NOISE

Chapter Fourteen

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A. INTRODUCTION

The findings and conclusions regarding the potential noise impact study performed for the subject property are summarized in this section. The study included an assessment of existing noise levels in accordance with the New York State Department of Environmental Conservation (NYSDEC) Program Policy on noise and both the Federal Highway Administration (FHWA)/New York State Department of Transportation (NYSDOT) noise criteria to determine if project generated traffic noise on affected access roads exceeded acceptable noise level criteria for adjacent residential land use. The updated project site plan was also evaluated regarding proposed operations and new equipment noise sources to address the potential effect of increased site activity on noise levels at the nearby residential properties based on the NYSDEC criteria.

B. EXISTING CONDITIONS

In assessing existing noise conditions in the study area, there are Federal and State noise criteria considered and generally accepted in addressing traffic noise impacts of a project on the affected community based on the land use categories. These criteria were established to protect the public health, safety and welfare by the FHWA from highway noise based on residential and other land use categories. The NYSDOT adheres to the FHWA criteria for assessing roadway impacts on land use, therefore, the FHWA noise criteria were used to evaluate this project. The NYSDEC criteria assesses the incremental change in noise level impacts for projects subject to the SEQRA review process.

FHWA/NYSDOT Criteria - The criteria used by the FHWA/NYSDOT in the evaluation of traffic noise impacts on residential properties is based upon Noise Abatement Criteria (NAC) for Land Use Categories described in federal regulations (23 CFR 772). This noise assessment considered the NAC set forth in Table 14-1 for residential land use. The maximum one-hour equivalent (Leq) noise level of 67 dBA for residential land use was the noise descriptor addressed in this assessment. The maximum hourly Leq noise levels were used to assess the potential noise impact of project generated traffic along Route 312 and other access roads for comparison with the FHWA land use criteria.

NYSDEC Requirements - The DEIS prepared under SEQRA regulations requires that the Lead Agency consider the potential for adverse environmental impacts. The NYSDEC has established a Program Policy entitled *Assessing and Mitigating Noise Impacts* (DEP-00-1, Feb. 2, 2001) applicable for projects under SEQRA review. The relevant noise impact criteria in the NYSDEC guidance document was also given consideration and addressed the

potential project impacts and the need for mitigation, in addition to review of the other noted noise regulations. The NYSDEC guidelines do not recommend any specific noise standards but describes how to evaluate the noise impact of a project based on the resultant change (increase) in existing ambient noise levels and guidelines defines the impact of those varying changes on human response, with a 1-3dBA change having no appreciable impact. The potential impact of the project on ambient noise is a SEQRA issue driven by the incremental change in noise levels, and the noise assessment documents the existing ambient noise levels as a basis for evaluating the project impact in accordance with the NYSDEC Program Policy. If the noise impact of the proposed is determined to be less than 3dBA, the project would not have a significant impact on adjacent receptors in accordance with the NYSDEC, and the need for considering mitigation would not be warranted.

Because of the complex manner in which the human ear functions, measurement of different noise sources does not always correspond to their relative loudness or annoyance. Therefore, different scales have been developed to provide guidance in evaluating the importance of different noise sources. The "A-weighted" scale (units expressed as dBA) has been widely accepted for noise impact analyses and has been found to compare well with human reaction to noise levels. Since noise levels fluctuate over a period of time, the hourly Leq or equivalent noise level was used to evaluate potential noise impacts. The Leq is the equivalent steady-state sound level which contains the same acoustic energy as the time-varying sound level during the same time period, and represents the noise descriptor addressed by the FHWA criteria and NYSDEC guidelines evaluated in this assessment.

Existing Leq noise levels were measured at two representative receptor locations in the study area shown in Figure 14-1 to determine the maximum hourly Leq noise levels affecting the existing residences along the local access roads and to address the FHWA/NYSDOT noise criteria. The A-weighted Leq or equivalent noise level was recorded at two representative locations along Route 312 both north and south of the site that would be most affected by the project-generated traffic. The existing residential receptors are strongly influenced by existing traffic along both Route 312 and I-84 near the project site. This information was used to determine the traffic related change in existing noise levels with the FHWA's hourly Leq criteria of 67 dBA (Table 14-1) applicable to residential land use. Receptor noise levels were measured during the midday traffic period between 2-4PM to determine representative noise levels affecting the residences along Route 312.

The noise measurements were conducted Tuesday, March 16, 2010 at the two residential receptors along Route 312 near the project site assumed to be representative of the surrounding community. Noise level measurements were taken for a 15-minute period during the above time period to determine Leq noise levels representative of ambient conditions in the study area. The dominant source of ambient noise during the measurements was the observed steady flow of traffic along Route 312 immediately adjacent to the residences. See Appendix P-Noise for equipment details and the meteorological conditions associated with the noise measurements.

The results of the ambient noise measurement study are presented in Table 14-2 for the Leq noise levels recorded at each receptor site. The FHWA/NYSDOT noise criteria of Leq= 67dBA for residential land use (Category B) was addressed in the study. The FHWA criteria are not directly applicable to or enforceable on the proposed project, but were used as a guide to evaluate acceptable noise levels for affected residential property near the project site. The maximum Leq noise levels measured at the two receptor sites ranged from 66.2-66.7dBA during the midday (off-peak) traffic period. Comparing these noise levels to the FHWA residential NAC of Leq= 67dBA, the existing residences located along the local access roads to the project site were found to be approaching the FHWA criteria for residential land use in the study area.

C. THE FUTURE WITHOUT THE PROPOSED PROJECT

The traffic report prepared for the project by FPCA (2009) was reviewed to determine if significant changes in future traffic volumes, vehicle types, or roadway travel speeds will occur that might affect traffic generated noise levels. Area traffic volumes must double over existing volumes to result in a 3dBA increase in the existing noise levels along the roadway corridor. Such an increase in traffic volumes does not occur for the project study area for future conditions without the proposed project, or 2011 No Build conditions. Therefore, the future magnitude of change in either the traffic volume, travel speed, or the distance from the noise source to the receptor were reviewed to determine potential noise levels for the No Build conditions.

The future 2011 No Build traffic will not double over the existing traffic volumes on the affected network roadways, and any proposed road improvements will not affect vehicle travel speeds. Therefore, the future No Build noise levels in the study area are expected to increase slightly but remain similar to exiting conditions shown in Table 14-2. The Weekday PM Peak hour traffic volumes were evaluated since they represented the highest volumes and the greatest potential noise impact on the affected residential receptors along Route 312. These conclusions were verified by modeling the potential effect of increased traffic volumes on future No Build noise levels at the residential receptors nearest to the project site using the TNM 2.5 Look-up Method. The TNM lookup method provides a worst-case noise level prediction at selected receptors using traffic data including traffic volumes, vehicle classifications and free-flow travel speeds on the affected roadway. Traffic volumes were provided in the project traffic report prepared by Frederick P. Clark Associates, Inc. (FPCA) dated December 2009. For this project, vehicle classifications along Route 312 were obtained from the same NYSDOT data by roadway type used for the intersection air quality modeling.

The Traffic Noise Model (TNM) Version 2.5 Look-up Method (2004) developed by the FHWA provides an update to the quick screening tool for evaluating simple highway geometries based on the TNM Version 2.5, a state-of-the-art computer program for highway traffic noise prediction and analysis. The original version of the TNM model released by the

U.S. Department of Transportation, Research and Special Programs Administration in 1999, and the Volpe National Transportation Systems Center Acoustics Facility (Volpe Center), in support of the FHWA, Office of Natural and Human Environment, developed the latest set of look-up tables for TNM Version 2.5 incorporating the first substantial improvements to the acoustics code in the original TNM model. The Volpe Center updated the original TNM Version 1.0 Look-Up Tables using the FHWA TNM Version 2.5 model to calculate sound levels for the revised look-up tables which are included in a Windows-compatible computer program used to facilitate easy access to the noise results in the tables. The TNM Look-up Tables Version 2.5 documentation was used to provide a reference of pre-calculated TNM results for simple highway geometries easily applied to this project for the noise assessment. Simple highway geometries entail sound levels propagated from an infinitely-long, straight roadway over flat ground to receivers at user-selected offset distances. All receivers are set at a height of 1.5 m above the ground. If desired, an infinitely long straight barrier may also be included. The model results are simplified but very conservative by assuming that all link traffic flows along the centerline of the roadway for estimating noise levels at the adjacent receptors.

The residential receptors evaluated were located along Route 312 to the north and south of the project site as shown in Figure 14-1. The Route 312 road segments were modeled to estimate the traffic noise levels affecting these receptors due solely to the effects of local traffic volumes assuming no future change over existing vehicle travel speeds or receptor distances along the existing road alignment.

The TNM results are presented in Table 14-3 and show that the 2011 No Build noise levels along Route 312 are slightly higher than the existing noise levels in Table 14-2 and slightly above the FHWA 67dBA criteria for residential land use. Based on the model results, the residential receptors will experience a maximum No Build Leq=68.0 dBA at Site 1 and a Leq=70.4 dBA at Site 2 versus Existing Leq noise levels of Leq=66.7 dBA at Site 1 and a Leq=66.2 dBA at Site 2.

D. POTENTIAL IMPACTS OF THE PROPOSED PROJECT

As previously stated, the traffic report prepared for the project by FPCA (2009) was reviewed to determine if significant changes in project traffic volumes, vehicle types, or roadway travel speeds will occur that might affect traffic generated No Build noise levels. Area traffic volumes must double over existing volumes to result in a 3dBA increase in noise levels along the roadway corridor. Such an increase in traffic does not occur for the proposed project which primarily distributes site generated traffic over a more efficient road network by improving signal timing and increasing turn lanes at critical intersections along the existing travel routes. The project related magnitude of change in either the traffic volume, travel speed, or the distance from the noise source to the receptor were also reviewed and analyzed to determine potential project noise impacts.

The 2011 project Build traffic will not double over the future 2011 No Build traffic volumes on the affected network roadways, and the proposed road improvements will not affect vehicle travel speeds. The noise impact assessment considered the worst-case traffic conditions affecting the study roadways during the Weekday and the Saturday peak hour periods, and determined that the Weekday PM Peak hour traffic volumes were the highest and represented the greatest potential noise impact on the affected residential receptors along Route 312. The traffic report indicated that the total PM peak hour volumes will increase on Route 312 between 2011 No Build and Build conditions by a maximum of 20 percent at Zimmer Road and by 13 percent at Prospect Road, resulting in less than 1dBA increase in noise levels at the nearby residential receptors. Therefore, the project-generated traffic will result in no significant change in the future noise levels at affected receptors along Route 312. These conclusions were verified by modeling the potential effect of increased traffic volumes on noise levels at the residential receptors nearest to the project site using the TNM 2.5 Look-up Method.

The residential receptors evaluated using the TNM 2.5 Look-up Method were located along Route 312 to the north and south of the project site. No road improvements are proposed along Route 312 that would move traffic closer to the residential receptors evaluated in the vicinity of Zimmer Road (Site 1) and Prospect Road (Site 2). The Route 312 road segments were modeled to estimate the change in noise levels at these receptors due solely to the effects of change in traffic volumes since the project will not affect vehicle travel speeds or receptor distances along the existing road alignment.

The TNM lookup method provides a worst-case noise level prediction at selected receptors based on project traffic data including traffic volumes, vehicle classifications and free-flow travel speeds on the affected roadway. The TNM results presented in Table 14-3 show that both the 2011 No Build and Build noise levels along Route 312 are above the FHWA 67dBA criteria for residential land use. However, the greatest change in Leq noise levels due to project traffic will be less than 1dBA at both receptor sites where the residential receptors will experience a maximum Build Leq=68.8 dBA at Site 1 and a Leq=70.9 dBA at Site 2 versus No Build Leq noise levels of Leq=68.0 dBA at Site 1 and a Leq=70.4 dBA at Site 2. Therefore, the project related increase of less than 1dBA at receptors over No Build noise levels is an imperceptible change (Table 14-4) that will have minimal impact on the affected residences.

Facility Operation Noise Impacts

Site related noise sources associated with the completion of the project were evaluated including the rooftop heating and ventilation equipment and truck loading dock activities located adjacent to the proposed buildings. The total noise level emitted by the proposed equipment was addressed by using manufacturer's noise data or empirical noise measurement data for similar equipment in operation. The effect of these noise sources was conservatively treated as a continuous point source to determine the combined effects of

their operation on ambient noise levels. The nearest property line and residential receptor was addressed for the potential onsite equipment sources. The proposed HVAC units located on the building rooftops and the at-grade chiller locations onsite would not result in any major offsite noise impact. The potential noise associated with the HVAC units is screened from the site property line and near residences by the buildings or site topography and will have little or no effect on existing ambient noise levels.

The HVAC equipment on the rooftop of the proposed buildings was assumed to be units manufactured by Johnson Control and the at-grade chillers manufactured by York with sound power levels rated at 100 percent loading provided by the manufacturer. Noise levels associated with additional site sources due to the loading dock activities included truck maneuvering, truck idling, truck unloading, and the compactor were obtained from empirical data used for evaluating loading dock operations. Details are provided in the Appendix K-Noise. The HVAC equipment associated with the proposed hotel is expected to be located indoors with rooftop exhausts that would not be considered a potential source of noise impact at the distant to the nearest residential receptor to the north of the project site. The project related noise levels due to the proposed building layout were predicted at the north property line and adjacent residence using the current site plan configuration and standard formula for estimating sound propagation and combining noise levels. The potential noise impacts were determined using the equipment noise data adjusted for distance from the source to determine the total noise level at the near property line and residence using the standard sound propagation relationship,

$$\text{Sound pressure level reduction (dB)} = 20 \log_{10} (Dm/De)$$

where Dm = distance from the source to measurement location,
and De = distance from the source to the receptor point.

Equipment noise sources onsite will not affect ambient noise levels that are dominated by existing traffic sources in the study area. The results in Table 14-5 show the total receptor noise levels associated with the combined effects of all rooftop equipment and truck loading dock activities operating simultaneously. The equipment noise level analysis resulted in a maximum noise level of 42dBA at both the northeast property line (Site 1) and the adjacent residence due primarily to the maneuvering of trucks near the loading docks. The site generated noise level is an estimated 24dBA lower than the existing ambient noise levels ranging from 66-67dBA near Route 312 shown in Table 14-2. These results indicate that the site-generated equipment noise will have little or no effect on either the existing noise levels or the predicted future No Build Leq noise levels at the near residential receptors shown in Table 14-3. Therefore, the noise from all equipment sources will have a negligible impact on existing noise levels at Site 1, the nearest residence north of the project site, resulting in no appreciable effect as stated in the NYSDEC Program Policy for assessing noise impacts. The results in Table 14-5 indicate that mitigation measures are not required for this project in accordance with the standard noise impact criteria noted in the NYSDEC

guidelines.

Construction Noise Impacts

Construction Operations. The potential noise impact generated during the construction activities at the project site would depend on the phase of construction (site preparation, excavation, foundation, and finishing), the type and amount of construction equipment, and the percentage of time the equipment operates over the work day. Excavation would be the noisiest phase of construction, typically lasting from two to three months at various locations throughout the project site; noise levels would then decrease as other construction activities proceed over the typical construction period estimated at 24 months.

The range of noise levels to be expected for different construction equipment at a distance of 50 feet is provided in Table 14-6. As a general rule, sound levels will drop approximately 6 dBA with each doubling of distance from the source. For example, the noise level that could be expected at 50 feet from a bulldozer would be 87 dBA and at 100 feet would be approximately 81 dBA. If the bulldozer was equipped with an exhaust muffler, the potential noise level would be 5 dBA lower, or 76 dBA at 100 feet. The noisiest equipment likely to be employed during the excavation phase is earth moving equipment such as backhoes, tractors, and heavy-duty diesel trucks. Noise levels would tend to decrease as the other construction activities proceeded during the different phases.

Table 14-7 provides hourly Leq noise levels for typical construction phases of non-residential building construction taking into consideration the type, amount, and percentage of time of the equipment operating. The noise levels in Table 14-7 indicate that receptors adjacent to the project site would experience a temporary increase in noise levels due to construction activities. However, construction noise impacts will be short term and the project would not have any long term significant impact on existing community noise levels in the study area.

Noise levels due to construction activities could be reduced by approximately 5 dB (see Table 14-6) through periodic maintenance and the use of equipment with properly installed and maintained mufflers. Noise emissions from other stationary construction equipment, such as pumps and compressors, could be mitigated through the use of shields or other physical enclosures around the noise producing part of the machinery.

The degree of noise control selected during construction would depend upon the amount of attenuation desired. In the case of this project, where the nearest residential property is adjacent to Route 312 traffic sources and well over 1000 feet from the center of construction activity, potential construction related noise impacts are not expected to be significant and typical mitigation measures to shield construction equipment noise effects would not be required.

Temporary vehicle-related noise impacts would result from construction vehicles and equipment utilizing the local street network to access the proposed site and construction areas. One noise mitigation measure already in place is the local restriction of construction operations to the daytime hours. Other measures would require all construction equipment to have properly installed and maintained mufflers, and only use designated access routes to avoid the more sensitive residential areas.

Construction Traffic. Traffic generated by construction activities would be minimal and is not expected to have a significant effect on local noise levels. Site-related construction will not require the shutdown of local streets or the diversion of traffic onto local streets for extended periods of time. There are standard relationships between traffic volumes and noise levels used to address the potential noise impacts along the local access roads. Examples of the magnitude of change in either the traffic volume, vehicle classification, travel speed, or the distance from the noise source to the receptor, that are necessary to result in a 3 dBA increase in noise levels are as follows:

- a doubling of the hourly auto or truck volumes,
- a doubling of the combined hourly auto and truck volumes,
- a one-third reduction in the distance between the vehicular traffic and the sensitive receptor,
- an increase in average speed by 15 mph or more.

The proposed project traffic will not significantly affect the existing traffic volumes along any critical site access roads during construction operations. Noise levels will generally increase as the traffic volumes increase on a roadway, but volumes must double over existing conditions before a significant change in noise will occur which is not anticipated for this project. Vehicle classification (defined as the mix of automobiles and trucks) will influence noise levels based on the noise emission characteristics of these vehicles. Noise emissions from trucks are relatively higher than automobiles for all average travel speeds.

It was assumed that average vehicle speeds on access roads in the study area would not be affected by construction-generated traffic due to the local nature of the affected roadways and existing speed limits between 35-45 miles per hour. Also, the vehicle mix of site generated traffic was assumed to be similar to existing conditions which include automobiles and delivery trucks. Therefore, the travel speed and vehicle classification parameters would not affect any change in existing noise levels, and the only remaining factor affecting community noise levels would be the increase in traffic volumes on local streets due to the construction activities.

As stated previously, the additional traffic due to construction vehicles is not expected to double the existing traffic volumes, therefore, a change in existing hourly Leq noise levels of less than 1-3dBA is expected to occur along the site access routes affected by the project. To assess the potential impact of such an increase in noise levels, the subjective reaction or

community response to the magnitude of noise level change is listed in Table 14-4. A change in existing noise levels of 3 dB is considered to be a barely perceptible change. The project construction traffic would result in a maximum daytime increase of less than 1-3dBA over existing traffic noise levels, or an imperceptible to barely perceptible change. The project is not expected to result in a significant traffic noise impact at affected receptors along local access roads due to construction operations. Any effect of construction traffic would be short term and limited to daytime hours minimizing the potential noise impact on both nearby residential and commercial receptors with a return to existing conditions after the project is completed.

E. MITIGATION MEASURES PROPOSED

Based on the project generated increase in traffic volumes on local roadways and the results of the noise impact assessment, no special mitigation measures are being recommended or required for the proposed project. Typical mitigation measures to reduce construction related noise impacts are not required due to the remote receptors to the project site (see Section 14.D discussion). The proposed project will result in an imperceptible (less than 1dBA) increase over future No Build noise levels due to site generated traffic, in no offsite noise impacts due to the proposed onsite HVAC equipment, and in less than a 3dBA (imperceptible) short term increase in receptor noise levels due to daytime construction activity, all in compliance with both the FHWA/NYSDOT criteria and the NYSDEC Program Policy for assessing project noise impacts under SEQRA review requirements.

IMPACTS ON AIR/NOISE DUE TO 2013 PROJECT SCOPE REDUCTION

The DEIS was updated in 2013 to reflect the downsizing of the project scope and the resultant effect on potential environmental impacts with an estimated completion year of 2015. The DEIS traffic study was updated by Frederick P. Clark and Associates, Inc. (FPCA) to address site generated traffic impacts for the analysis year 2015 accounting for updated traffic counts in 2012, significant reduction in the project size, and resultant changes in the projected 2015 No Build and Build traffic volumes. The potential traffic related air quality and noise impacts of the proposed project as summarized in the DEIS were previously evaluated for the analysis year 2011. The results of the FPCA 2015 traffic analysis were reviewed with respect to the impact of the change in traffic volumes on the results and conclusions of both the technical air quality and noise studies. The results of this qualitative assessment are as follows:

With respect to the air quality analysis, the effect of the 2015 traffic volumes on both intersection capacity and the corresponding levels-of-service (LOS) were reviewed to determine any change in the prior study results and conclusions. Since traffic volumes have a direct effect on CO levels, any incremental change in volumes would have a proportional increase or decrease in projected CO levels. The updated LOS analysis indicates the critical intersection remains at Route 312 with the I-84 WB Ramps and the proposed Site Entrance. The updated traffic study indicated that the 2015 No Build volumes will increase slightly over the 2011 No Build volumes during the weekday PM peak hour at the critical intersection analyzed based on the recent traffic count data. In addition, the 2015 Build volumes decrease by 50 vehicles compared to the 2011 Build conditions analyzed (see Table A-1 attached) due to trip diversions to the northern Site Entrance. The updated traffic study indicates that the 2015 Build traffic volumes decrease and the LOS will remain at LOS C at the critical intersection compared to the 2011 conditions analyzed, resulting in CO levels less than the 2011 Build CO levels in the DEIS. In addition, vehicle related CO emissions will decrease in future years so the 2011 vehicle emission estimates would be slightly conservative estimates for the 2015 Build CO levels. Therefore, the updated 2013 traffic study will not alter the DEIS findings and conclusions regarding the insignificant impact of the project on air quality previously determined for the 2011 Build conditions.

With respect to the noise assessment, the downsized project will reduce the number of rooftop HVAC units required based on the square footage reduction making the equipment noise study for the 2011 project conservative for representing the 2015 project conditions. The 2011 noise assessment summarized in the DEIS did not indicate any equipment related noise impacts at the adjacent receptors.

The traffic noise impact was addressed at two residences along Route 312 in the vicinity of the intersections with both Zimmer Road and Prospect Road. As shown in Table A-1, the 2011 No Build traffic volumes increase slightly along Route 312 at both intersections for the 2015 analysis year based on the updated No Build projections. The proposed 2015 Build traffic volumes along Route 312 actually decrease from the 2011 Build volumes near both the Prospect Road and Zimmer Road intersections based on the reduction in project size. The results of the 2011 traffic noise analysis summarized in the DEIS indicated the incremental project impact of less than 1 dBA at both receptors analyzed due to projected volume increases. The reduction in traffic volumes that occur near Zimmer Road and Prospect Road under 2015 Build conditions would not affect the magnitude of the projected change in noise levels for 2011 Build conditions. Therefore, the updated 2015 Build traffic study will not alter the findings or conclusions regarding the project's insignificant impact on community noise levels determined for the 2011 Build conditions.

Based on the review of the new reduced project scope, the 2015 traffic study, and the qualitative assessment regarding the air quality and noise levels presented in the DEIS for 2011 conditions, it was determined that the proposed site-generated traffic for the year 2015 project conditions would not alter the findings of the DEIS regarding 2011 Build conditions. Therefore, a revised analysis of 2011 conditions was not required to address the reduced project traffic impacts and resultant effect on both air quality and noise levels due to the future 2015 Build conditions.

Table A-1
2009/2013 TRAFFIC STUDIES – INTERSECTION TRAFFIC VOLUMES COMPARISON – PEAK HOURS
Crossroads 312
Route 312
Southeast, New York

INTERSECTIONS	DIFFERENCES IN TRAFFIC VOLUMES														
	Weekday Morning					Weekday Afternoon					Saturday Midday				
	2009/2012 Existing	2011/2015 No-Build	2011/2015 Build	Net Change Existing/ No-Build	Net Change No-Build/ Build	2009/2012 Existing	2011/2015 No-Build	2011/2015 Build	Net Change Existing/ No-Build	Net Change No-Build/ Build	2009/2012 Existing	2011/2015 No-Build	2011/2015 Build	Net Change Existing/ No-Build	Net Change No-Build/ Build
U.S. Route 6 at Route 312/Access Road	-191	-184	-189	7	-5	-252	-246	-281	6	-35	-56	-52	-99	4	-47
Route 312 at I-84 Eastbound Interchange 19 On/Off Ramps/Independent Way	173	188	182	15	-6	93	109	59	16	-50	5	16	-57	11	-73
Route 312 at I-84 Westbound Interchange 19 On/Off Ramps/Site Access Drive	45	52	33	7	-19	99	109	-31	10	-140	139	150	79	11	-71
Route 312 at International Boulevard/ Site Access Drive	59	66	N/A	7	N/A	105	126	N/A	21	N/A	34	39	N/A	5	N/A
Route 312 at Zimmer Road	55	59	57	4	-2	102	109	79	7	-30	38	44	20	6	-24
Route 312 at North Brewster Road	27	37	37	10	0	33	46	15	13	-31	28	45	21	17	-24
Route 312 at Farm to Market Road/Brewster Hill Road	34	50	52	16	2	38	60	25	22	-35	8	40	18	32	-22
Route 22 at Route 312/Towne Centre Access Drive	58	269	268	211	-1	71	273	254	202	-19	54	177	159	123	-18

Note: N/A = Comparison is invalid because in the 2013 traffic study the northerly access drive will be included at this intersection.

File: Q:\747.000 Rt. 312 Commercial, Southeast\Arial Photos\Fig1.mxd

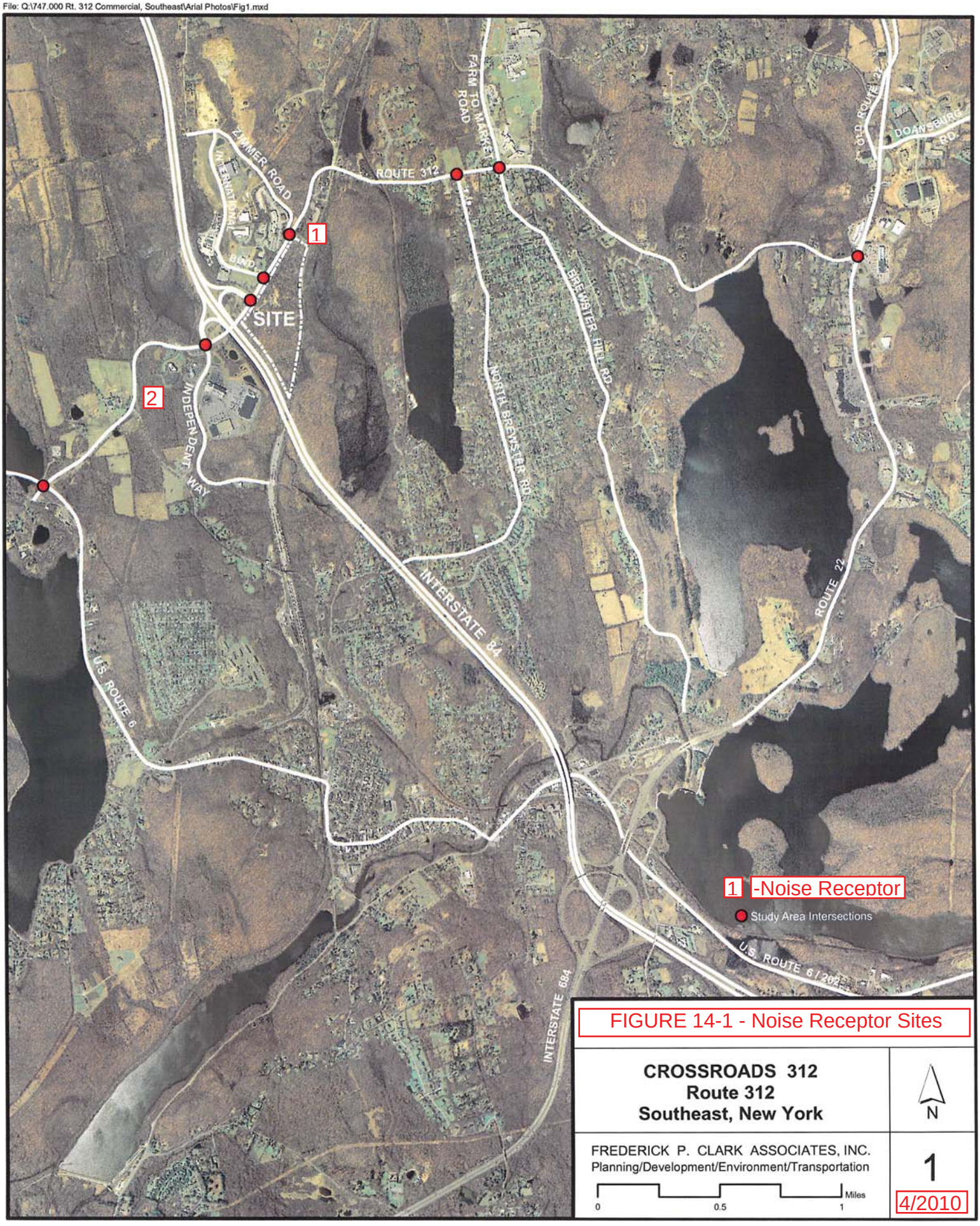

FIGURE 14-1 - Noise Receptor Sites

CROSSROADS 312
Route 312
Southeast, New York

N

FREDERICK P. CLARK ASSOCIATES, INC.
Planning/Development/Environment/Transportation

0 0.5 1 Miles

1

4/2010

TABLE 14-1

THRESHOLD FOR NOISE INTERFERENCE AND NOISE ABATEMENT CRITERIA (dBA)

Activity Category	Interference* Leq	Criteria Leq	Description of Activity Category
A (Exterior)	45	57	Tracts of land where serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose. Such areas could include amphitheaters, particular parks or portions of parks, open spaces, or historic districts which are dedicated or recognized by appropriate local officials for activities requiring special qualities of serenity and quiet.
B (Exterior)	55	67	Picnic areas, recreation areas, playgrounds, active sports areas, and parks which are not included in Category A and residences, motels, hotels, public meeting rooms, schools, churches, libraries, and hospitals.
C (Exterior)	60	72	Developed lands, properties, or activities not included in Categories A and B above.
D	--	--	For requirements on undeveloped lands, see paragraphs 11a and c of Federal Air Highway Program Manual, Volume 9, Chapter 7, Section 3.
E (Interior)	40	52	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

* Source: FHWA Report "A Field Review of the Highway Traffic Noise Impact Identification and Mitigation Decisionmaking Processes." (Appendix B, Table 5)

TABLE 14-2
MEASURED EXISTING NOISE LEVELS

Receptor Location	Peak Hour Leq (dBA)*
Site 1: Residence-Route 312 NB at Zimmer Road	66.7
Site 2: Residence-Route 312 NB near Prospect Road	66.2

***** Measured Midday PM Leq levels assumed representative of PM peak hour Leq noise levels at receptors.

TABLE 14-3
2011 NO BUILD AND BUILD NOISE LEVELS

Receptor Location	Peak Hour Leq (dBA)*	
	No Build	Build
Site 1: Residence-Route 312 NB at Zimmer Road	68.0	68.8
Site 2: Residence-Route 312 NB near Prospect Road	70.4	70.9

***** Noise levels based on No Build/Build weekday PM peak hour traffic on Rt.312 using the TNM Look-up Screening method.

TABLE 14-4

SUBJECTIVE REACTION TO A CHANGE IN NOISE LEVELS

Change in Level	Subjective Reaction
1 dB	Imperceptible to human response
3 dB	Barely perceptible to most people
5 dB	Noticeable change
10 dB	Doubling or halving in loudness
20 dB	A dramatic change

Source: Federal Highway Administration, Fundamentals and Abatement of Highway Traffic Noise, Bolt Beranek and Newman, Inc., June, 1973.

TABLE 14-5

RESULTS OF SITE-GENERATED NOISE SOURCE ANALYSIS

HVAC EQUIPMENT NOISE AT PROPERTY LINE AND NEAREST RESIDENCE

Site Equipment		Sound Power Level	SPL at "x" ft.	Distance "x" ft.	Distance to PL	Noise Reduction	Noise at Site NE PL	Noise at PL w/Screening (dBA)	Distance to Res.	Noise at RES w/Screening (dBA)
			Equipment Noise Levels-(dBA)							
NORTHEAST Property Line										
ROOFTOP HVAC										
Johnson Control-25 Tons										
	Rooftop Unit									
	JC-Unit 1	100	90	3	1730	-55	35	25	1750	25
	JC-Unit 2	100	90	3	1680	-55	35	25	1700	25
	JC-Unit 3	100	90	3	1755	-55	35	25	1775	24
	JC-Unit 4	100	90	3	1705	-55	35	25	1725	25
	JC-Unit 5	100	90	3	1580	-54	35	25	1600	25
	JC-Unit 6	100	90	3	1530	-54	36	26	1550	26
	JC-Unit 7	100	90	3	1530	-54	36	26	1550	26
	JC-Unit 8	100	90	3	1480	-54	36	26	1500	26
	JC-Unit 9	100	90	3	1455	-54	36	26	1475	26
	JC-Unit 10	100	90	3	1405	-53	36	26	1425	26
	JC-Unit 11	100	90	3	1380	-53	37	27	1400	26
	JC-Unit 12	100	90	3	1330	-53	37	27	1350	27
	JC-Unit 13	100	90	3	1330	-53	37	27	1350	27
	JC-Unit 14	100	90	3	1280	-53	37	27	1300	27
	JC-Unit 15	100	90	3	1230	-52	38	28	1250	27
	JC-Unit 16	100	90	3	1180	-52	38	28	1200	28
AT-GRADE CHILLERS										
York Chiller Units										
	Unit 1	98	88	3	1705	-55	33	23	1725	23
	Unit 2	98	88	3	1680	-55	33	23	1700	23
LOADING DOCK SOURCES										
Truck- Maneuvering		-	69	40	1580	-32	37	37	1600	37
Truck- Idling		-	67	40	1580	-32	35	35	1600	35
Truck- Unloading		-	71	12	1530	-42	29	19	1550	19
	Compactor	-	73	5	1530	-50	23	13	1550	13
						TOTAL NOISE		**42**		**42**

NOTES: Assumed minimum 10dB reduction for the buildings screening both the rooftop units and the at-grade chiller equipment from the Northeast PL and nearest residence north of the project site. The Hotel proposed on the remote south portion of the project site was assumed to have an interior mechanical room and rooftop vents that typically will have no noise impact on adjacent properties.

TABLE 14-6

TYPICAL CONSTRUCTION EQUIPMENT NOISE LEVELS

Equipment Type	Average Noise Level at 50 feet (Leq, dBA) Without Controls	With Controls
Earthmoving		
Front Loader	84	80
Back Hoe	85	75
Dozer	87	82
Tractor	80	75
Scraper	88	80
Grader	85	75
Truck	88	75
Paver	89	80
Materials Handling		
Concrete Mixer	85	75
Concrete Pump	82	75
Crane	88	80
Derrick	88	75
Stationary		
Pump	76	75
Generator	78	75
Compressor	81	75
Impact		
Pile Driver	101	95
Jack Hammer	88	75
Rock Drill	98	80
Pneumatic Toll	86	80
Other		
Saw	78	75
Vibrator	76	75
Vibratory Roller	80	75

Source:Regulation of Construction Activity Noise, Bolt Beranek and Newman, Inc. Report 2887, W.N. Patterson, R.A. Ely, and S.M. Swanson, prepared for the USEPA-Washington, D.C., November 1974.

TABLE 14-7

TYPICAL SOUND LEVELS AT CONSTRUCTION SITES (Leq at 50 feet, dBA)

	Office Building Hotel Hospital School Public Works		Industrial Parking Garage Service Station	
Activity	I	II	I	II
Ground Clearing	84	84	84	83
Excavation	89	79	89	71
Foundations	78	78	77	77
Erection	87	75	84	72
Finishing	89	75	89	74

I. All pertinent equipment present at site.
II. Minimum required equipment at site.

Source:Alfredson, Robin J., and May, D.N., "Construction Equipment Noise" in May, Daryl N., Handbook of Noise Assessment, 1978.