APPENDIX Q NOISE EVALUATION

INTRODUCTION

Noise is typically defined as unwanted or undesirable sound. The basic parameters of environmental noise that affect human subjective response are (1) intensity or level, (2) frequency content and (3) variation with time. Intensity of sound is expressed using a logarithmic scale in units of decibels (dB). By using this scale, the range of normally encountered sound can be expressed by values between 0 and 120 decibels. On a relative basis, a 3-dB change in sound level generally represents a barely noticeable change, whereas a 10-dB change in sound level would typically be perceived as a doubling (or halving) the loudness of a sound.

The frequency content of noise is related to the tone or pitch of the sound and is expressed based on the rate of the air pressure fluctuation in terms of cycles per second (called Hertz and abbreviated as Hz). The human ear can detect a wide range of frequencies, from about 20 Hz to 17,000 Hz. However, because the sensitivity of human hearing varies with frequency, the “A-weighting system” is commonly used when measuring environmental noise to provide a single number descriptor that correlates with human subjective response. Sound levels measured using this weighting system are called "A-weighted" sound levels and expressed in decibel notation as dBA. Throughout this section, all sound levels are expressed with dBA weighting. **Table Q-1** presents examples of A-weighted sound pressure levels.

Table Q-1: Examples of Common Sounds: A-weighted Sound Level in Decibels (dBA)

A-Weighted Noise Level	Overall Level	Noise Environment
120	Uncomfortably loud (32 times as loud as 70 dBA)	Military jet airplane takeoff at 50 feet.
100	Very loud (8 times as loud as 70 dBA)	Jet flyover at 1,000 feet. Locomotive pass-by at 100 feet.
80	Loud (2 times as loud as 70 dBA)	Propeller plane flyover at 1,000 feet. Diesel truck 40 miles per hour at 50 feet.
70	Moderately loud	Freeway at 50 feet from pavement edge at 10 a.m. Vacuum cleaner (indoor).
60	Relatively quiet (1/2 as loud as 70 dBA)	Air condition unit at 100 feet. Dish washer at 10 feet (indoor).
50	Quiet (1/4 as loud as 70 dBA)	Large transformers. Small private office (indoor).
40	Very quiet (1/8 as loud as 70 dBA)	Birds calls. Lowest limit of urban ambient sound.
10	Extremely quiet	Just audible. (1/64 as loud as 70 dBA)
0		Threshold of hearing.

Source: Federal Interagency Committee on Noise 1992

Because environmental noise fluctuates from moment to moment, it is common practice to condense all this information into a single number, called the "equivalent" sound level (Leq). Leq can be thought of as the steady sound level (or average sound level) that represents the same sound energy as the varying sound levels over a specified time period. In this report, Leq(h) is used to refer to the Leq sound level over a period of one hour.

Typical noise emission levels from construction equipment were derived from the Federal Highway Administration (FHWA) Roadway Construction Noise Model (RCNM), and construction noise levels were modeled with the RCNM. The model calculates noise by using empirical data for noise generated by construction equipment, mathematical formulae relating noise attenuation with distance, and information regarding the percentage of time that a certain piece of equipment is expected to be operated at maximum power while on-site during construction. The results of the noise model were used as a basis to evaluate potential construction-related noise levels at receptor locations in the vicinity of construction activities.

PROJECT CONSTRUCTION NOISE

Construction activity would occur in the vicinity of noise-sensitive receptors, including wildlife, residential receptors, and parkland users. In Bay Park, excavation for the installation of the force main would occur along 1st Avenue from Bayview Avenue south to Harbor Road. West of 1st Avenue in this portion of the alignment are residences and to the east is public parkland/playground. Excavation would continue east along Harbor Road to the eastern end of the peninsula at Marjorie Lane, then south on Marjorie Lane. South of Harbor Road and west of Marjorie Lane in this area is the Bay Park Golf Course.

Open cut excavation and pipe installation would require heavy construction equipment such as excavators and/or backhoes, cranes, delivery trucks, and other equipment. For those residential receptors along 1st Avenue, located approximately 30 feet from the excavation, temporary noise levels during the noisiest construction activities could reach approximately 82 dBA while excavators, delivery trucks, and cranes operate together. The same noise levels could be expected in areas of the golf course located close to Harbor Road and west of Marjorie Lane. The elevated noise levels would migrate along the alignment with the construction activity, and no one area would experience these noise levels for the duration of the total construction period.

Horizontal directional drilling (HDD) sites and pipe pullback sites would be located or co-located at four areas along the alignment: in the park area south of the Bay Park Golf Course (Drill Rig 3 Pullback); on the southern part of Pearsalls Hassock (Drill Rig 2 and Drill Rig 3); at the approximate center of South Black Banks Hassock (Drill Rig 1 Pullback and Drill Rig 2 Pullback); and immediately north of the Long Beach Water Pollution Control Plant (WPCP) (Drill Rig 1). If the contractor selects the trestle option for the installation of Pipeline Section 1, a temporary trestle would be installed to span the channel between North and South Black Banks Hassocks. The temporary trestle would be located approximately 800 feet from residential receptors. Construction equipment expected for these activities would consist of drill rigs, cranes, and other equipment, including a vibratory hammer and vibrator driver for trestle installation and removal.[1] Section 6.2.4 of the environmental assessment describes potential effects to marine species that would result from the trestle option.

[1] The FHWA, RCNM was used to estimate noise levels during construction of the proposed project. Because this model does not include noise levels associated with HDD machines, it is conservatively estimated that the HDD would generate similar noise to that of a vertical drill rig.

Two classes of receptors were considered for the potential noise impacts during HDD operations: human receptors (residential and recreational) and the fauna that use the hassock islands.

Pipe pullback activity on Pearsalls Hassock would be located approximately 500 feet west of the nearest bay shack. Noise levels at the bay shack associated with project construction on Pearsalls Hassock could reach approximately 57 dBA.

The behavioral response of waterfowl and shorebirds to noise stimuli appears to depend on the species, the intensity of the stimuli, and the ambient or background noise conditions. Some species of waterfowl and shorebirds have been accustomed to sensory stimuli that they do not perceive as threatening (Port Authority of New York and New Jersey 2004). At the individual level, physiological and behavioral responses of animals to anthropogenic noise generally include increased acute stress levels, increased heart rates, and fleeing from the source of the noise. However, such responses are usually in response to novel, newly introduced disturbances, and animals often gradually habituate to and tolerate loud noises after initial exposure (Bowles 1995).

At those location where HDD activity would occur on the hassock islands, noise levels would diminish considerably with distance from the source, especially considering the "soft" terrain over which it would travel. At 50 feet from the site, it is expected that sound levels would reach approximately 77 dBA during operation of the HDD rig or the pipe pulling rig. At a distance of 150 feet, noise levels are estimated to reach approximately 67 dBA. It is expected that animals disturbed by the construction activity would move to a different part of the hassock island until they become accustomed to the construction activity or until the activity is complete. The area represented by circle with radius of 150 feet is roughly 1.24 percent of the total area of North and South Black Banks Hassocks, and 1.15 percent of Pearsalls Hassock. It is expected that sufficient area exists within the hassock islands to accommodate the temporary displacement of wildlife that may be disturbed by construction activity.

Building demolition and construction for the diversion pump station would occur in the southern portion of the Long Beach WPCP. The noisiest part of the construction period is likely to be demolition associated with the development of a new pump station, while crews operate an excavator, a backhoe, and dump trucks and flatbed trucks. Noise levels at the residential area located approximately 80 feet to the south could reach approximately 76 dBA, and noise levels at the ball fields located approximately 140 feet to the west could reach approximately 71 dBA.

Construction activity would also occur at the three satellite pump stations that are located in residential neighborhoods along Park Avenue, one of the City's main roadways. Construction of the satellite pump stations is anticipated to start in the beginning of April 2022 and would be substantially complete by the end of September 2023, with final completion anticipated at the end of December 2023. This schedule is the same for each of the three satellite pump stations. Equipment involved may include a backhoe, jack hammer, cement mixing trucks, and small hand tools.

Construction activities for the pump station at Roosevelt Boulevard and East Park Avenue would occur approximately 80 feet from the nearest sensitive receptor—residences south of the site. Residences are located on either side of the Long Beach Fire Department site on West Park Avenue at Indiana Street, approximately 20 feet from the site.

Construction activities associated with hardening the three pump stations that occurs outside (e.g., platforms and installation of new light metal frame building) would result in temporary periods of elevated noise levels at nearby receptors.

CONCLUSION

Given that the operation of the proposed project would not generate noise, that construction of the proposed project proximate human receptors would comply with local noise ordinance, and that animals in the vicinity of construction activity could avoid disrupting noise by migrating to similar habitat nearby, no adverse noise impacts are expected.

REFERENCES

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