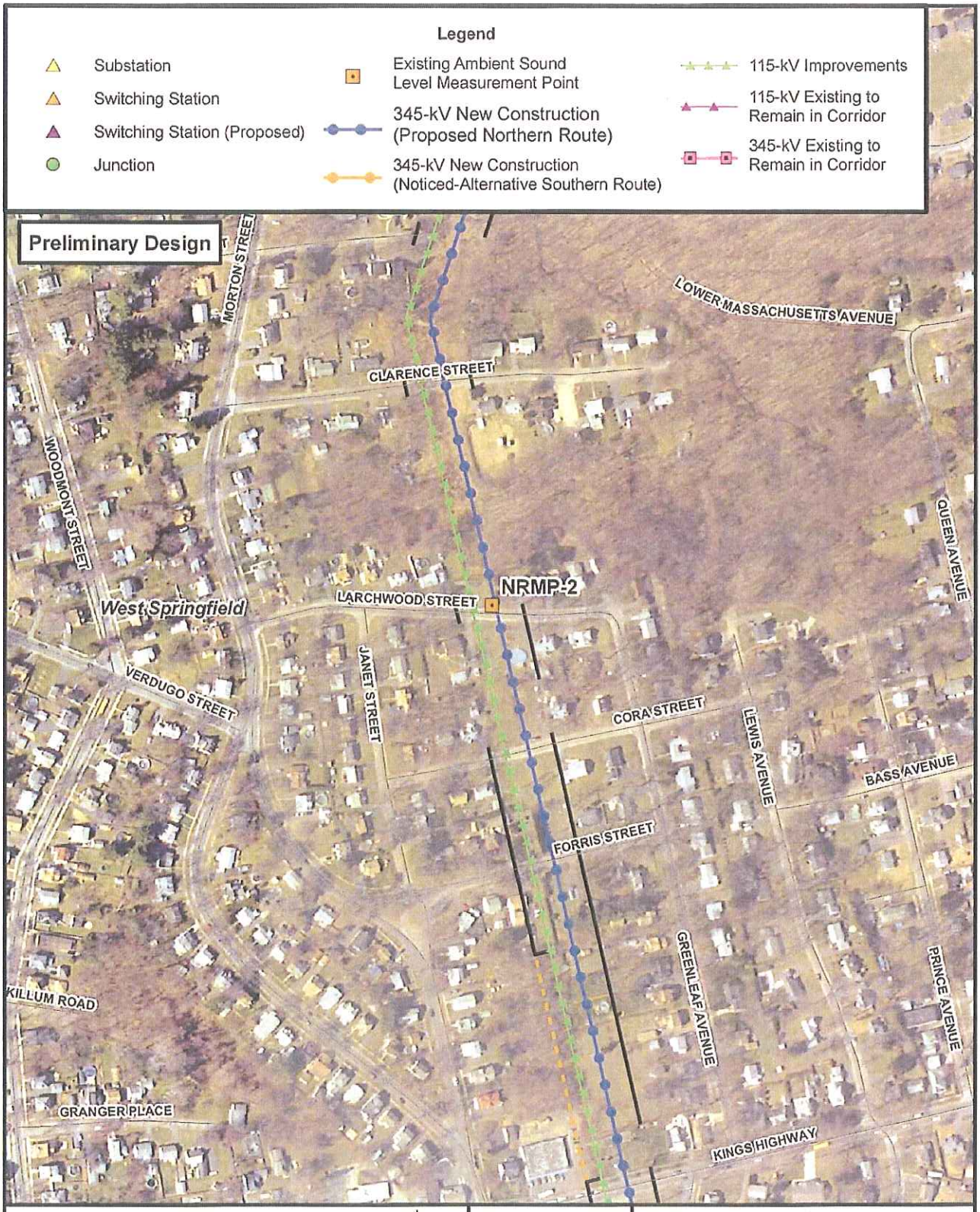

Scale is 1:3,600 when printed at 8.5" x 11".

Source: Aerials (2005 & 2006), ESRI, and Burns & McDonnell Engineering Co.

Burns & McDonnell SINCE 1898

Figure 2 NRMP2
Project Location Map
Greater Springfield Reliability Project
Existing Ambient Sound Level Measurement Points

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Issued: July 13, 2009

Scale is 1:3,600 when printed at 8.5" x 11".

Source: Aerials (2005 & 2006), ESRI, and Burns & McDonnell Engineering Co.

Burns & McDonnell SINCE 1898

Figure 3 NRMP3
Project Location Map
Greater Springfield Reliability Project
Existing Ambient Sound Level Measurement Points

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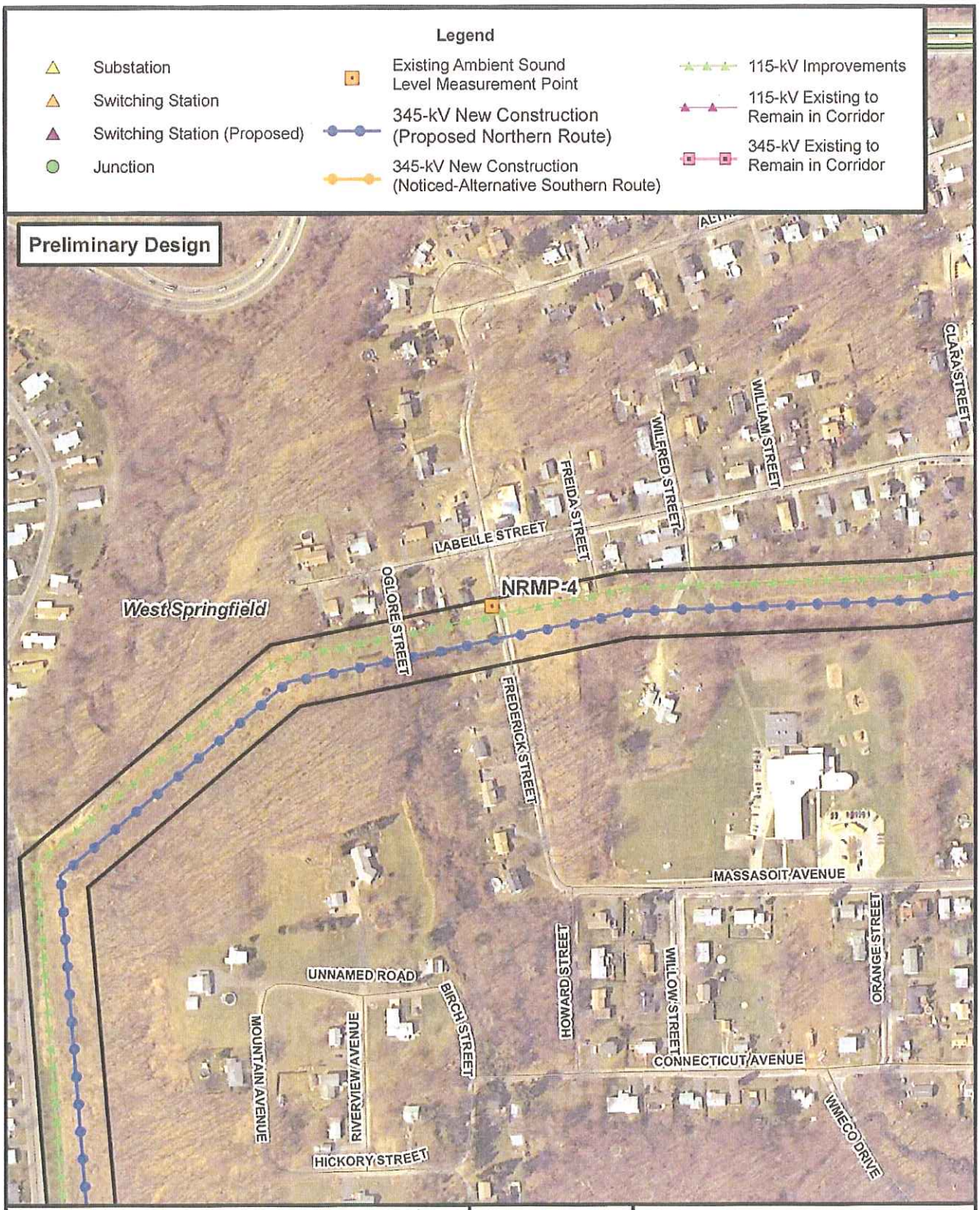

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Source: Aerials (2005 & 2006), ESRI, and Burns & McDonnell Engineering Co.

Burns & McDonnell SINCE 1898

Figure 4 NRMP4
Project Location Map
Greater Springfield Reliability Project
Existing Ambient Sound Level Measurement Points

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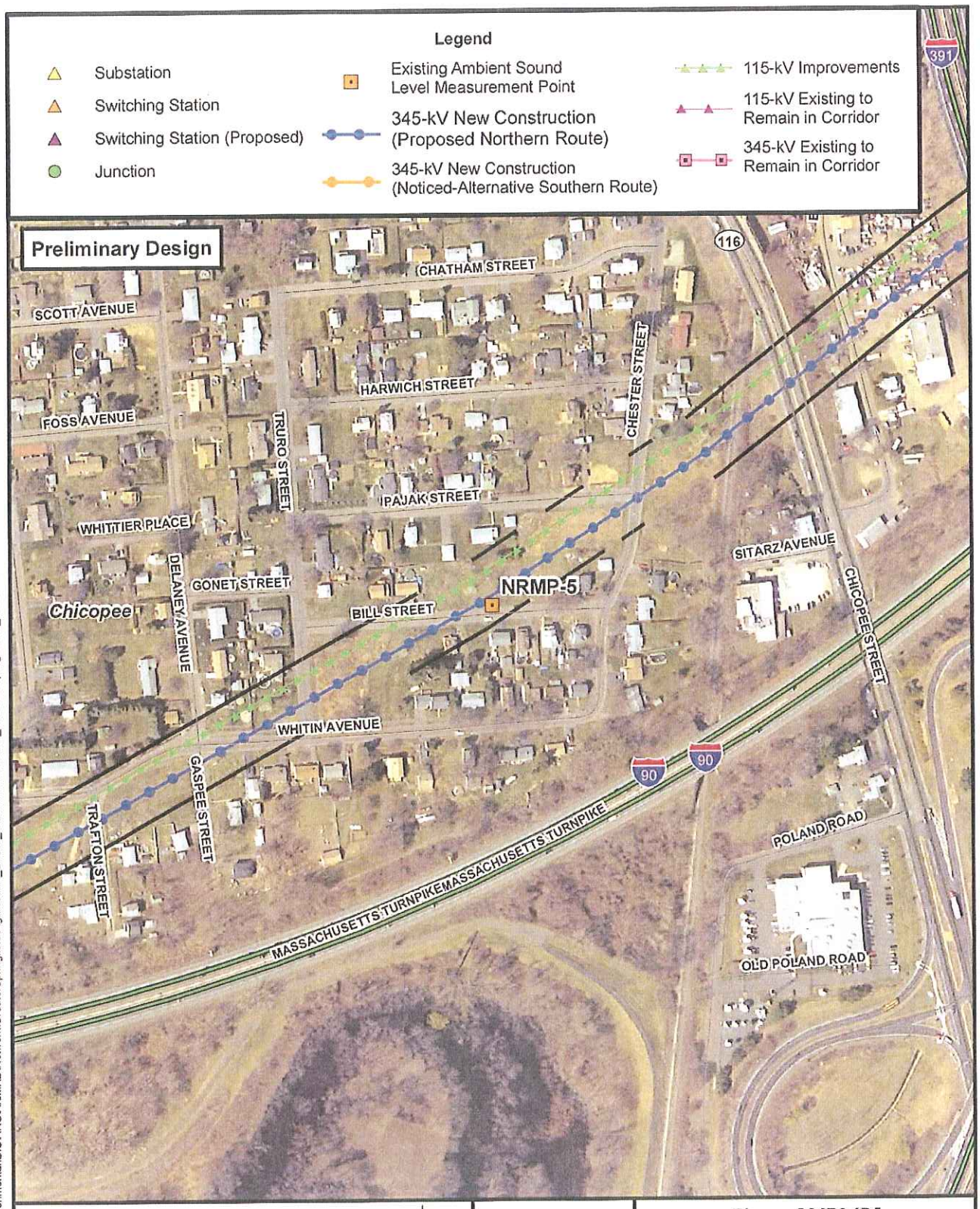

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Scale is 1:3,600 when printed at 8.5" x 11".

Source: Aerials (2005 & 2006), ESRI, and Burns & McDonnell Engineering Co.

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Burns & McDonnell SINCE 1898

Figure 5 NRMP5
Project Location Map
Greater Springfield Reliability Project
Existing Ambient Sound Level Measurement Points

Issued: July 13, 2009

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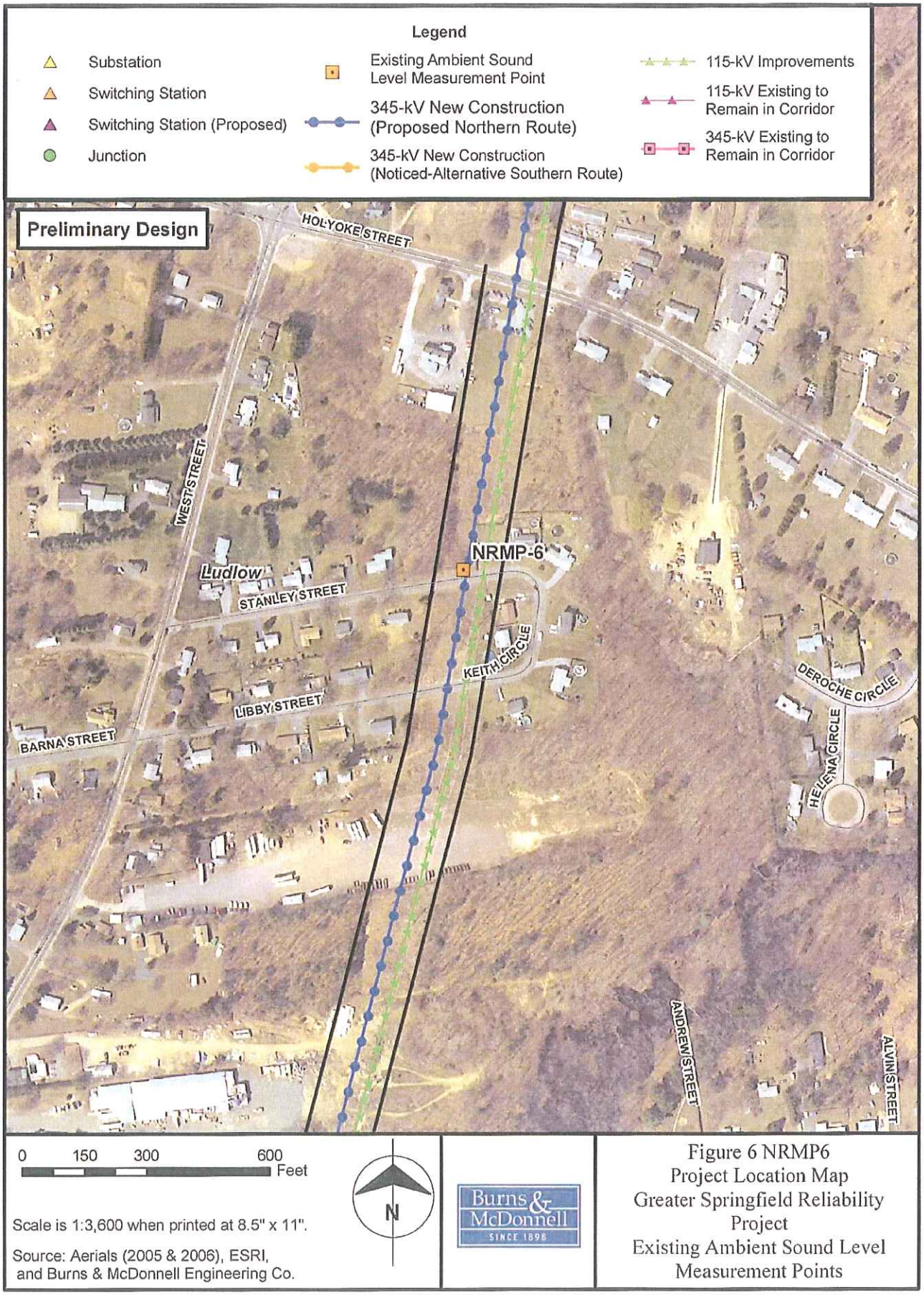

Figure 6 NRMP6
Project Location Map
Greater Springfield Reliability Project
Existing Ambient Sound Level Measurement Points

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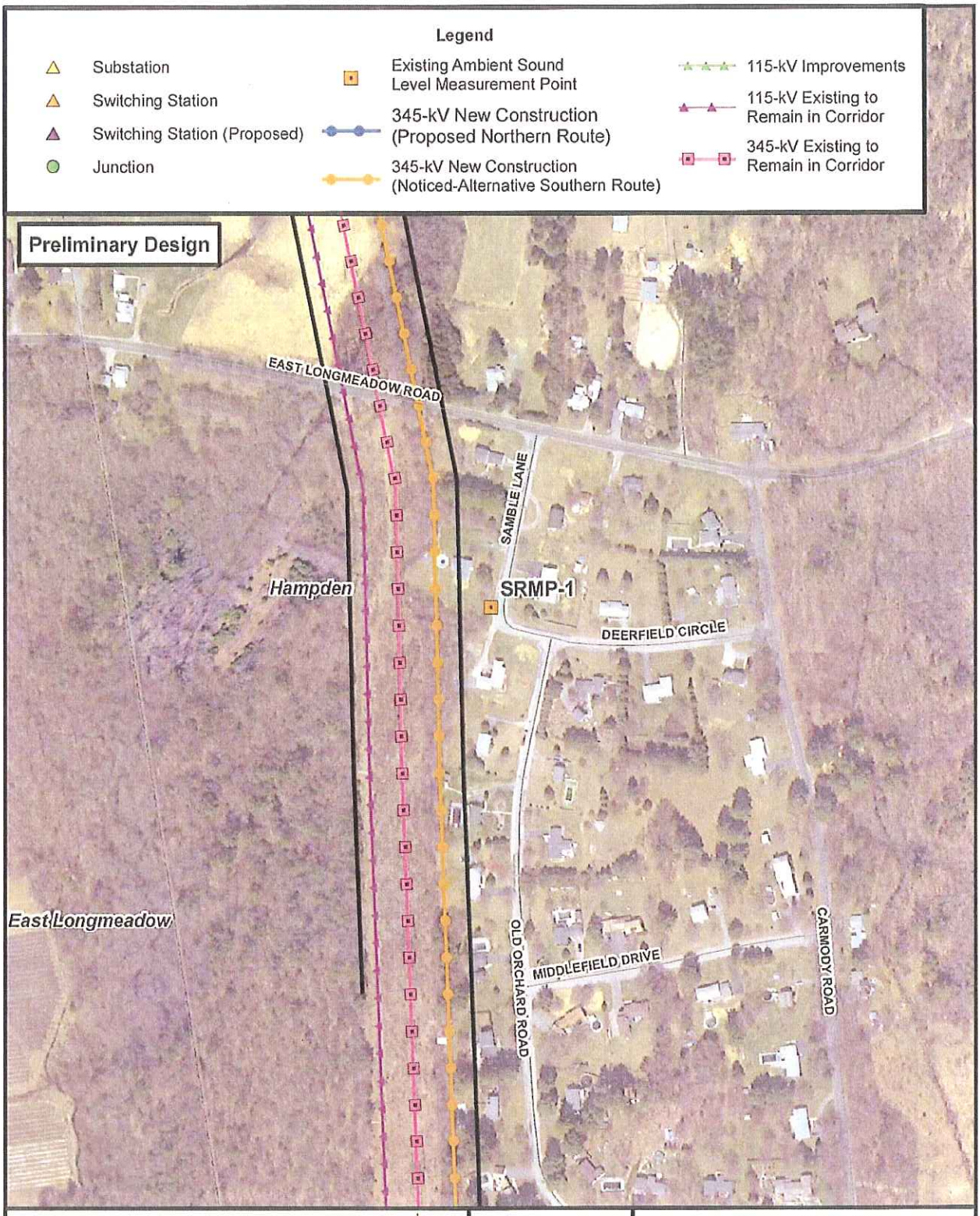

Figure 7 SRMP1
Project Location Map
Greater Springfield Reliability Project
Existing Ambient Sound Level Measurement Points

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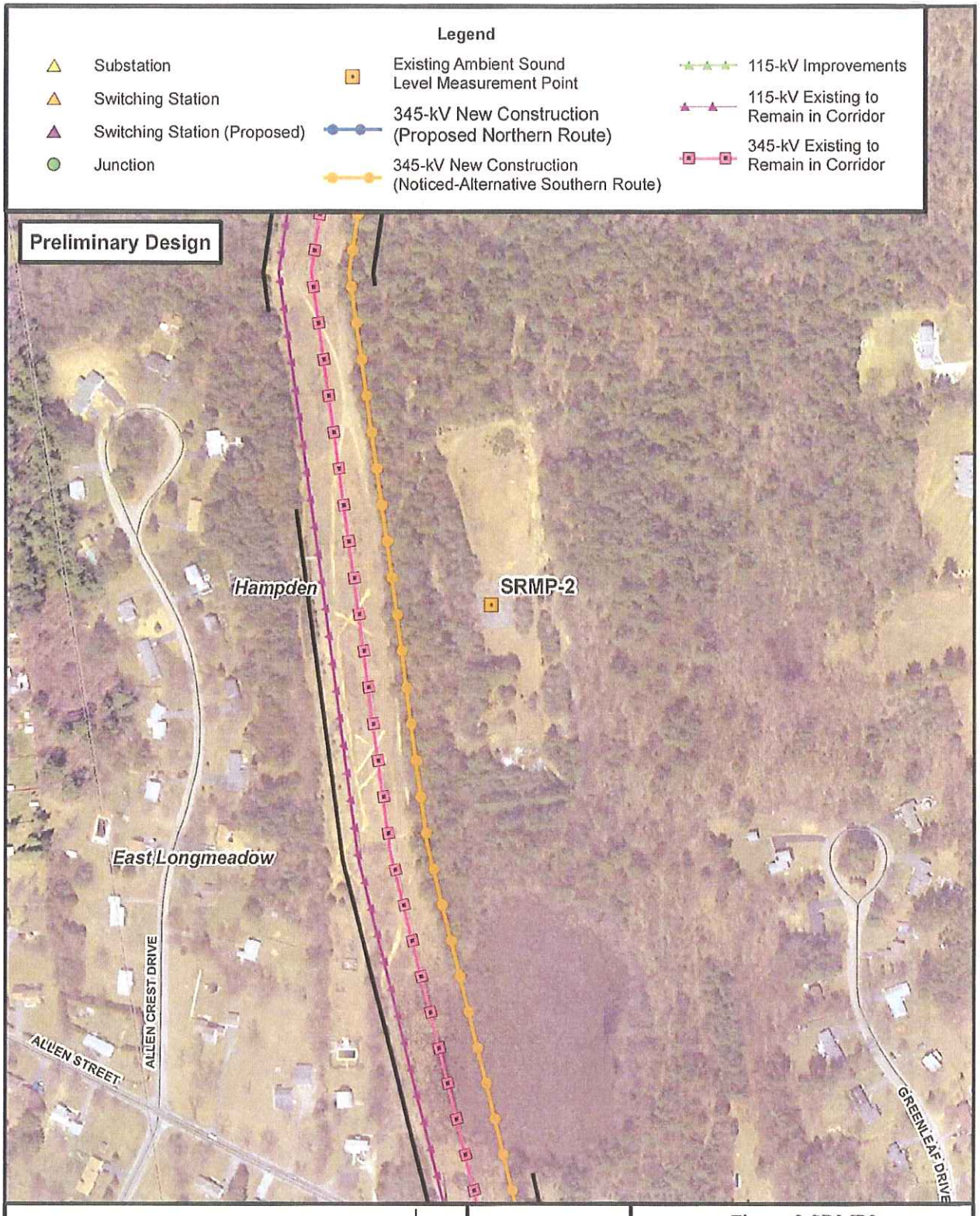

Scale is 1:3,600 when printed at 8.5" x 11".

Source: Aerials (2005 & 2006), ESRI, and Burns & McDonnell Engineering Co.

Burns & McDonnell SINCE 1898

Figure 8 SRMP2
Project Location Map
Greater Springfield Reliability Project
Existing Ambient Sound Level Measurement Points

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Issued: July 13, 2009

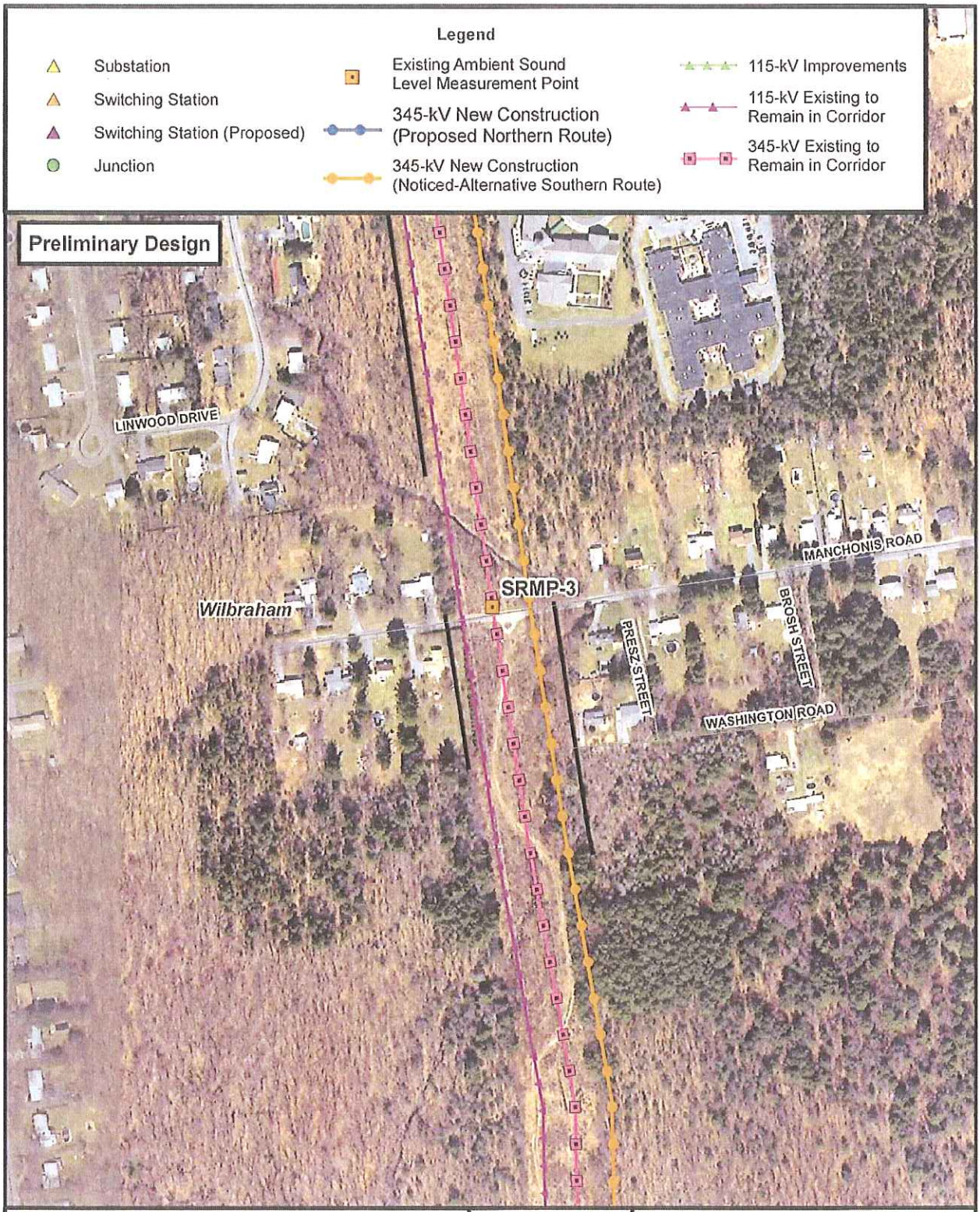

Figure 9 SRMP3
Project Location Map
Greater Springfield Reliability Project
Existing Ambient Sound Level Measurement Points

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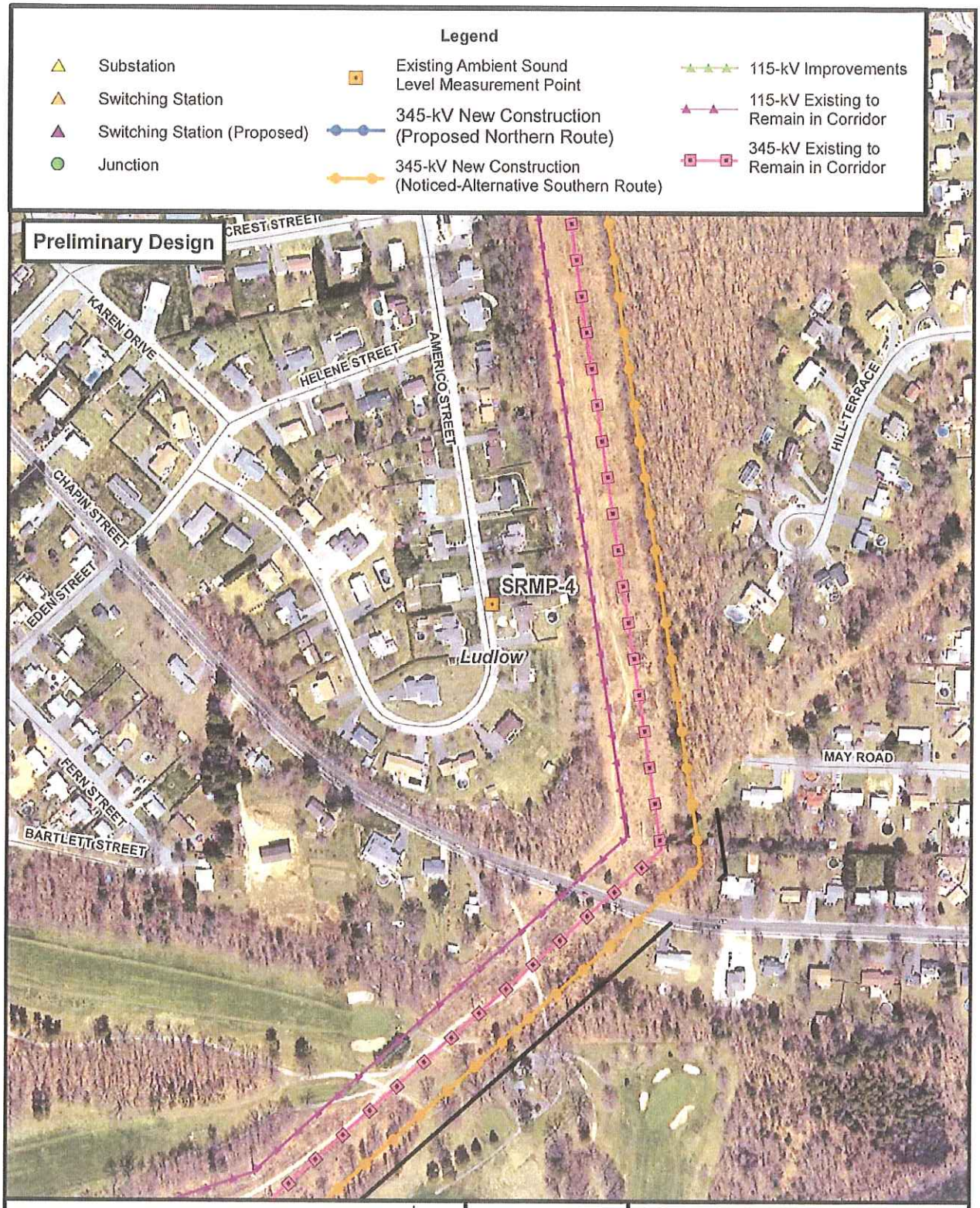

Figure 10 SRMP4
Project Location Map
Greater Springfield Reliability Project
Existing Ambient Sound Level Measurement Points

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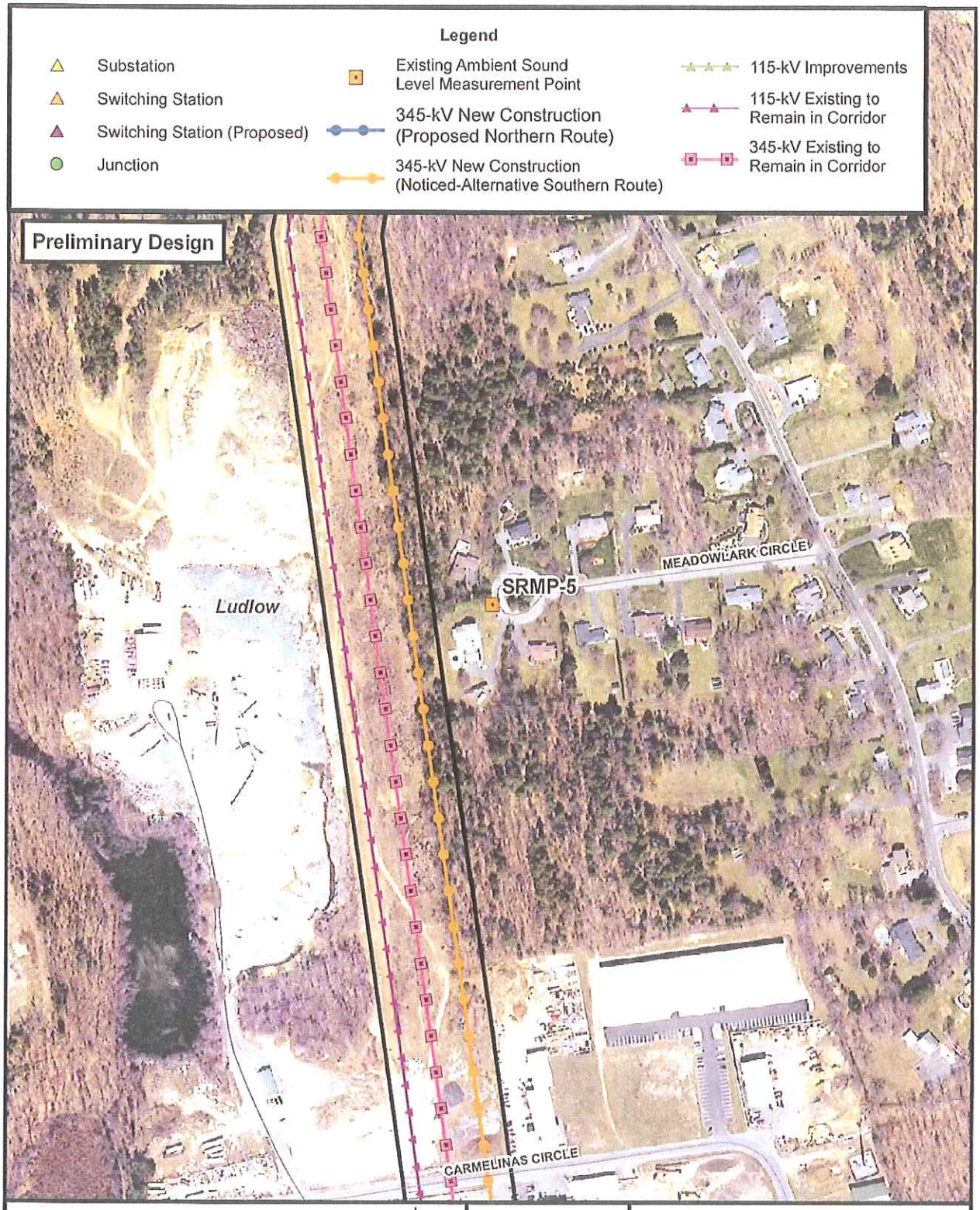

Figure 11 SRMP5
Project Location Map
Greater Springfield Reliability Project
Existing Ambient Sound Level Measurement Points

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Issued: July 13, 2009

Witness: **Scott Newland,Timothy Barton**
Request from: **Energy Facilities Siting Board**

Question:
Please provide a table detailing the construction noise at the closest residences to each of the substations and switching stations. Please include construction noise from installation of all substation equipment and access roads. Please indicate the noise impacts at the substation property lines and at a number of residential receptors. For the Agawam Substation include Sutton Place Apartments and Prospect Street. Please include an analysis of noise increases based on daytime ambient and nighttime ambient.

Response:

Ambient sound levels were measured for the Agawam and Ludlow Substations, and Fairmont Switching Stations (see Exhibits 5.6 of the Petition - Environmental Sound Assessment Study).

Apart from the construction activities associated with the ROW construction which may occur up to the last structure demolished or constructed or the closest point of a new access road, the noise effects of construction activities at the other substations and switching stations are associated with distinctly different construction activities. The construction activities at these other substations and switching stations are restricted to making the new terminal connections and doing equipment replacements on a one-for-one basis. The noise levels associated with terminal connections and equipment replacements are much lower than construction noise levels on the ROW or at the Agawam, Ludlow and Fairmont facilities and will be discussed in a supplement to this response. In addition, there are no residents within 50 feet of South Agawam and Shawinigan Switching Stations, and Chicopee, Orchard and Piper Substations.

All measurement points were chosen close to the Agawam, Breckwood, Cadwell, Fairmont and Ludlow facilities and situated such that the sound emanating towards the nearest residence would be analyzed.

Two measurement points were picked to quantify the sound levels on either side of the Agawam Substation (Figure 5-1 of Exhibit 5.6 of the Petition). MP2 was specifically chosen due to its proximity to the Sutton Place Apartments and the residences along Prospect Street that backed the Agawam Substation.

Four measurement points were picked to quantify the sound levels on either side of the Breckwood Substation (EFSB-NO-004 Attachment 1). Breckwood-04 was specifically chosen due to its proximity to the school.

Two measurement points were picked to quantify the sound levels near the Ludlow Substation (Figure 5-3 of Exhibit 5.6 of the Petition). MP2 was specifically chosen due to its proximity to the residences along Center Street.

Two measurement points were picked to quantify the sound levels near the Cadwell Switching Station (EFSB-NO-004 Attachment 2). Cadwell-01 was specifically chosen due to its proximity to the residences along Ingham Street.

Three measurement points were picked to quantify the sound levels near the Fairmont Switching Station (Figure 5-2 of Exhibit 5.6 of the Petition). MP2 was specifically chosen due to its proximity to the residences along Ingham Street.

Existing ambient noise levels are determined by measuring the sound level exceeded 90 percent of a specific time period (L_{90}). The measured L_{90} sound levels (dBA) in the direction of the closest residence to each facility were presented in the study, and are detailed in the two tables below (one table for substations and one table for switching stations). Multiple time periods were measured to capture any variations in the existing ambient sound levels.

Existing Ambient Noise at Substations (L_{90}, dBA)

Time Period	Agawam Substation (MP2)	Breckwood Substation (Breckwood-04)	Ludlow Substation (MP2)
Daytime	47.5	52.0	50.9
Nighttime	41.5	48.6	40.0
Nighttime	41.0	45.9	48.8
Daytime	47.1	50.4	48.8

Existing Ambient Noise at Switching Stations (L_{90}, dBA)

Time Period	Cadwell Switching Station (Cadwell-01)	Fairmont Switching Station (MP2)
Daytime	53.5	50.2
Nighttime	49.0	39.8
Nighttime	42.1	41.0
Daytime	52.7	48.9

The lowest measured daytime ambient sound level was 47.1 dBA and the lowest measured nighttime ambient sound level was 39.8 dBA. The sound level should not significantly vary from one house to the next since a large portion of the noise in these areas is directly attributable to vehicular traffic.

Various construction-related activities are expected to occur at different times. These activities were detailed in Section 5.5 of the Comparison of Proposed Facilities submitted to the EFSB. The activities that would occur at the facilities and would generate noise are presented below.

Construction Phase	Typical Equipment/Materials Required
Establish erosion and sediment controls	Pickup and other small trucks
Clear for new access roads or improve existing roads	• Flatbed truck • Brush hog • Bulldozer • Bucket trucks for canopy trimming • Wood chipper • Side booms, forklifts and cranes to handle materials
Construction of new access road or improve existing roads to provide a travel way of at least 15 to 20 feet in width	• Bulldozer or front loader • Pickup or stake body trucks for culverts, etc. • Dump trucks for crushed stone or gravel • Pickups or stake-body trucks for culverts • Mat installer for wetland mats • Roads may be wood, gravel, or matted; using culverts or crushed stone for wet areas; roads may be temporary or permanent. Roads must have sufficient width and capacity for heavy construction equipment, both over-the-road and off-road vehicles, including oversize tractor trailers. The need for access for flatbed trailers and concrete truck often determines the scope of access road improvements. Road grades must be negotiable for over-the-road trucks; 10 percent maximum, and less if wet weather or surface conditions provide traction problems. Vehicles with tracks or tires are used.
Preparation of staging and lay down areas if they are to be off the ROW	• Same equipment for access road construction will be used. • Establish field office trailers, sanitary facilities, and parking areas, as well locations for material and equipment storage.
Preparation of work area at sites of existing and new structures	• Same equipment for access road construction and staging area preparation will be used. • Reel trailers to haul out old conductors • Trucks to haul out old hardware • Flatbed trucks with a crane to remove structures • Trucks with welding equipment to cut steel supports or components • Dump trucks to haul smaller components
Construction of new line structures	• Same equipment for access road construction and staging area preparation will be used with addition of caissons for foundations, flatbed trucks for structure components, auger, excavator, cranes, other trucks for reinforcing rods, concrete trucks for structures requiring concrete pads or foundations, bucket trucks and hardware, conductor reels, and conductor pulling rigs. Dump trucks are needed for the foundation work if excess excavated material has to be removed from the ROW. In wet conditions or if groundwater is encountered, the water is pumped to a temporary settling basin with erosion and sedimentation controls including geotextile fabric, silt fence, hay bales and crushed stone. As with all other activities, this would have to comply with any applicable regulation.

Construction Phase	Typical Equipment/Materials Required
Removal of existing line structures	• Bucket trucks for dismantling existing lines, with reel trailers to capture and store old conductors, trucks to remove old hardware, flatbed truck with crane to remove structures, trucks with welding equipment to cut steel supports or components, stake or dump trucks to remove smaller components. To minimize wetland impacts or to access structures with challenging topography, helicopter may be used for removal.
Restoration	• Pickup and other small trucks. • All debris is to be removed from the ROW for disposal; but brush may be piled, scattered, or chipped. Disturbed ground is back bladed to its preconstruction contours unless directed otherwise. If the work site is in an agricultural field, the soil can be decompacted by disking. Erosion controls are left in place until vegetation is established. Steep areas are stabilized with jute netting or pre-made erosion control fabric containing seed, mulch, and fertilizer. Access roads where culverts or crushed stone fords were installed will be left in place or removed as directed by the regulatory authorities in accordance with permit/certificate conditions.

The impacts of these activities vary considerably based on the proximity of the residences to the activities. Generic sound data ranges are available for various types of equipment at certain distances. Since none of the equipment will operate directly on a residence, impact levels were calculated based on a residence being located approximately 50 feet from the construction activity. The table below lists generic activity and the associated sound levels at 50 feet.

Range of Typical Construction Equipment Noise (dBA) Values taken from FHWA Highway Construction noise (http://www.fhwa.dot.gov/environment/noise/highway/hcn06.htm) and the HEARS database.

Generic Construction Equipment	Minimum Noise at 50 feet	Maximum Noise at 50 feet
Backhoes	74	92
Compacters (Rollers)	73	76
Compressors	73	86
Concrete Mixers	76	88
Cranes (movable)	70	94
Dozers	65	95
Front Loaders	77	96
Generators	71	83
Graders	72	91
Jack Hammers and Rock Drills	80	98
Pavers	85	87
Pumps	69	71
Scrappers	76	95
Tractors	77	95
Trucks	83	96

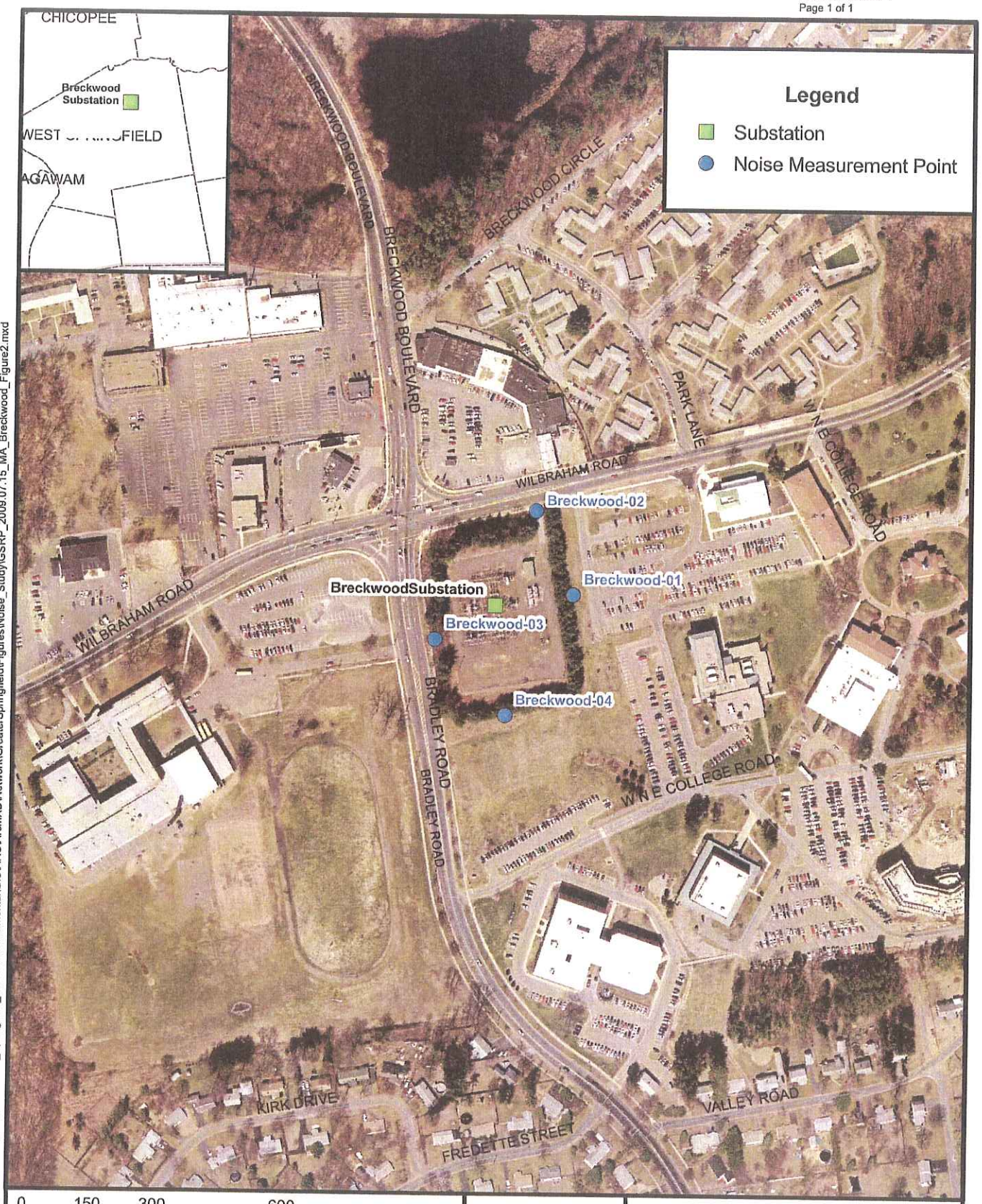
Construction at the substations and switching stations, and relocating the Fairmont Switching Station, will involve construction activities spread out over several months. The timing and intensity of these construction activities has not been determined. However, nearly all of these construction activities would occur on the property of the substation or switching station. The residences that would experience noise from these activities are all considerably farther away than 50 feet. Additional distance leads to significantly lower sound levels at the residences.

WMECO anticipates that sound levels at the residences from construction activities on the facility properties could be in the range of 75-85 dBA during the day. As most activities will occur during the day, nighttime sound levels would be the same as the existing ambient sound levels unless special circumstances require nighttime construction. The table below shows the lowest measured existing ambient sound levels and the potential construction noise levels that could be present at any of the facilities at any given time. To determine an overall sound level, the ambient sound level should be logarithmically added to the construction noise level. The formula for adding the sound levels is as follows:

$$Tot = 10*Log\ [10^{(Ambient/10)} + 10^{(Construction/10)}]$$

Time Period	Lowest Ambient	Potential Construction Noise	Total Sound Level During Construction
Daytime	47.1	85.0	85.0
Nighttime	39.8	65.0	65.0

Noise associated with the construction activities will have a temporary impact on the residences adjacent to the activities. The sounds will not be constant at 85 dBA (normally much lower); they will taper off as equipment gets farther away from the residences. Additionally, these sounds would only last a few months in most instances. Once construction activities have stopped, the sound levels near the residences would return to the existing ambient sound levels. Since none of the predicted changes to the facilities were predicted to cause significant increases to the sound levels in the surrounding community (see Exhibits 5.6 - Environmental Sound Assessment Study), there should be no lasting sound impacts near the substations or switching station.



Source: City of Springfield 2003 Aerials.

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SINCE 1898

Figure 2
Greater Springfield Reliability Project
Measurement Locations
Breckwood Substation

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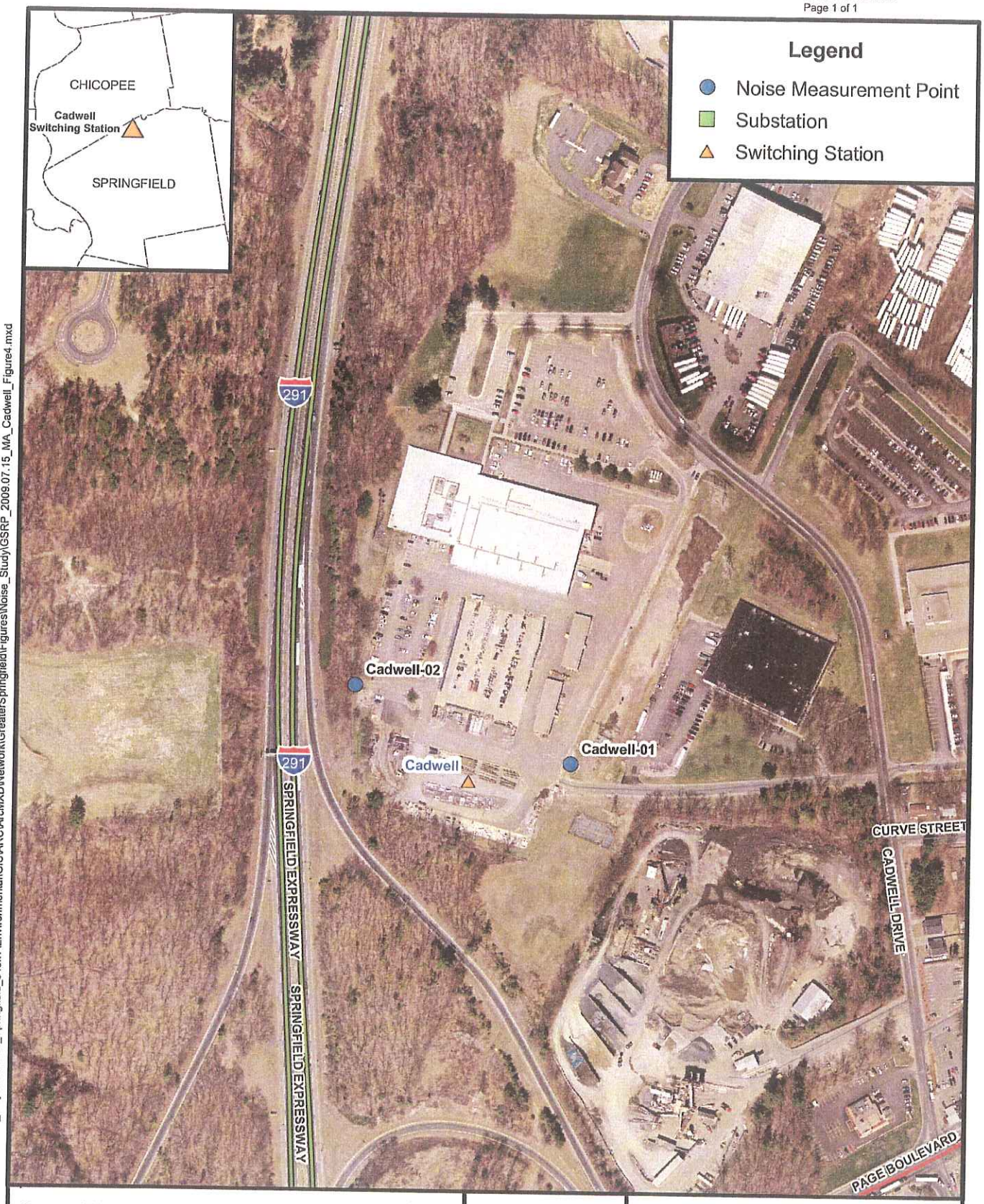

Source: City of Springfield 2003 Aerials.

Burns & McDonnell
SINCE 1898

Figure 4
Greater Springfield Reliability Project
Measurement Locations
Cadwell Switching Station

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Witness: **Scott Newland,Timothy Barton**
Request from: **Energy Facilities Siting Board**

Question:
Please refer to the Petition at 5-24. Please provide the basis for the assertion that along the northern route "construction activities are not expected to substantially affect the local noise environment"?

Response:

The statement "construction activities are not expected to substantially affect the local noise environment" is appropriate for the Project because any substantial changes to the local noise environment during construction would be temporary and kept to daytime hours as much as possible, and because construction noise at night tends to be more disruptive to residential neighbors. There may be times of increased sound levels due to the construction activities that may affect certain individuals. However, construction and maintenance work typically occurs between 7 A.M. and 7 P.M., Monday through Friday. Under certain circumstances, especially when circuit outages are required, night work and weekend work may be necessary. These activities would only occur for short periods of time and appropriate notice would be given to the residents. Once a specific construction activity is complete, there will inherently be no further noise associated with the activity. It was therefore concluded that, despite potential short-term impacts, that construction activities are not expected to substantially affect the local noise environment.

Witness: Scott Newland,Timothy Barton
Request from: Energy Facilities Siting Board

Question:
Please refer to the response to EFSB-NO-3. Based on the charts presented, please explain how the Company concluded that construction sound levels are expected to be in the 65-75 dBA range at distances greater than 50 feet away based on the minimum and maximum data for noise levels 50 feet away shown in the response.

Response:

The expected sound levels of 65-75 dBA at distances greater than 50 feet away were derived based the ranges for typical construction equipment in the noise level tables provided in the response to Information Request EFSB-N0-003 and experiences from similar projects. Calculating a singular value for construction noise is not only difficult, but generally inappropriate based on the nature of the sound sources. Ranges for sound levels were therefore provided. The range of typical construction equipment noises can vary significantly, as was shown in the tables. An extreme example of this was dozers which had a minimum noise level at 50 feet of 65 dBA and a maximum noise level at 50 feet of 95 dBA. The noise produced will vary with the size, age, and model of the dozer.

The sound-level data provided in tables also demonstrated how the sound levels are expected to decrease with distance. The sound levels at a distance are easily calculated for a stationary source of constant noise. However, most of the construction equipment is expected to be mobile and sporadic. As such, the construction equipment will produce varying levels of noise at a stationary sensitive noise receptor.

Sound over a specific period of time can be measured in many ways, but is usually measured as the equivalent sound level (L_{eq}) over the entire period. The ranges were therefore determined by looking at multiple scenarios where specific pieces of equipment (e.g., front-end loader, tractor, trucks, and a crane for one scenario) operated simultaneously at varying distances (since they won't be physically on top of each other). The highest expected values at a distance for various pieces of equipment operating simultaneously were calculated assuming attenuation only for distance. Attenuation due to atmospheric conditions and shielding, among other factors, was conservatively ignored. Since most of the equipment will be moving, there would be instantaneous sound levels higher than the ranges, and instantaneous sound levels lower than the ambient values when equipment is farther away from a specific receptor. The calculations for instantaneous construction sound levels fell within the range of 59-99 dBA at 100 feet. The highest value was calculated for every piece of equipment listed in tables for EFSB-NO-003 operating simultaneously at 100 feet. While this scenario could be considered worst case, it could never physically occur. The range presented in EFSB-NO-003 of 65-75 dBA was based on averages of the various scenarios that could actually occur during construction and the assumption that there will be additional attenuation due to shielding from terrain, buildings, vehicles and other factors that were not accounted for here. The range presented for construction sound levels at distances greater than 50 feet could have been wider, but most sound levels are expected to fall within the range of 65 – 75 dBA.

Witness: **Scott Newland,Timothy Barton**
Request from: **Energy Facilities Siting Board**

Question:
Please refer to the response to EFSB-NO-4. Based on the charts presented, please explain how the Company concluded that construction sound levels at the residences proximate to the substation properties are expected to be in the 75-85 dBA range. Based on the actual location of residences proximate to each facility, please provide specific data on the construction noise at each substation.

Response:

The expected sound levels of 75-85 dBA at the property line of the substations were derived based on range of typical construction equipment noise data provided in table for EFSB-NO-4 and experiences from similar projects. Calculating a singular value for construction noise is not only difficult, but generally inappropriate based on the nature of the sound sources. Ranges for sound levels were therefore provided. The range of typical construction equipment noises can vary significantly, as was shown in the table provided. An extreme example of this was dozers which had a minimum noise level at 50 feet of 65 dBA and a maximum noise level at 50 feet of 95 dBA. The noise produced will vary with the size, age, and model of the dozer.

The sound levels at a distance are easily calculated for a stationary source of constant noise. Construction activities at the substations will be different than construction activities along the right-of-way because the equipment will be more localized and won't move as far away from residences. Most of the construction equipment is expected to be mobile and sporadic, but concentrated on site. As such, the construction equipment will have varying impacts on a stationary sensitive noise receptor.

Sound over a specific period of time can be measured in many ways, but is usually measured as the equivalent sound level (L_{eq}) over the entire period. The ranges were therefore determined by looking at multiple scenarios where specific pieces of equipment (e.g., front-end loader, tractor, trucks, and a crane for one scenario) operated simultaneously at varying distances (since they won't be physically on top of each other). The highest expected values at a distance for various pieces of equipment operating simultaneously were calculated assuming attenuation only for distance. Attenuation due to atmospheric conditions and shielding, among other factors, was conservatively ignored. Since most of the equipment will be moving, there would be instantaneous sound levels higher than the range and instantaneous sound levels lower than the range. The calculations for instantaneous construction sound levels fell within the range of 59-99 dBA at 100 feet. The highest value was calculated for every piece of equipment listed in EFSB-NO-004 operating simultaneously at 100 feet. While this scenario could be considered worst case, it could never physically occur. The range presented in EFSB-NO-004 of 75-85 dBA was based on averages of the various scenarios that could actually occur during construction and the assumption that there will be additional attenuation due to shielding from terrain, buildings, vehicles and other factors that were not accounted for here. The range presented for construction sound levels at the substations should encompass most activities, but there will be times when the sound is higher or lower. This range is higher than the construction noise for the right-of-way activities because the construction equipment will be operating in one area.

To address the construction noise for every residence located adjacent to the substations would require knowing which activities are going to occur where and when they are to occur. The range was calculated such that it encompasses most scenarios at any substation. Therefore, the range presented could be applied at any residence near any of the substations.