STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

IN RE:

APPLICATION OF HOMELAND TOWERS, LLC AND NEW CINGULAR WIRELESS PCS, LLC d/b/a AT&T FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED FOR THE CONSTRUCTION, MAINTENANCE, AND OPERATION OF A TELECOMMUNICATIONS FACILITY AT ONE OF TWO SITES IN THE TOWN OF KENT, CONNECTICUT	DOCKET NO. 488 July 16, 2020

HOMELAND TOWERS, LLC AND NEW CINGULAR WIRELESS PCS, LLC d/b/a AT&T
SUPPLEMENTAL SUBMISSION

Homeland Towers, LLC and AT&T (the "Applicants") respectfully submit the following supplemental information to the Connecticut Siting Council in the above-referenced proceeding:

Supplemental Information Regarding Siting Council Interrogatory Response No. 27(A)

As indicated in the Applicants' response to Connecticut Siting Council Interrogatory No. 27A, noise studies of the proposed Site A and Site B facilities were conducted and are provided in Attachment 1. As set forth in the attached Environmental Sound Assessments, the noise associated with the operation of AT&T's proposed facility in conjunction with the Town of Kent's emergency communications equipment, will remain well below the CTDEEP and Kent standards. It is also noteworthy that the enclosed assessments demonstrate that under worst-case conditions, which include the operation of the cooling equipment and the emergency back-up generator simultaneously, the noise level will also comply with the sound level standards. As noted in the attached assessment, worst-case conditions are rare and would only occur if the emergency generator was tested on one of the hottest days of the summer when the cooler is operating.

Supplemental Public Need Documentation

Included in Attachment 2 are three RF maps showing 1) existing AT&T service at the -108 dBm level; 2) existing and proposed service from Site A Bald Hill Road at the -108 dBm level; and 3) existing and proposed service from Site B 93 Richards Road at the -108 dBm level. The attached RF maps are provided to show that AT&T's -108 dBm design threshold provides critical wireless service that will effectively carry calls and LTE data sessions in an outdoor environment Given the terrain in this area, the enclosed RF maps demonstrate that either proposed site addresses a public need to provide reliable wireless services, reliable public safety communications.

Responses to the Department of Transportation ("DOT") June 23, 2020 Comments

In response to the June 23, 2020 DOT comments, the Applicants note:

DOT: Docket 488 does not contain a site plans or disclosed the erosion and sedimentation control measures that would occur at Site B. It is recommended that the Homeland Towers, LLC and New

Cingular Wireless PCS, LLC adhere to the 2002 CT Guidelines for Soil Erosion & Sediment Control for Site B.

Response: *The drawings included in Application Attachment 5 include information regarding the erosion and sedimentation control measures for Site B. In addition, Application Attachment 7 notes that the sedimentation and erosion controls will be designed, installed and maintained during construction activities in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control.*

DOT: Additionally, stormwater impact was not disclosed in the supplemental document and Site B discussed the removal of 7 trees with no indication of replacement/landscaping plan.

Response: *The drawings included in Application Attachment 5 include information regarding stormwater and proposed landscaping for Site B.*

DOT: Finally, both Site A (Bald Hill Road) and Site B (93 Richards Road) indicated the installation of an emergency backup diesel generator. It is recommended that the applicant have double/spill containment- if possible and/or an emergency spill kit at the site location. Please see attached D.O.T. Screening Checklist.

Response: *Please see Applicants' Responses to Siting Council Interrogatories, Response A42, dated July 16, 2020 regarding the spill containment for the proposed generator at Site A and Site B.*

CERTIFICATE OF SERVICE

I hereby certify that on this day the foregoing was sent electronically to the Connecticut Siting Council and to the service list below with one hard copy sent to the Connecticut Siting Council via first class mail in accordance with Connecticut Siting Council directives:

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July 16, 2020

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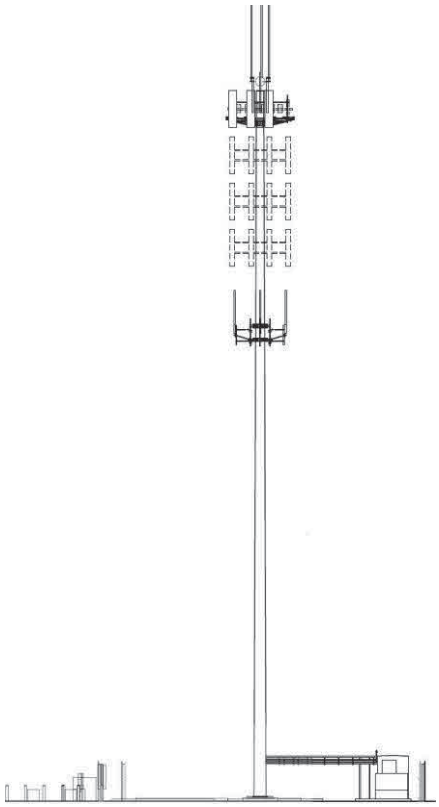
ATTACHMENT 1

Environmental Sound Assessment



Wireless Communication Facility
CT757 Kent
New Monopole
Bald Hill Road, Kent, CT 06785

June 29, 2020

Prepared For:

AT&T Wireless
550 Cochituate Road
Suites 13 & 14
Framingham, MA 01701

Prepared By:

Modeling Specialties
30 Maple Road
Westford, MA 01886

ENVIRONMENTAL NOISE EVALUATION

AT&T Mobility is developing a Wireless Communications Facility in Kent Connecticut to support personal wireless communication in the area. The proposed AT&T Wireless antennas will be mounted on a new monopole structure. The facility will also support the Town's antennas and is designed to support 3 additional carriers. Environmentally sensitive electronic equipment will be enclosed in cabinets at the foot of the structure. A small door-mounted cooler unit will be mounted on the AT&T cabinet, typically producing no sound, but will produce sound when it is actively protecting the equipment. Both AT&T and the town will have emergency generators within the fenced equipment compound at the foot of the tower. The generators will operate only during emergencies and for occasional daytime testing of about one-half hour.

This report addresses land uses in the area, measured ambient sound levels in the area, sources expected at this installation and resulting sound levels at area sensitive locations.

Overview of Project and Site Vicinity

The project is located within a parcel that is currently undeveloped. Ambient sound levels were established by field measurements. The sound levels resulting from the proposed equipment were estimated using vendor data and measurements made at similar installations. Plans issued by Homeland Towers / AT&T / All-Points Technology Corp. dated January 28, 2020 provided the necessary information to support the evaluation of project sounds. The corresponding sound levels expected at the nearby sensitive locations were estimated using noise modeling techniques prescribed in acoustical literature.

Figure 1 has a backdrop of Google aerial imagery and is annotated to show the proposed site, surrounding area and nearby receptor locations, showing the orientation and distance from the proposed equipment to the receptor locations.

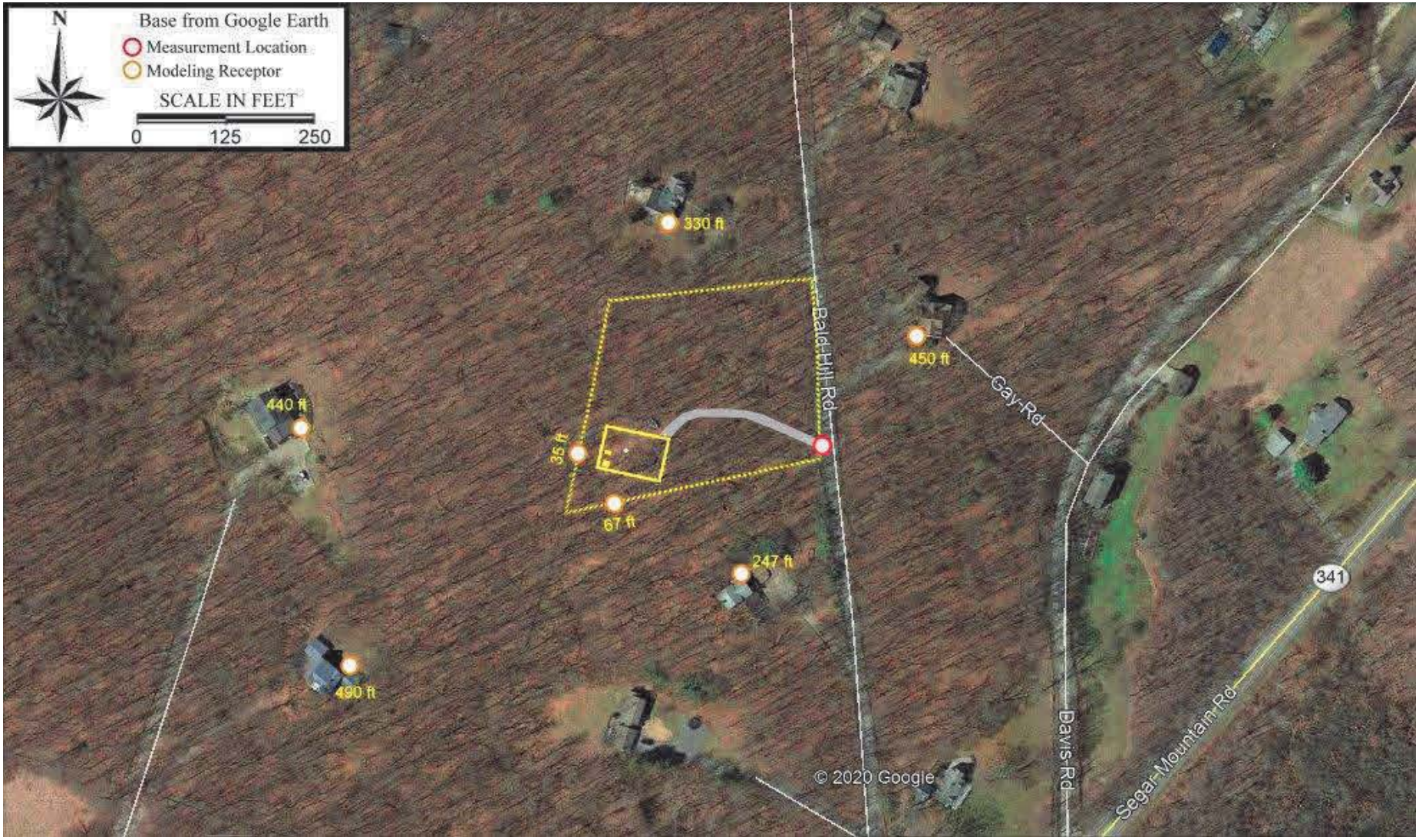


Figure 1: Project Area Showing the Site, Nearby Features and Modeled Sensitive Receptors

Discussion of General Noise Analysis Methods

There are a number of ways in which sound (noise) levels are measured and quantified. All of them use the logarithmic decibel (dB) scale. Following is a brief introduction to the noise measurement terminology used in this assessment.

Noise Metrics

The Sound Level Meter used to measure environmental sound is a standardized instrument.[1] It contains "weighting networks" to adjust the frequency response of the instrument to approximate that of the human ear under various circumstances. One of these is the *A-weighting* network. A-weighted sound levels emphasize the middle frequency sounds and de-emphasize lower and higher frequency sounds; they are reported in decibels designated as "dBA." All broadband levels represented in this study are weighted using the A-weighting scale.

The sounds in our environment usually vary with time so they cannot always be described with a single number. Two methods are used for describing variable sounds. These are *exceedance levels* and *equivalent level.* Both are derived from a large number of moment-to-moment A-weighted sound level measurements. Exceedance levels are designated L_n, where "n" can have any value from 0 to 100 percent. For example:

- L_{10} is the sound level in dBA exceeded only 10 percent of the time. It is close to the maximum level observed during the measurement period. The L_{10} is sometimes called the *intrusive* sound level because it is caused by occasional louder noises like those from passing motor vehicles.

- L_{50} is the median sound level: the sound level in dBA exceeded 50 percent of the time during the measurement period.

- L_{90} is the sound level in dBA exceeded 90 percent of the time during the measurement period. The L_{90} is close to the lowest sound level observed. It is essentially the same as the *residual* sound level, which is the sound level observed when there are no loud, transient noises.

By using exceedance levels, it is possible to separate steady sounds (L_{90}) from occasional louder sounds (L_{10}) in the environment. The *equivalent level* is the level of a hypothetical steady sound that has the same energy as the actual fluctuating sound observed. The equivalent level is designated L_{eq}, and is also A-weighted. The equivalent level is strongly influenced by occasional loud, intrusive noises. When a steady sound is observed, all of the L_n and L_{eq} are equal.

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In the design of noise control treatments, it is essential to know something about the frequency spectrum of the sound of interest. Noise control treatments do not function like the human ear, so simple A-weighted levels are not useful for noise-control design or the identification of tones. The spectra of sounds are usually stated in terms of *octave band sound pressure levels*, in dB, with the octave frequency bands being those established by standard.[2] The sounds at the proposed site have been evaluated with respect to the octave band sound pressure levels, as well as the A-weighted equivalent sound level. Only the A-weighted values are presented here, since they represent the more easily recognized sound scale.

Noise Regulations and Criteria

Sound compliance is judged on two bases: the extent to which governmental regulations or guidelines are met, and the extent to which it is estimated that the community is protected from the excessive sound levels. The governmental regulations that may be applicable to sound produced by activities at the project site are summarized below.

Federal

- Occupational Noise Exposure Standards: 29 CFR 1910.95. This regulation restricts the noise exposure of employees at the workplace as referred to in OSHA requirements. Workers will not routinely attend this facility so this is not applicable to the project. Furthermore, this study demonstrates the facility will only emit infrequent sounds of modest levels that would comply with these requirements.

State

- The state of Connecticut (Connecticut Department of Energy & Environmental Protection or CTDEEP) regulates noise at Regulation Title 22a, Sections 69-1 through 69-7.4, Control of Noise. The project is a Class B (Utility - Communications) emitter. The land use is Utility in a residential Zone 2A. The site is surrounded by residential land whose property lines were evaluated as Class A Noise Receptors. The details of the CTDEEP performance criteria are shown in Table 1 below and are based on the source and receiving land uses. An excerpt from the Town of Kent Zoning Map is shown in Figure 2.

Table 1: Overview of CTDEEP Performance Criteria

	Receptor's Zone			
Emitter's Zone	Industrial	Commercial	Residential/Day	Residential/Night
Residential	62 dBA	55 dBA	55 dBA	45 dBA
Commercial	62 dBA	62 dBA	55 dBA	45 dBA
Industrial	70 dBA	66 dBA	61 dBA	51 dBA

[2] *American National Standard Specification for Octave, Half-octave and Third-octave Band Filter Sets*, ANSI S1.11-1966(R1975).

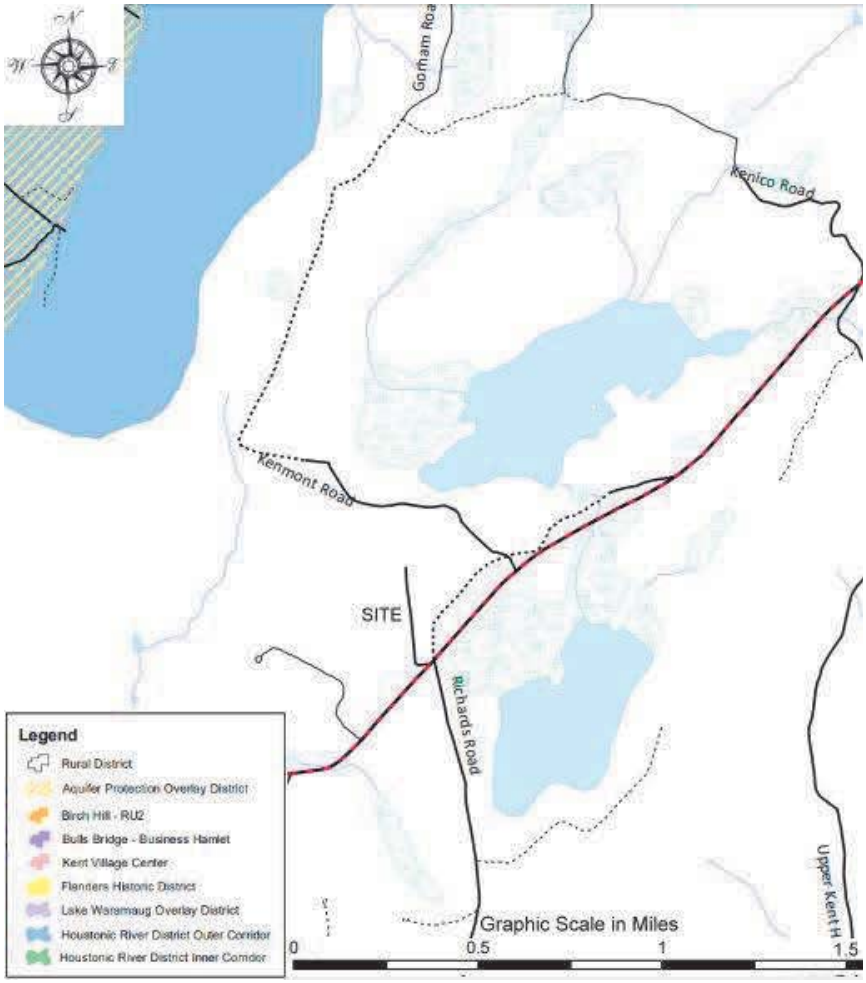


Figure 2: Excerpt of the Kent Online Zoning Map

Local

- The Kent Zoning Regulations Chapter 17 Section 4.3 provides limits to volume, duration, frequency or shrillness of sound transmitted outside the property from which it originates. "In no case shall such noise exceed 80 decibels during the daylight hours or 55 decibels from 10 PM to 7 AM, measured at any lot line…"

  Chapter 25 addresses Special Permit requirements specific to Telecommunications facilities. Section 7.13 provides requirements that project sources are sited and/or insulated to control sound that can be measured at the property line based on the ambient sound level. It also provides filing requirements for measured sounds.

Existing Community Sound Levels

The area has a rural residential character. The nearest sensitive receptors (residences) are located on adjacent lots in various directions from the equipment. Sound level measurements were made at the site access drive to establish the background sound levels for the area on April 22, 2020. The ambient sound typically fluctuates through the day and night. This facility has no significant sources of nighttime sound, so only a

daytime survey was conducted at the site. A new source of sound tends to be noticed most during conditions that are otherwise quiet. Because of this, the ambient sound survey was scheduled under conditions associated with quiet sound levels for the area.

The conditions at the time of the survey were exaggerated due to stay-at-home orders in place as a result of the COVID-19 emergency. The only sounds were from very few vehicles on local roadways and what sounded like distant lawn maintenance activities. No sounds were noted at or near the proposed site.

Attended sound level measurements were made using a Rion NA-28 sound level meter. The measurements create a baseline community sound level and captured the frequency-specific character of the sound. The meter was mounted on a tripod approximately 5 feet above the ground. The microphone was fitted with factory recommended foam windscreen. The meter was programmed to take measurements for 20 minutes and then store processed statistical levels. The meter meets the requirements of ANSI S1.4 Type 1 – Precision specification for sound level meters. The meter was calibrated in the field using a Larsen Davis Cal-250 acoustical calibrator before and after the sessions. The field calibrations indicated that the meters did not drift during the study. The spectrum analyzer complies with the requirements of the ANSI S1-11 for octave band filters.

Results of the Ambient Survey

The results of the ambient sound level measurements are summarized in Table 2. The Leq represents the "average" sound level of the fluctuating ambient sound while the L_{90} represents the "near quietest" level in the measured sample. Both are shown in this study to characterize the existing sound field. Comparing the Leq levels (including all sounds) to the L90 levels (quietest 10% of samples) illustrates the way fluctuating levels affect the measured ambient. Ambient levels are affected by community conditions, meteorology, seasons, insects and traffic patterns. The measurements indicate that the existing nighttime sound levels are currently within the residential target levels of the CTDEEP standards for daytime sound standards (55 dBA). Because of the seasonal and weather conditions of the survey, the measured levels exclude precipitation, significant wind, insects and traffic peaks.

Table 2: Ambient Sound Level Measured on November 22, 2019

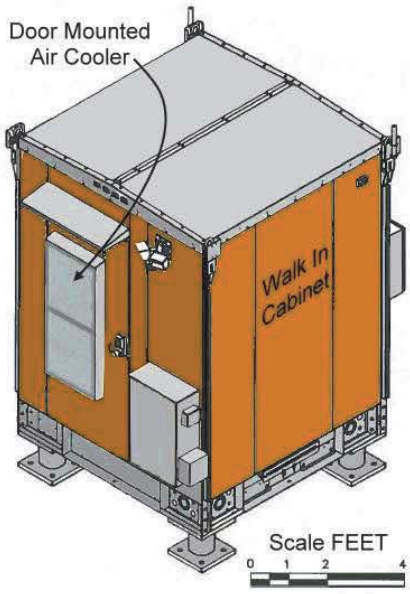
Location	Time	Period	L_{eq}	L_{90}
Site Drive	10:30 AM	Day	40 dBA	28 dBA

In most residential communities, the daytime is affected by more traffic volume on local and distant roadways along with local daytime activities. Nighttime levels tend to be lower because of lower traffic volumes and the lack of neighborhood activities. Nighttime ambient levels were not included in this study because the project does not include any expected nighttime sound sources.

Sounds from the Proposed Installation

The proposed installation has been designed to minimize the effect on the sound environment. Most of the equipment planned for the installation will produce no sound. Sounds that will be produced by the equipment will be significantly mitigated to manage any effects at sensitive locations. This analysis represents the most likely sound levels to be expected as a result of the normal operation of the equipment using data from potential equipment vendors and measurements of other similar equipment. Details of the modeling and assumptions are provided below. The proposed equipment will include antennas on the monopole and cable trays that support necessary cabling. None of this equipment will produce environmental sound. As noted above, there are only two proposed sources of sound related to this project. The cabinet coolers and standby generators to provide system power during periods when utility support is lost. The equipment is described and quantified below:

Environmental Control Equipment. A walk-in cabinet will be located in the fenced compound at the base of the utility structure. The cabinet will house AT&T equipment that is environmentally sensitive. The proposed Vertiv cabinet has two ways to provide cooling. Multiple fans move filtered ambient air through the front wall and out the back wall. Their speed and corresponding sound level vary based on how much cooling is needed. The ventilation system provides adequate cooling except when the ambient temperature is very high. When needed the door-mounted cooler provides additional support. The highest operational sound levels are expected in the hottest days of summer when the cooler is active. It is noted that the system has a heating mode with minimal interaction with the outdoors, so is not associated with community sound.



Non-Routine Sound Emissions

The installation will include a horizontally configured propane generator installed inside a separate enclosure. It is a DC generator, which dramatically changes the way that it supports the facility. The generator will only operate to the level demanded by the load. Occasionally, the engine will be remotely tested to assure availability. But since it will have no load, the unit will operate at little more than an idle during the test. The sound level associated with the generator test is expected to be in the mid 50's dBA at 23 feet from the unit. Full load and emergency operation of the Polar generator is rated at 62 dBA at 23 feet from the unit.

The AT&T equipment is monitored remotely, so attended service will be infrequent. Only during an emergency or during an attended performance test will the unit operate under load. A full load test requires a service technician to physically attach a load bank to assure that all design loads are available, so it is considered an upset condition.

The Town of Kent proposes to use a Generac Guardian series generator to support its equipment. This a common residential (whole house) generator choice. The unit is expected to be about 20 kW capacity fueled by propane. The fuel details are not shown in Figure 2 as the details were not available at the time of this analysis. Like the Polar unit, its quiet design and low profile reduce its potential offsite sound. Its emergency operation is rated for 67 dBA at 23 feet. But for routine testing under no load, it is rated at 55 dBA.

Equipment Sound Level Modeling

A computer model was developed for the project sounds based on conservative sound propagation principles prescribed in acoustics literature. Each of the expected sources during operation of the facility were identified and quantified, then estimated at the nearest sensitive receptors. Sound levels decrease with distance, so the resulting sound level will be lower at more distant locations. The sound modeling accounts for specific source and propagation path assumptions for each modeled receiver location.

Sound level prediction modeling was performed using CADNA software under downwind weather conditions as assumed in the standard ISO 9613-2. Table 3 summarizes the modeling input parameters.

Table 3: Modeling Input Parameters

Item	Modeling Input and Description
Terrain	Flat Terrain assumed
Temperature	10°C
Relative Humidity	70%
Weather Condition	6.5 mph, directly from facility to receptor*
Ground Attenuation	0.2, hard surface (0.5 = soft ground, 0.0 = pure reflection)
Atmospheric Inversion	CONCAWE – Category F**
# of Sound Reflections	2
Receptor Height	1.5 meter above ground level

** Propagation calculations incorporate the adverse effects of certain atmospheric and meteorological conditions on sound propagation, such as gentle breeze of 1 to 5 m/s (ISO 1996-2: 1987) from source to receiver.*
***CONCAWE – Category F indicates an atmosphere that promotes sound propagation.*

Some receptors are line-of-sight to the equipment, so no terrain effects were included in any modeling. The proposed equipment layout plan is shown in Figure 3. The 6-foot fence is assumed to be chain link or other acoustically transparent deign. An elevation drawing of the compound is shown in Figure 4.

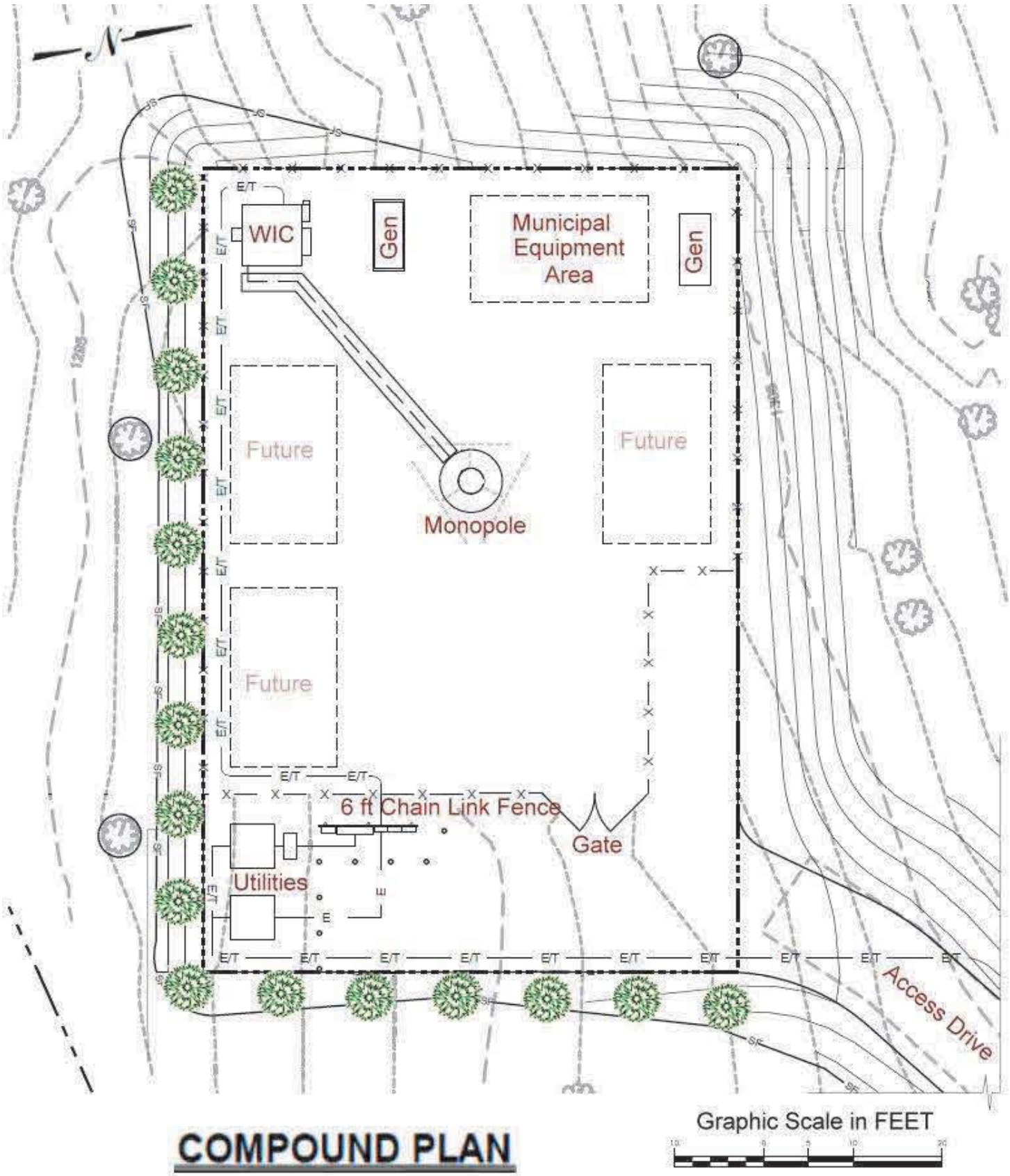


Figure 3: Plan Showing the Proposed Layout of the Equipment Compound

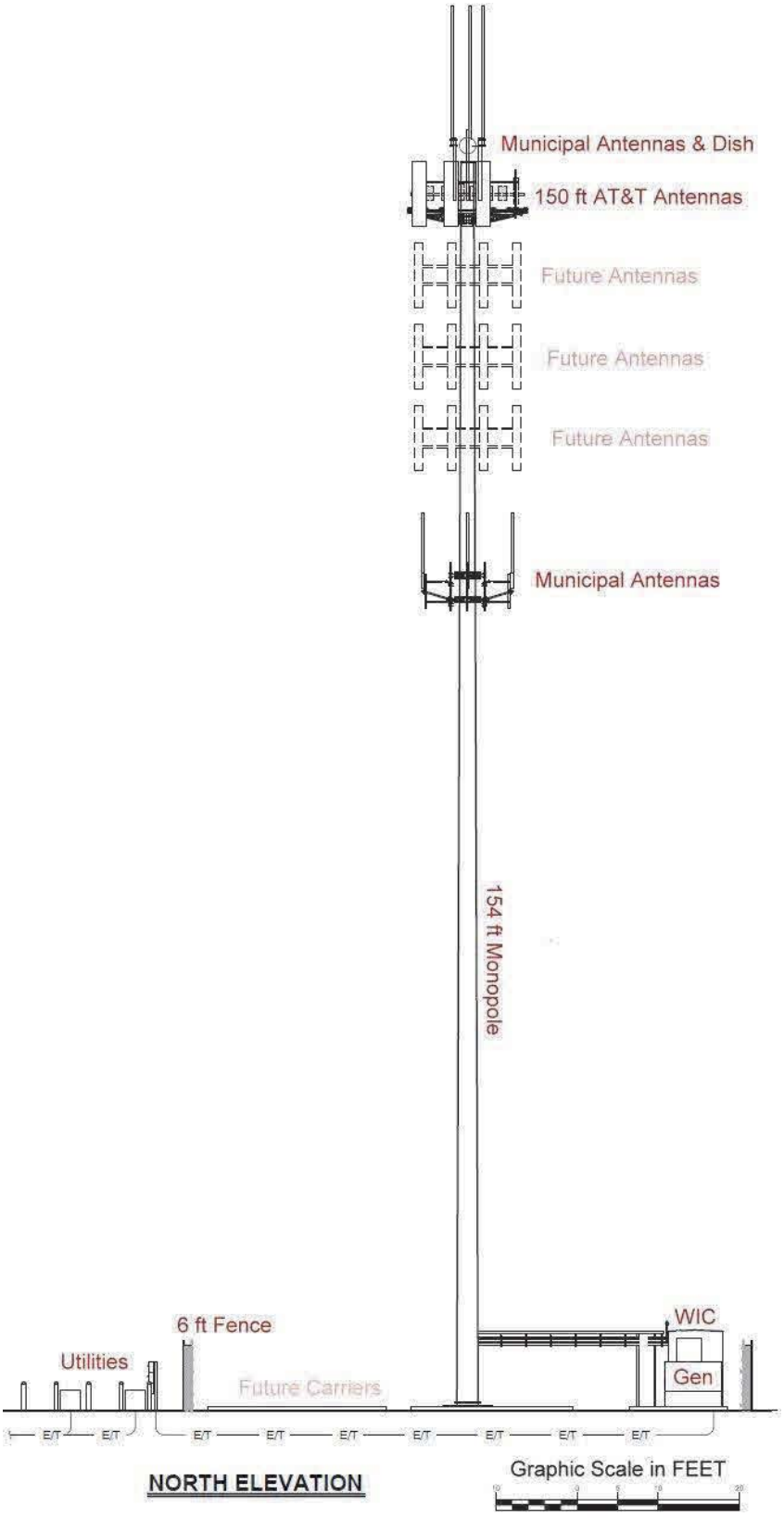


Figure 4: Plan Showing the Proposed Elevation Character of the Project

Results of Sound Level Modeling

The routine operation of the facility is not expected to include the cabinet cooler or generator, so emits only fan sounds when modest cooling is needed. To calculate the effect of the facility under the worst-case conditions, the sounds from the cabinet cooler plus generators are modeled together at receptor locations. The site location, receptors and their orientation to the proposed equipment were shown in Figure 1. The results of the worst-case modeling are shown in Table 4. Like air conditioning units in the surrounding community, the need for the supplemental cooler is expected to be limited to the warmest summer days under direct sunlight conditions. The cooler and generator test might never operate together as modeled in this worst-case scenario.

Table 4: Predicted Worst-Case Sound Levels Expected at Receptors

Receptor Location	Distance (ft) (from Source)	Ambient Level Day (dBA L_{eq})	Sound Level Standard (dBA)	Cooler+ Generator W/C Level
P/L, South	67	40	55	49 dBA
P/L, West	35	40	55	54 dBA
Residence, Southeast	247	40	55	38 dBA
Residence, Southwest	490	40	55	33 dBA
Residence, West	440	40	55	33 dBA
Residence, North	330	40	55	36 dBA
Residence, Northeast	700	40	55	30 dBA
Residence, East	450	40	55	33 dBA

Note: It is customary to conduct all calculations using precise values, but to round the result to whole dBA. All results are rounded to units (dBA).

Sound Mitigation Assumptions

There are several notable mitigation measures in place to achieve the low sound levels shown above. The selection of the walk-in cabinet reduces the size and sound levels associated with full size shelters. The cabinet is oriented to emit sound in a direction that minimizes sound at the most exposed property line. The cabinet cooling system uses fans to move fresh air through the cabinet for cooling under most conditions. Only for the period when the heat load exceeds the fan cooling capacity, does a door mounted cooler operate. The generators were selected from "quietest design" units that are available to support AT&T and Town of Kent project electronics. The lower sound levels are a result of the genset full enclosures, low profiles and quiet-test features. As a comparison, most mobile gasoline fired generators sized to support a residence would operate at 70 dBA or more at 23 feet. The routine tests of project generators are expected to emit about 55 dBA at the same reference distance.

Various generator configurations and mitigation options were evaluated as part of this study. Secondary enclosures or other external features for louder gensets could achieve the same level of compliance at regulated receptors. The planned equipment and configuration were specifically selected to meet the criteria using mitigation features designed into the chosen generator sets.

Conclusions

The potential sounds from the proposed installation were evaluated using measured field levels, vendor data and numerical modeling methods. Most of the time, the proposed wireless facility will produce no sound. The ambient sound level was established to be 40 dBA during the daytime. The only routine sound is from the cabinet ventilation which is expected to be about the ambient level at the nearest residential property lines. A supplementary cabinet cooler is expected to operate only during the daytime under summertime highest ambient temperatures.

Infrequently, the proposed facility will include the sound from testing the emergency generator(s). This infrequent daytime testing was modeled to include the combined sound from cooler and both the AT&T and Town of Kent generators simultaneously. This represents a worst-case estimate, which could only happen during the few hottest days of the summer. The graphical modeling summary in Figure 5 shows the results at the applicable residential property lines. The Figure also shows the lower sound levels expected at the existing residences on those same parcels.

The results of this expert analysis indicate the facility will comply with all federal and state requirements with respect to project sound at residential receptors.

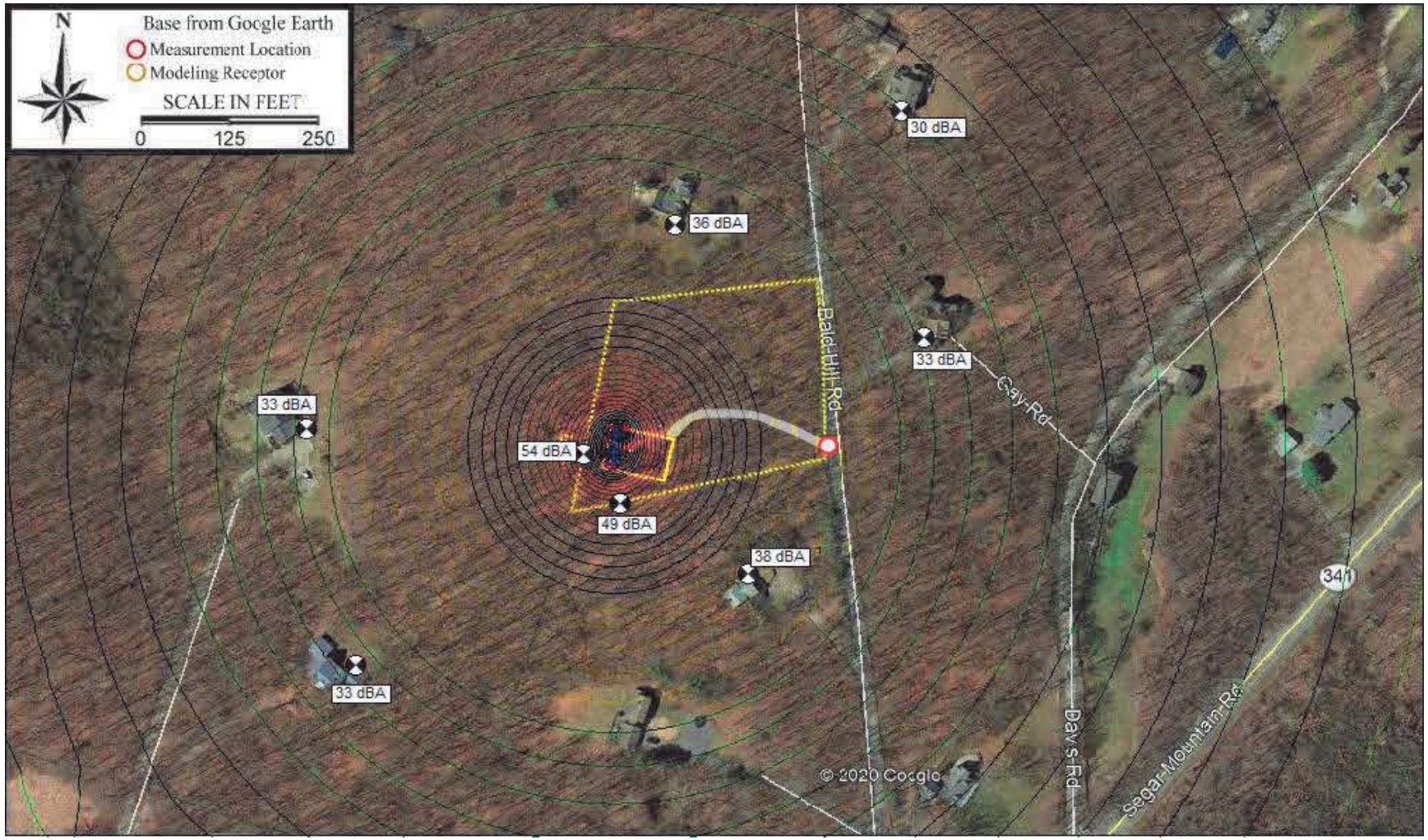
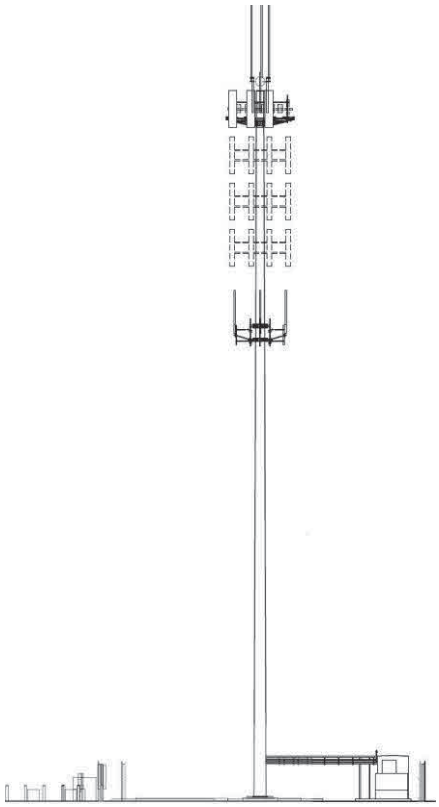


Figure 5: Graphical Summary of the Modeling Results Under Worst-Case Daytime Operating Conditions

Environmental Sound Assessment



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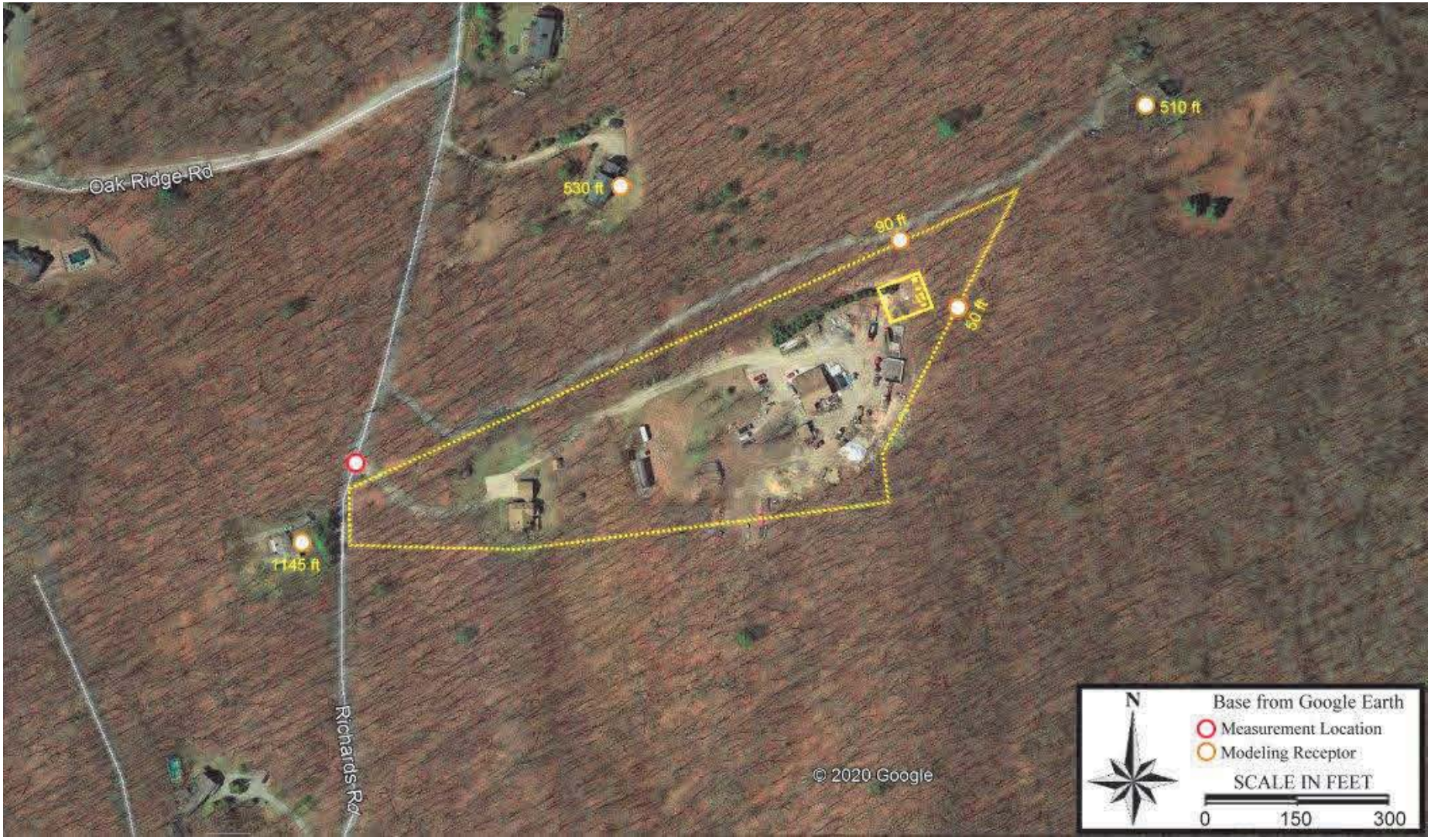

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Sound compliance is judged on two bases: the extent to which governmental regulations or guidelines are met, and the extent to which it is estimated that the community is protected from the excessive sound levels. The governmental regulations that may be applicable to sound produced by activities at the project site are summarized below.

Federal

- Occupational Noise Exposure Standards: 29 CFR 1910.95. This regulation restricts the noise exposure of employees at the workplace as referred to in OSHA requirements. Workers will not routinely attend this facility so this is not applicable to the project. Furthermore, this study demonstrates the facility will only emit infrequent sounds of modest levels that would comply with these requirements.

State

- The state of Connecticut (Connecticut Department of Energy & Environmental Protection or CTDEEP) regulates noise at Regulation Title 22a, Sections 69-1 through 69-7.4, Control of Noise. The project is a Class B (Utility - Communications) emitter. The land use is Utility in a residential Zone 2A. The site is surrounded by residential land whose property lines were evaluated as Class A Noise Receptors. The details of the CTDEEP performance criteria are shown in Table 1 below and are based on the source and receiving land uses. An excerpt from the Town of Kent Zoning Map is shown in Figure 2.

Table 1: Overview of CTDEEP Performance Criteria

	Receptor's Zone			
Emitter's Zone	Industrial	Commercial	Residential/Day	Residential/Night
Residential	62 dBA	55 dBA	55 dBA	45 dBA
Commercial	62 dBA	62 dBA	55 dBA	45 dBA
Industrial	70 dBA	66 dBA	61 dBA	51 dBA

[2] *American National Standard Specification for Octave, Half-octave and Third-octave Band Filter Sets*, ANSI S1.11-1966(R1975).

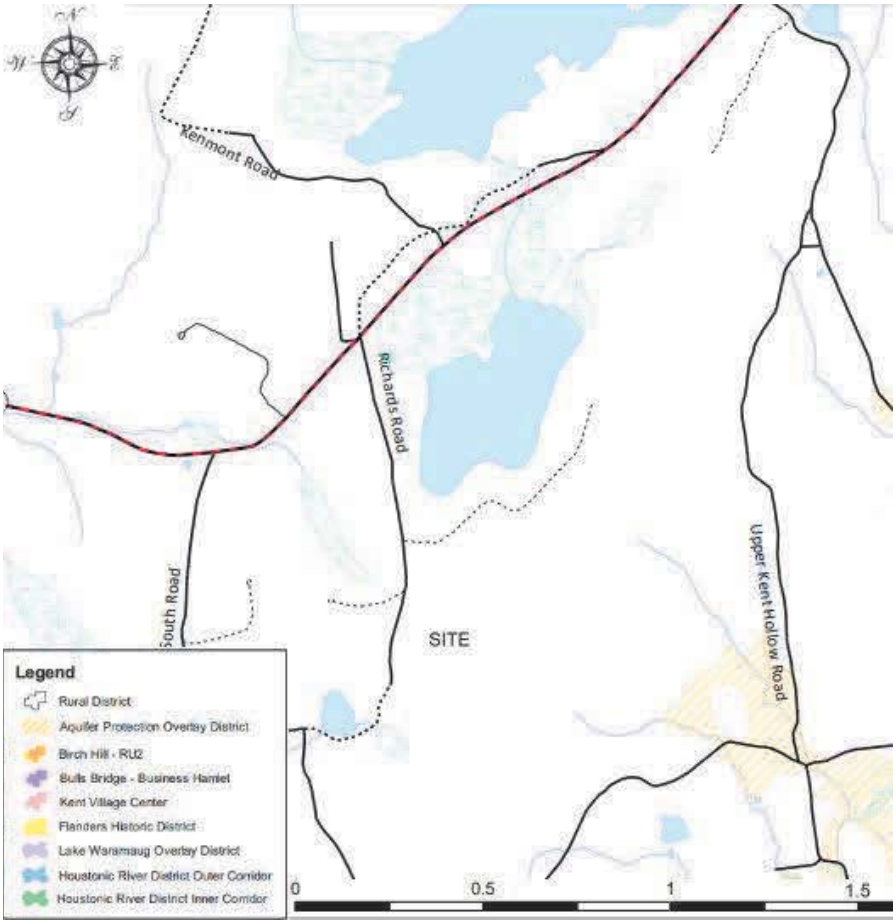


Figure 2: Excerpt of the Kent Online Zoning Map

Local

- The Kent Zoning Regulations Chapter 17 Section 4.3 provides limits to volume, duration, frequency or shrillness of sound transmitted outside the property from which it originates. "In no case shall such noise exceed 80 decibels during the daylight hours or 55 decibels from 10 PM to 7 AM, measured at any lot line…"

  Chapter 25 addresses Special Permit requirements specific to Telecommunications facilities. Section 7.13 provides requirements that project sources are sited and/or insulated to control sound that can be measured at the property line based on the ambient sound level. It also provides filing requirements for measured sounds.

Existing Community Sound Levels

The area has a rural residential character. The nearest sensitive receptors (residences) are located on adjacent lots in various directions from the equipment. Sound level measurements were made at the site access drive to establish the background sound levels for the area on April 22, 2020. The ambient sound typically fluctuates through the day and night. This facility has no significant sources of nighttime sound, so only a daytime survey was conducted at the site. A new source of sound tends to be noticed

most during conditions that are otherwise quiet. Because of this, the ambient sound survey was scheduled under conditions associated with quiet sound levels for the area.

The conditions at the time of the survey were exaggerated due to stay-at-home orders in place as a result of the COVID-19 emergency. The only sounds were from very few vehicles on local roadways and what sounded like distant lawn maintenance activities in several directions. No sounds were noted at or near the proposed site.

Attended sound level measurements were made using a Rion NA-28 sound level meter. The measurements create a baseline community sound level and captured the frequency-specific character of the sound. The meter was mounted on a tripod approximately 5 feet above the ground. The microphone was fitted with factory recommended foam windscreen. The meter was programmed to take measurements for 20 minutes and then store processed statistical levels. The meter meets the requirements of ANSI S1.4 Type 1 – Precision specification for sound level meters. The meter was calibrated in the field using a Larsen Davis Cal-250 acoustical calibrator before and after the sessions. The field calibrations indicated that the meters did not drift during the study. The spectrum analyzer complies with the requirements of the ANSI S1-11 for octave band filters.

Results of the Ambient Survey

The results of the ambient sound level measurements are summarized in Table 2. The Leq represents the "average" sound level of the fluctuating ambient sound while the L_{90} represents the "near quietest" level in the measured sample. Both are shown in this study to characterize the existing sound field. Comparing the Leq levels (including all sounds) to the L90 levels (quietest 10% of samples) illustrates the way fluctuating levels affect the measured ambient. Ambient levels are affected by community conditions, meteorology, seasons, insects and traffic patterns. The measurements indicate that the existing nighttime sound levels are currently within the residential target levels of the CTDEEP standards for daytime sound standards (55 dBA). Because of the seasonal and weather conditions of the survey, the measured levels exclude precipitation, significant wind, insects and traffic peaks.

Table 2: Ambient Sound Level Measured on November 22, 2019

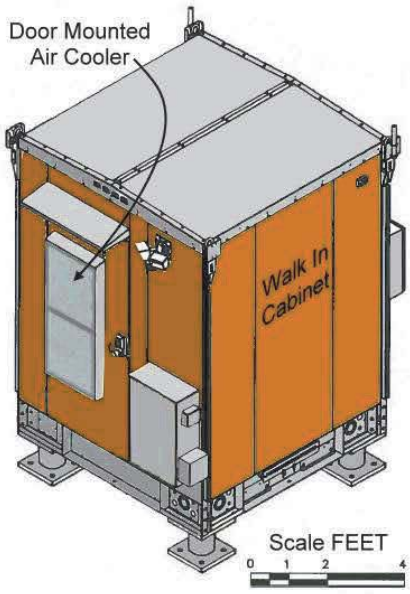
Location	Time	Period	L_{eq}	L_{90}
Site Drive	11:15 AM	Day	46 dBA	36 dBA

In most residential communities, the daytime is affected by more traffic volume on local and distant roadways along with local daytime activities. Nighttime levels tend to be lower because of lower traffic volumes and the lack of neighborhood activities. Nighttime ambient levels were not included in this study because the project does not include any expected nighttime sound sources.

Sounds from the Proposed Installation

The proposed installation has been designed to minimize the effect on the sound environment. Most of the equipment planned for the installation will produce no sound. Sounds that will be produced by the equipment will be significantly mitigated to manage any effects at sensitive locations. This analysis represents the most likely sound levels to be expected as a result of the normal operation of the equipment using data from potential equipment vendors and measurements of other similar equipment. Details of the modeling and assumptions are provided below. The proposed equipment will include antennas on the monopole and cable trays that support necessary cabling. None of this equipment will produce environmental sound. As noted above, there are only two proposed sources of sound related to this project. The cabinet coolers and standby generators to provide system power during periods when utility support is lost. The equipment is described and quantified below:

Environmental Control Equipment. A walk-in cabinet will be located in the fenced compound at the base of the utility structure. The cabinet will house AT&T equipment that is environmentally sensitive. The proposed Vertiv cabinet has two ways to provide cooling. Multiple fans move filtered ambient air through the front wall and out the back wall. Their speed and corresponding sound level vary based on how much cooling is needed. The ventilation system provides adequate cooling except when the ambient temperature is very high. When needed the door-mounted cooler provides additional support. The highest operational sound levels are expected in the hottest days of summer when the cooler is active. It is noted that the system has a heating mode with minimal interaction with the outdoors, so is not associated with community sound.



Non-Routine Sound Emissions

The installation will include a horizontally configured propane generator installed inside a separate enclosure. It is a DC generator, which dramatically changes the way that it supports the facility. The generator will only operate to the level demanded by the load. Occasionally, the engine will be remotely tested to assure availability. But since it will have no load, the unit will operate at little more than an idle during the test. The sound level associated with the generator test is expected to be in the mid 50's dBA at 23 feet from the unit. Full load and emergency operation of the Polar generator is rated at 62 dBA at 23 feet from the unit.

The AT&T equipment is monitored remotely, so attended service will be infrequent. Only during an emergency or during an attended performance test will the unit operate under load. A full load test requires a service technician to physically attach a load bank to assure that all design loads are available, so it is considered an upset condition.

The Town of Kent proposes to use a Generac Guardian series generator to support its equipment. This a common residential (whole house) generator choice. The unit is expected to be about 20 kW capacity fueled by propane. The fuel details are not shown in Figure 2 as the details were not available at the time of this analysis. Like the Polar unit, its quiet design and low profile reduce its potential offsite sound. Its emergency operation is rated for 67 dBA at 23 feet. But for routine testing under no load, it is rated at 55 dBA.

Equipment Sound Level Modeling

A computer model was developed for the project sounds based on conservative sound propagation principles prescribed in acoustics literature. Each of the expected sources during operation of the facility were identified and quantified, then estimated at the nearest sensitive receptors. Sound levels decrease with distance, so the resulting sound level will be lower at more distant locations. The sound modeling accounts for specific source and propagation path assumptions for each modeled receiver location.

Sound level prediction modeling was performed using CADNA software under downwind weather conditions as assumed in the standard ISO 9613-2. Table 3 summarizes the modeling input parameters.

Table 3: Modeling Input Parameters

Item	Modeling Input and Description
Terrain	Flat Terrain assumed
Temperature	10°C
Relative Humidity	70%
Weather Condition	6.5 mph, directly from facility to receptor*
Ground Attenuation	0.2, hard surface (0.5 = soft ground, 0.0 = pure reflection)
Atmospheric Inversion	CONCAWE – Category F**
# of Sound Reflections	2
Receptor Height	1.5 meter above ground level

** Propagation calculations incorporate the adverse effects of certain atmospheric and meteorological conditions on sound propagation, such as gentle breeze of 1 to 5 m/s (ISO 1996-2: 1987) from source to receiver.*
***CONCAWE – Category F indicates an atmosphere that promotes sound propagation.*

Some receptors are in line-of-site exposure to the equipment, so no terrain effects were included in the modeling. The proposed equipment layout plan is shown in Figure 3. The 6-foot fence is assumed to be chain link or other acoustically transparent design. An elevation plan of the compound is shown in Figure 4.

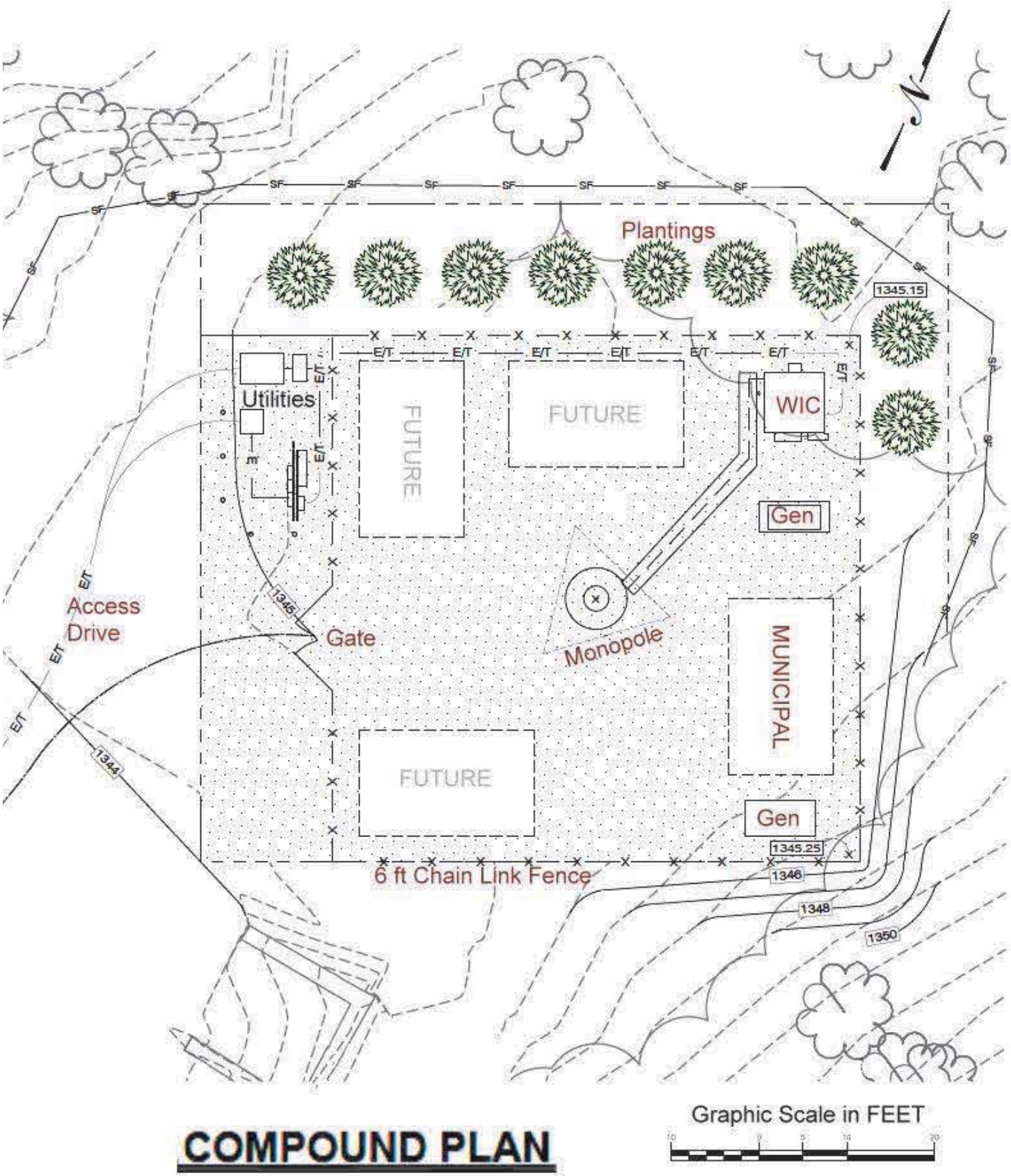


Figure 3: Plan Showing the Proposed Layout of the Equipment Compound

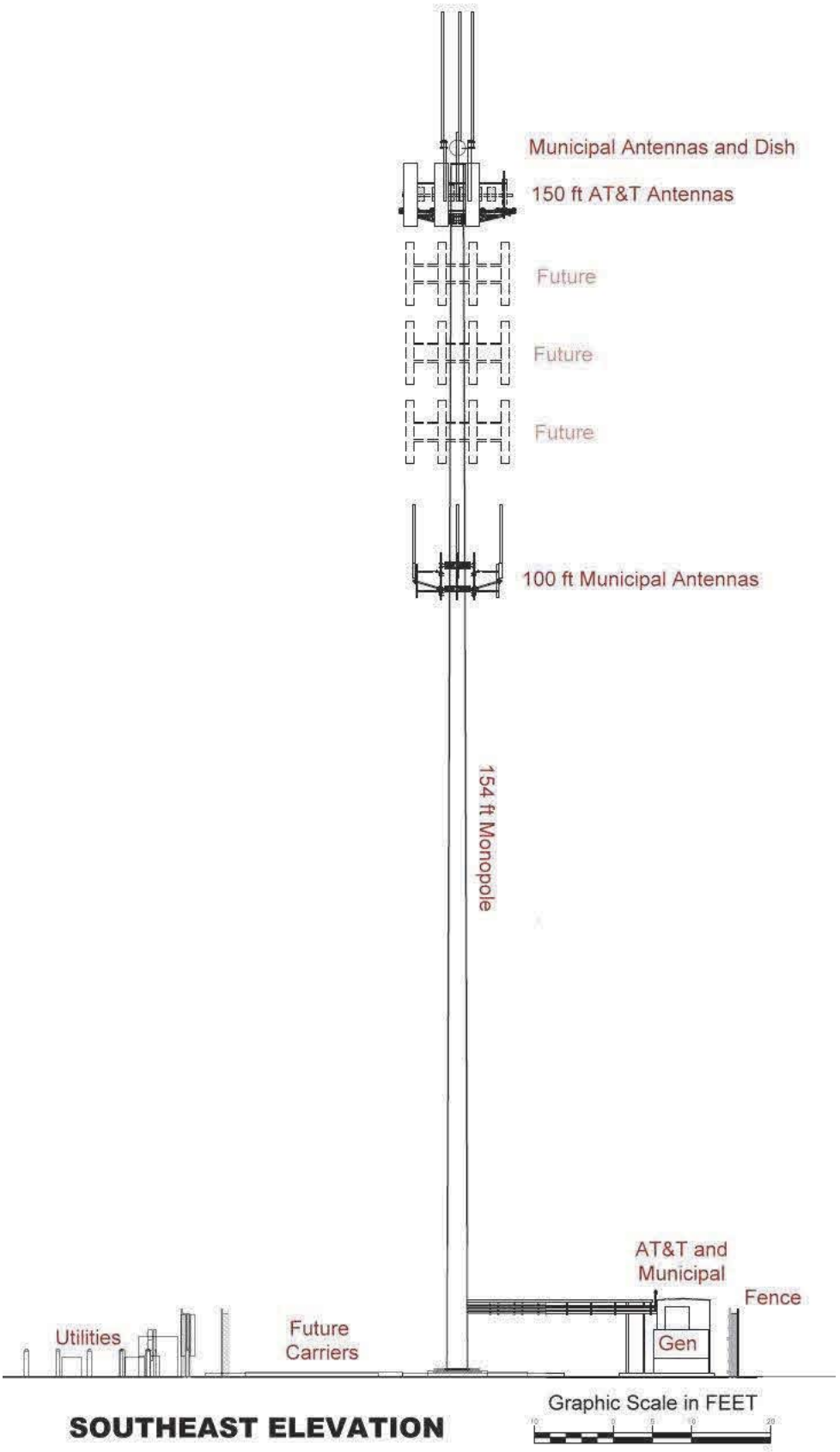


Figure 4: Plan Showing the Proposed Elevation Character of the Project

Results of Sound Level Modeling

The routine operation of the facility is not expected to include the cabinet cooler or generator, so emits only fan sounds when modest cooling is needed. To calculate the effect of the facility under the worst-case conditions, the sounds from the cabinet cooler plus generators are modeled together at receptor locations. The site location, receptors and their orientation to the proposed equipment were shown in Figure 1. The results of the worst-case modeling are shown in Table 4. Like air conditioning units in the surrounding community, the need for the supplemental cooler is expected to be limited to the warmest summer days under direct sunlight conditions. The cooler and generator test might never operate together as modeled in this worst-case scenario.

Table 4: Predicted Worst-Case Sound Levels Expected at Receptors

Receptor Location	Distance (ft) (from Source)	Ambient Level Day (dBA L_{eq})	Sound Level Standard (dBA)	Cooler+ Generator W/C Level
P/L, Southeast	50	46	55	50 dBA
P/L, North	90	46	55	48 dBA
Residence, Northwest	530	46	55	31 dBA
Residence, Northeast	510	46	55	32 dBA
Residence, West	1145	46	55	24 dBA

Note: It is customary to conduct all calculations using precise values, but to round the result to whole dBA. All results are rounded to units (dBA).

Sound Mitigation Assumptions

There are several notable mitigation measures in place to achieve the low sound levels shown above. The selection of the walk-in cabinet reduces the size and sound levels associated with full size shelters. The cabinet is oriented to emit sound in a direction that minimizes sound at the most exposed property line. The generators were selected from "quietest design" units that are available to support AT&T and Town of Kent electronics. The lower sound levels are a result of the genset full enclosures and low profiles. As a comparison, most mobile gasoline fired generators sized to support a residence would operate at 70 dBA or more at 23 feet. The routine tests of project generators are expected to emit about 55 dBA at the same distance.

Various generator configurations and mitigation options were evaluated as part of this study. Secondary enclosures or other external features for louder gensets could achieve the same level of compliance at regulated receptors. The planned equipment and configuration were specifically selected to meet the criteria using mitigation features designed into the chosen generator sets.

Conclusions

The potential sounds from the proposed installation were evaluated using measured field levels, vendor data and numerical modeling methods. Most of the time, the proposed wireless facility will produce no sound. The ambient sound level was established to be 46 dBA during the daytime. The only routine sound is from the cabinet ventilation which is expected to be about the ambient level at the nearest residential property lines.

A supplementary cabinet cooler is expected to operate only during the daytime under summertime highest ambient temperatures.

Infrequently, the proposed facility will include the sound from testing the emergency generator(s). This infrequent daytime testing was modeled to include the combined sound from cooler and both the AT&T and Town of Kent generators simultaneously. This represents a worst-case estimate, which could only happen during the few hottest days of the summer. The graphical modeling summary in Figure 5 shows the results at the applicable residential property lines. The Figure also shows the lower sound levels expected at the more distant existing residences on those same parcels.

The results of this expert analysis indicate the facility will comply with all federal and state requirements with respect to project sound at residential receptors.

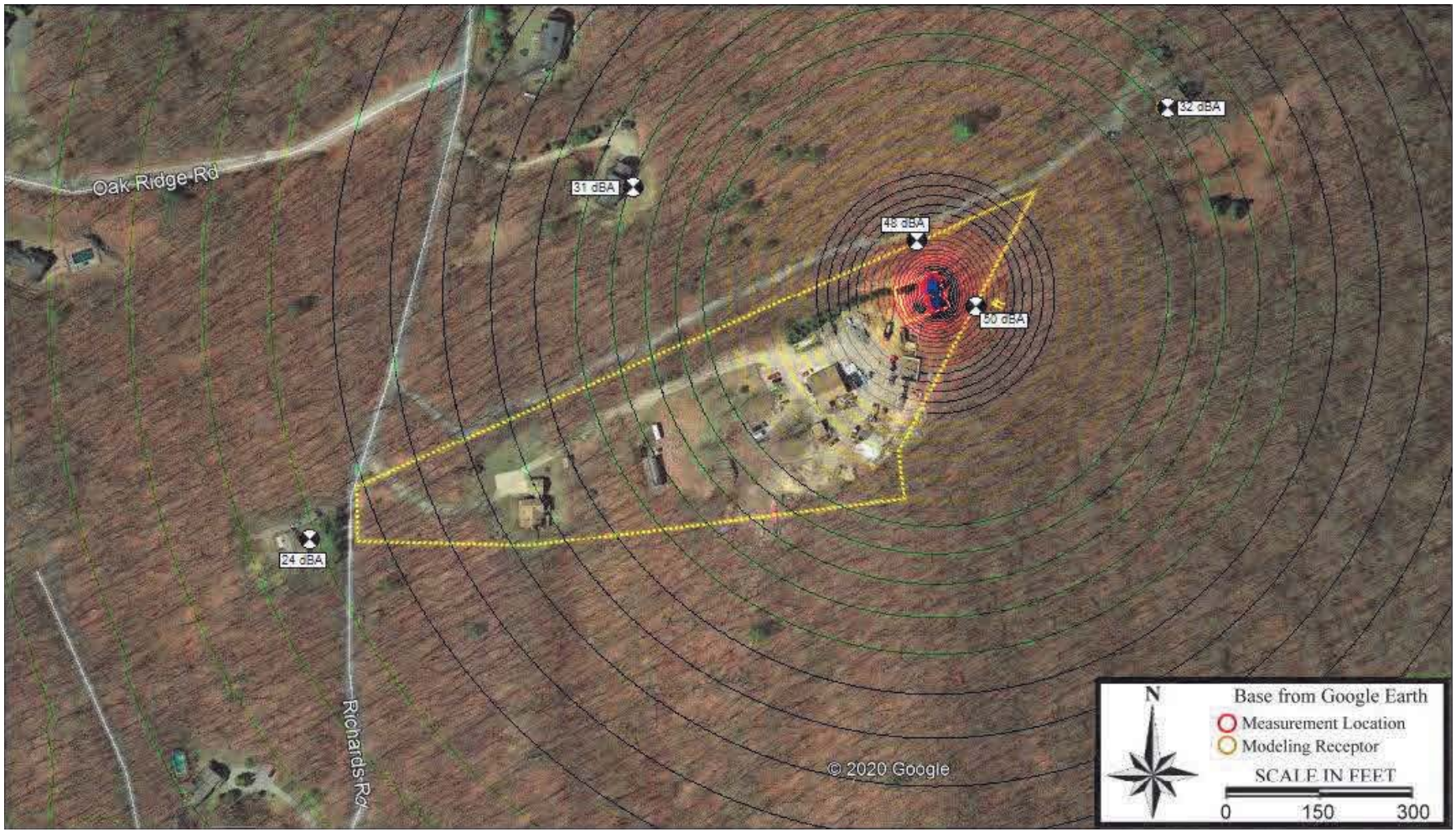
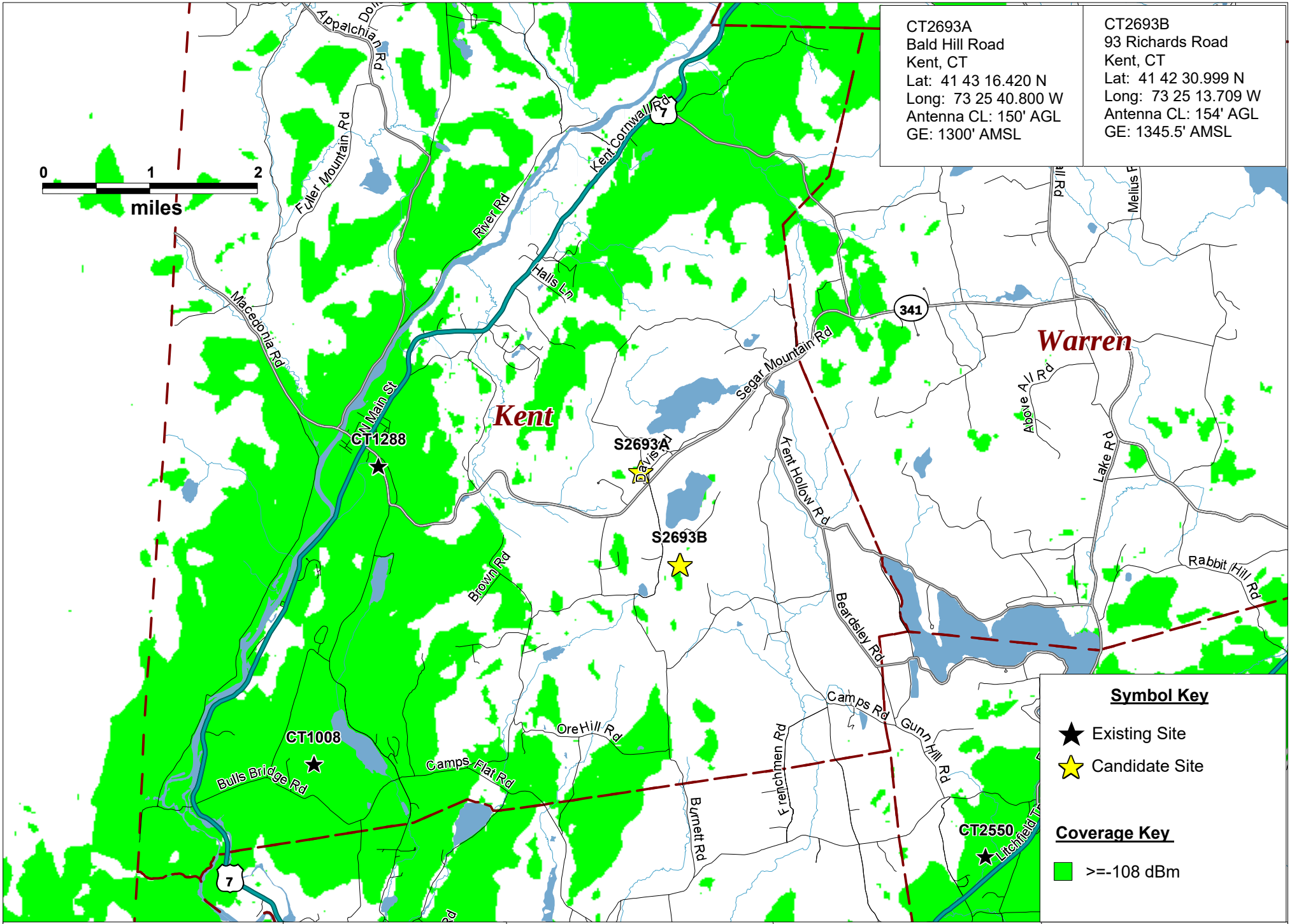


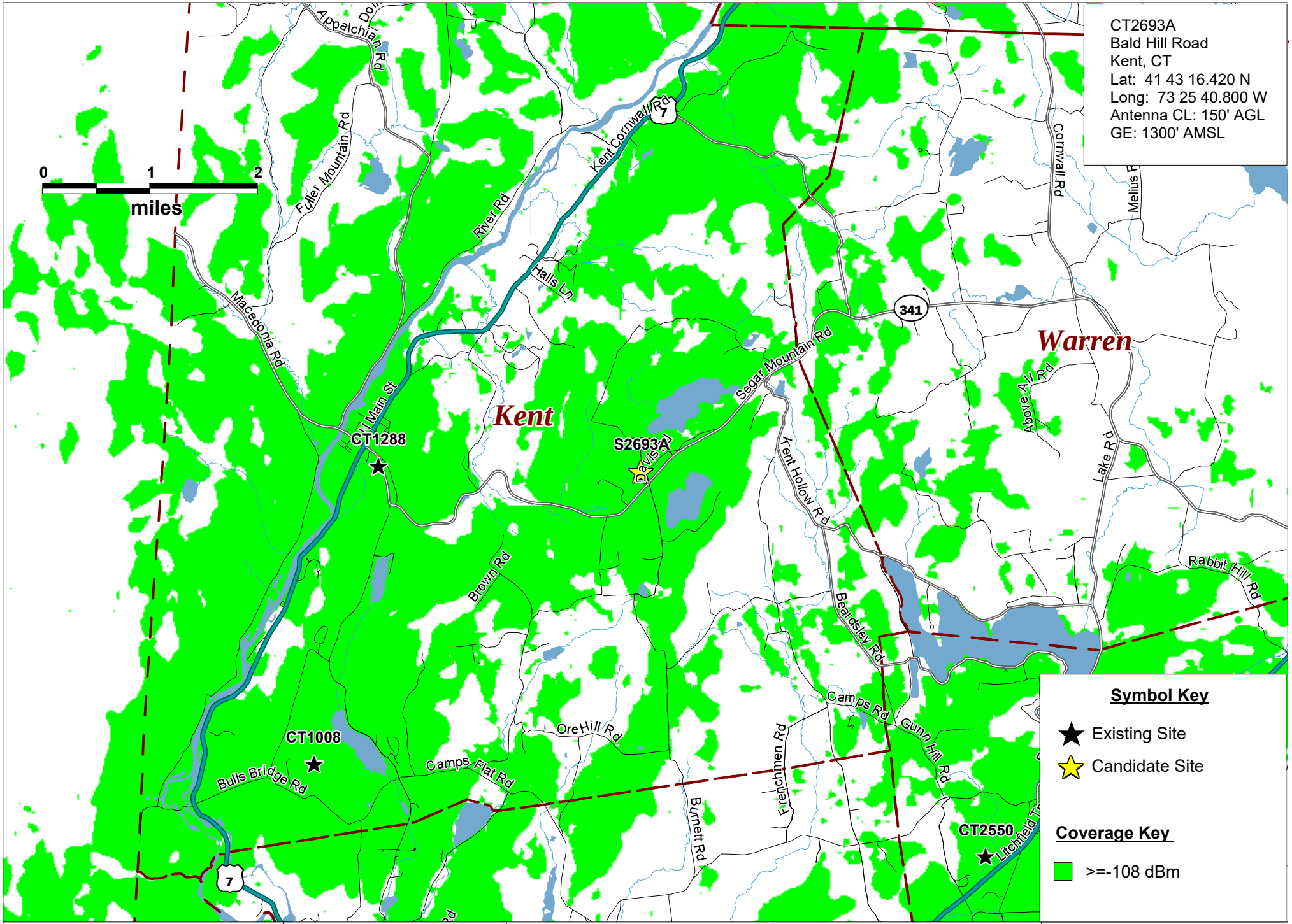
Figure 5: Graphical Summary of the Modeling Results Under Worst-Case Daytime Operating Conditions

ATTACHMENT 2

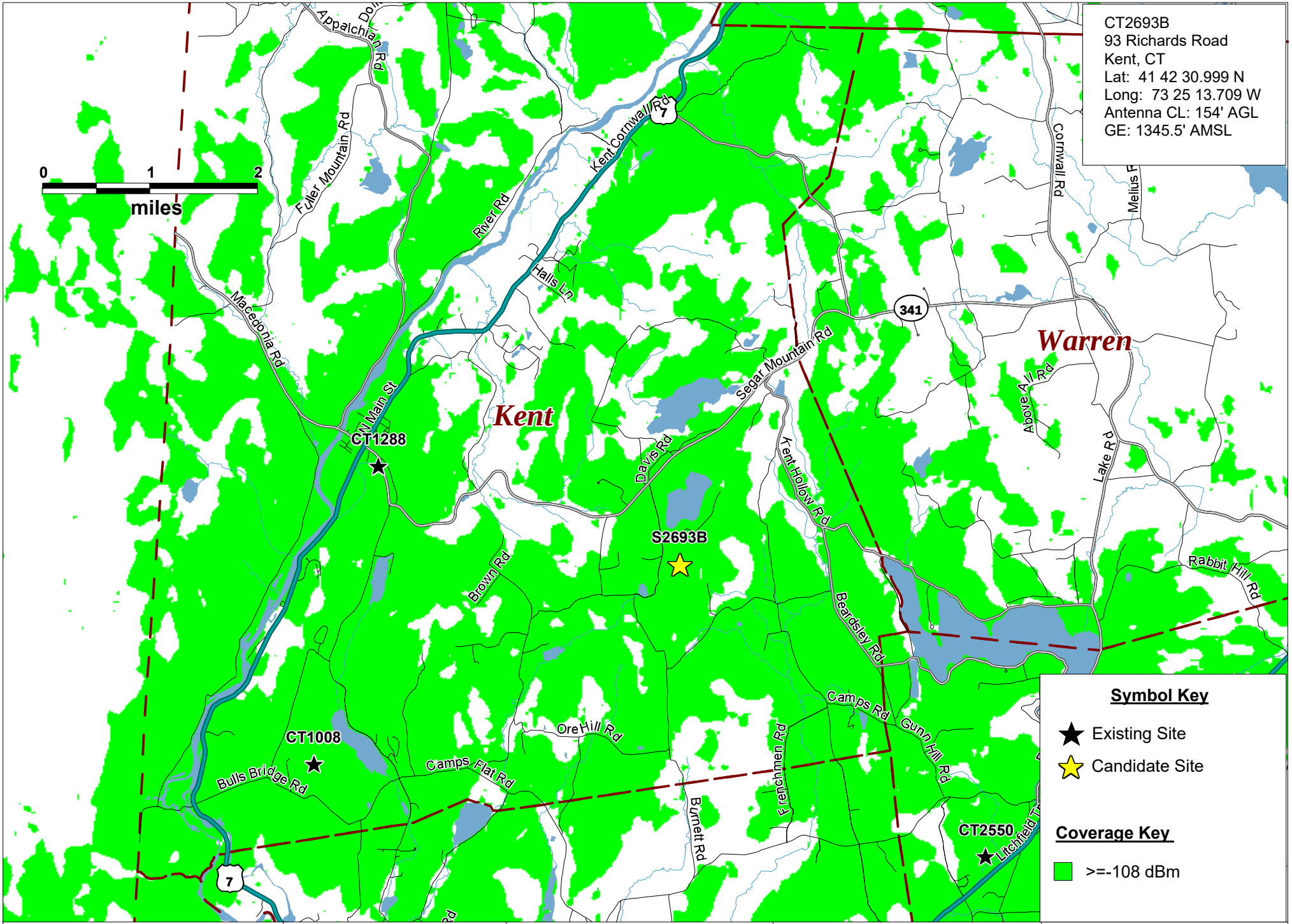


Existing Coverage 700 MHz LTE	Kent		at&t

PREPARED ON
DATE: 07/15/2020
REV 0



Existing & Proposed 700 MHz LTE Coverage	Kent	Bald Hill Road Kent, CT	at&t	PREPARED ON DATE: 07/15/2020 REV 0



Existing & Proposed 700 MHz LTE Coverage	Kent	93 Richards Road Kent, CT	at&t	PREPARED ON DATE: 07/15/2020 REV 0