VILLAGE OF CENTRE ISLAND, NEW YORK
AND THE ISSUE OF PRIVATE-USE HELIPADS
October 29, 2018
Approved by Board of Trustees December 19, 2018

This report is intended to set a basis for informed decision making by the Village Board of Trustees (Board) with regard the appropriate treatment of existing and future helicopter use in the Village.

Current Status

There are three known privately-owned helipads in operation in the Village. Upon information and belief, the owners of these helipads contract with helicopter operators to provide on-demand air transport services. Residents in the Village have complained about the noise impacts, the negative effects of rotor down wash, and other nuisances that they have experienced from these helicopter operations. The Village has engaged our services to recommend appropriate action to eliminate or mitigate these negative impacts.

Aircraft Noise

Noise may be defined in many ways, and what is "noisy" to some people is not to others. Generally, noise may be defined as "unwanted sound" and is highly subjective. Aircraft noise is different from the noise created by railways or busy roads because it reaches a much wider area and cannot be shielded by barriers along the flight route. In order to graphically illustrate the noise impacts generated by a single landing and takeoff of the types of helicopters commonly used in the Long Island, New York region, the Village retained the services of HMMH, an internationally recognized noise consultancy. HMMH modeled the sound exposure levels for different helicopter models and flight routes as shown in Appendix A. It is noted that the noise levels increase as the distance to the helipad decreases. The HMMH contours are based on data the FAA collects on each aircraft that it certifies for operation and flight procedures provided by the manufacturer. HMMH has not conducted noise measurements of the helicopters modeled nor of ambient noise levels in the Village.

The sound exposure level can be characterized as beginning at some point when the sound of an individual helicopter can be distinguished above a threshold of ambient sound level; reaching a maximum level; then diminishing until it is no longer heard. The sound exposure level is determined as representing the level of a continuous one-second sound that contains the same amount of energy as the complete noise event and is expressed as decibels at the A weighting (dBA.) The "A" denotes the sound level as perceived by the human ear and is the most common measurement of sound and environmental noise. Sound levels are based on a logarithmic scale that ranges from 0 dBA to about 140 dBA and approximates the range of human hearing. The threshold of human hearing is about 0 dBA; less than 30 dBA is very quiet; 30-60 dBA is quiet; 60-90 dBA is moderately loud; 90-110 dBA is very loud; and 110-130 is uncomfortably loud. A 10-decibel increase in sound levels is perceived as a doubling of the loudness.

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The figures on the following three pages are presented as aids in assessing specific dBA levels. Figure 1 lists typical sound levels (dBA) of common indoor and outdoor sound sources. Figure 2 illustrates the relationship between speech intelligibility, sound level and distance. Figure 3 depicts the maximum percent of the exposed population expected to be awakened due to a particular dBA sound level.

Helicopter noise has a character all its own. Although a portion of the noise emanates from the engines themselves, the uniqueness of helicopter noise is mostly due to the modulation of sound created by the relatively slow-turning main rotor. This sound modulation is referred to as blade slap and is most pronounced during low-speed descents and high-speed cruise. To a listener on the ground, it is most audible as the aircraft approaches. Figure 4 depicts the normal sound level range of helicopter operations measured at a distance of 250 feet. The helicopters modeled by HMMH are those identified as operating or potentially could be used by the Centre Island helicopter operators and have gross takeoff weights and engines indicated below:

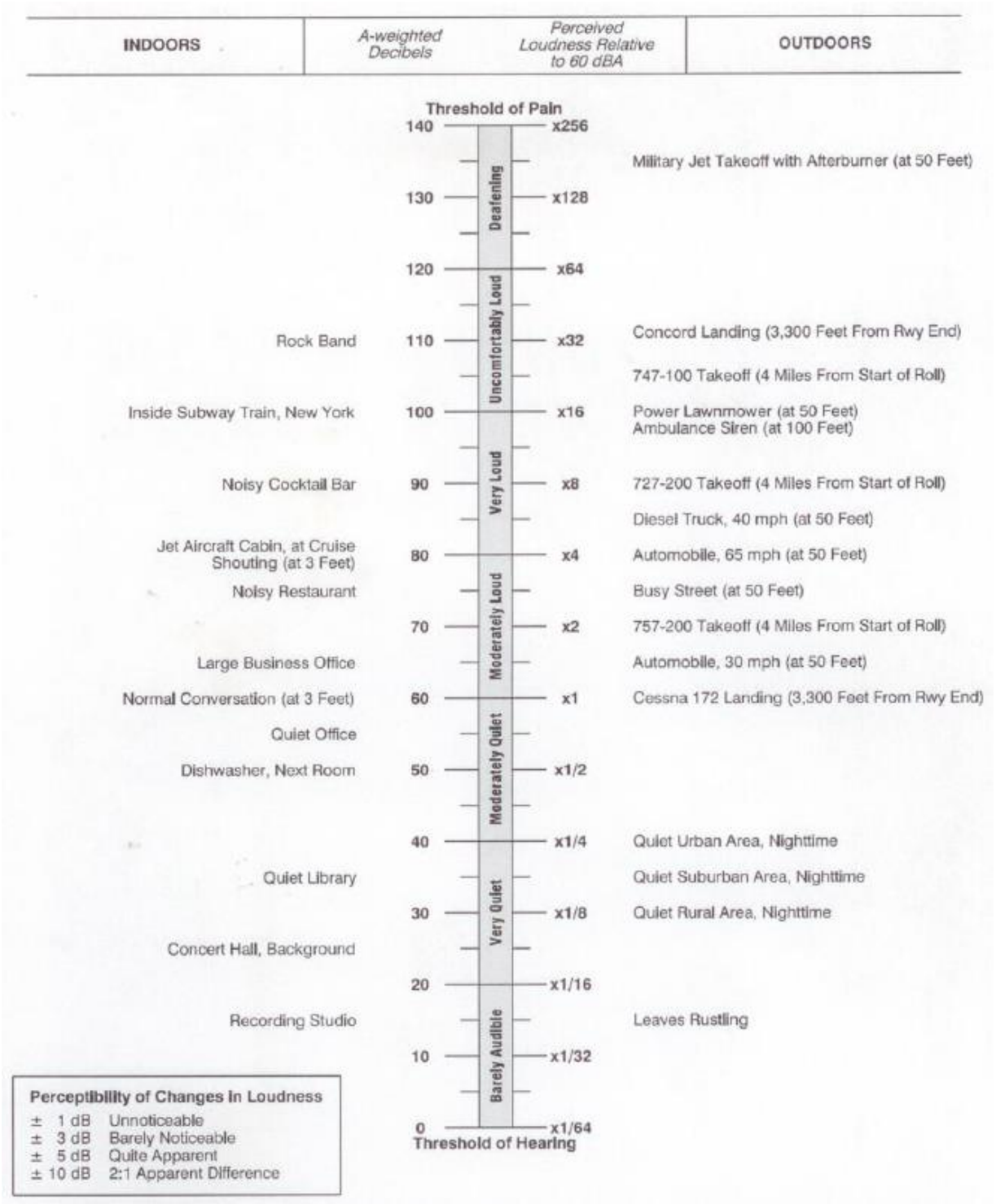
- Agusta Westland 139 -- 14,110 pounds, turbine engines
- Airbus AS355N (Twin Star) -- 5,732 pounds, turbine engines
- Bell 430 -- 9,300 pounds, turbine engines
- Sikorsky S-76C -- 11,700 pounds, turbine engines

The most widely used assessment of aircraft noise levels utilizes a time-weighted cumulative metric. This metric was developed, in part, in response to the Aviation Safety and Noise Abatement Act of 1979 (ASNA) enacted in February 1980 to provide assistance to encourage airport operators to prepare and carry out noise compatibility programs, among other purposes. ASNA required the FAA to promulgate regulations to meet three key requirements:

- Establish a single, uniform, repeatable system for considering aviation noise around airport communities.
- Establish a single system for determining noise exposure from aircraft, which takes into account noise intensity, duration of exposure, frequency of operations, and time of occurrence.
- Identify land uses that are normally compatible with various exposures of individuals to noise.

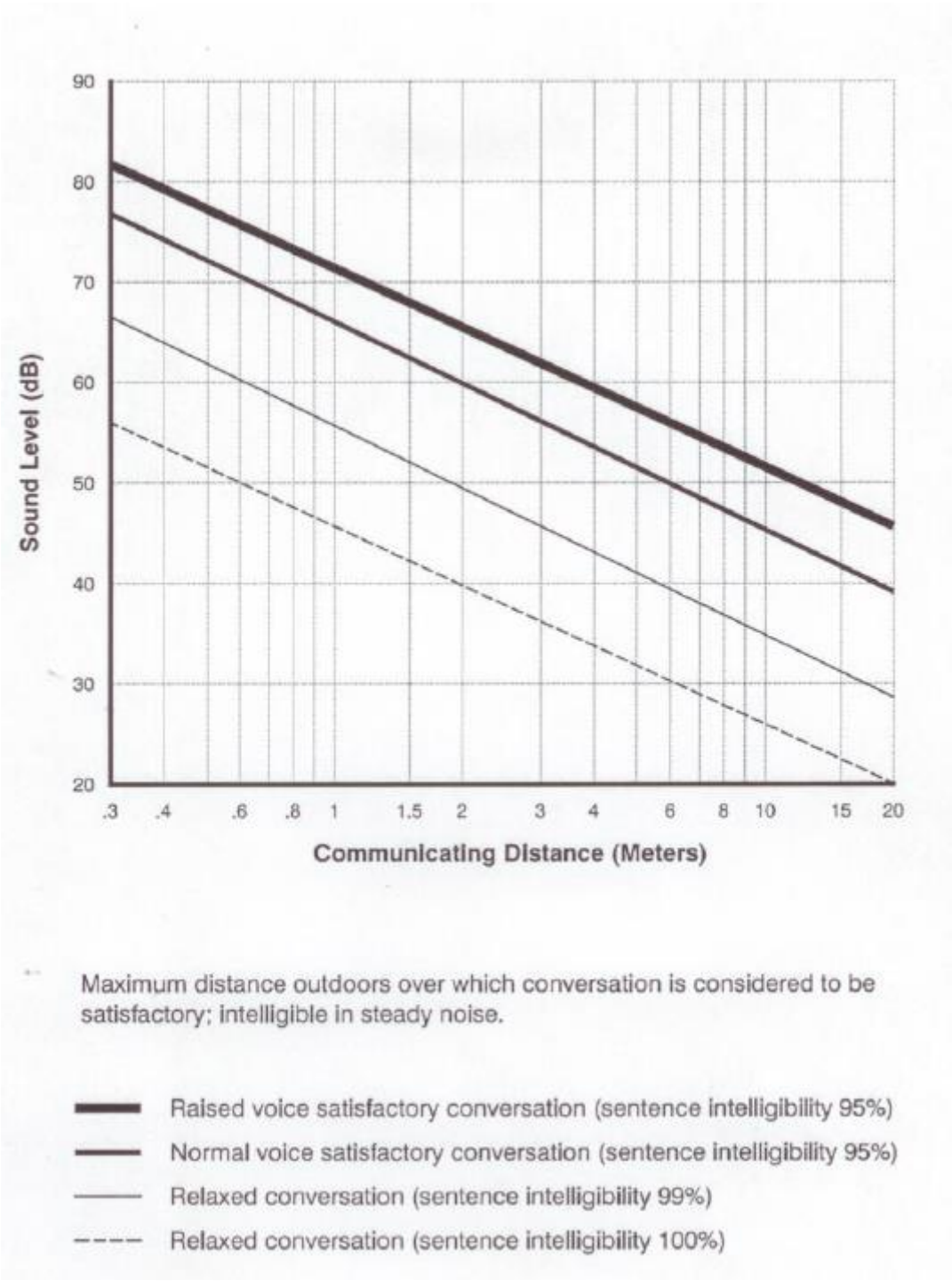
To implement the requirements established under ASNA, the FAA then published 14 Code of Federal Regulations (CFR) Part 150, more commonly known as "Part 150." Adopting Federal Land Use guidelines established in 1980 by the Federal Interagency Committee on Urban Noise (FICUN), Part 150 defined land use compatibility guidelines for aviation noise exposure. These guidelines consider land use compatibility for different uses over a range of DNL noise exposure levels, including the adoption of DNL 65 dBA as the limit for residential land use compatibility. The DNL is based on an average yearly number of aircraft operations (takeoffs and landings.) As stated in the 1981 Federal Register Notice announcing Part 150, FAA's goal is one of "reducing substantially the number and extent of noise sensitive areas in the vicinity of airports that are subject to significant noise exposure."

Figure 1
Typical Decibel Level of Common Sounds



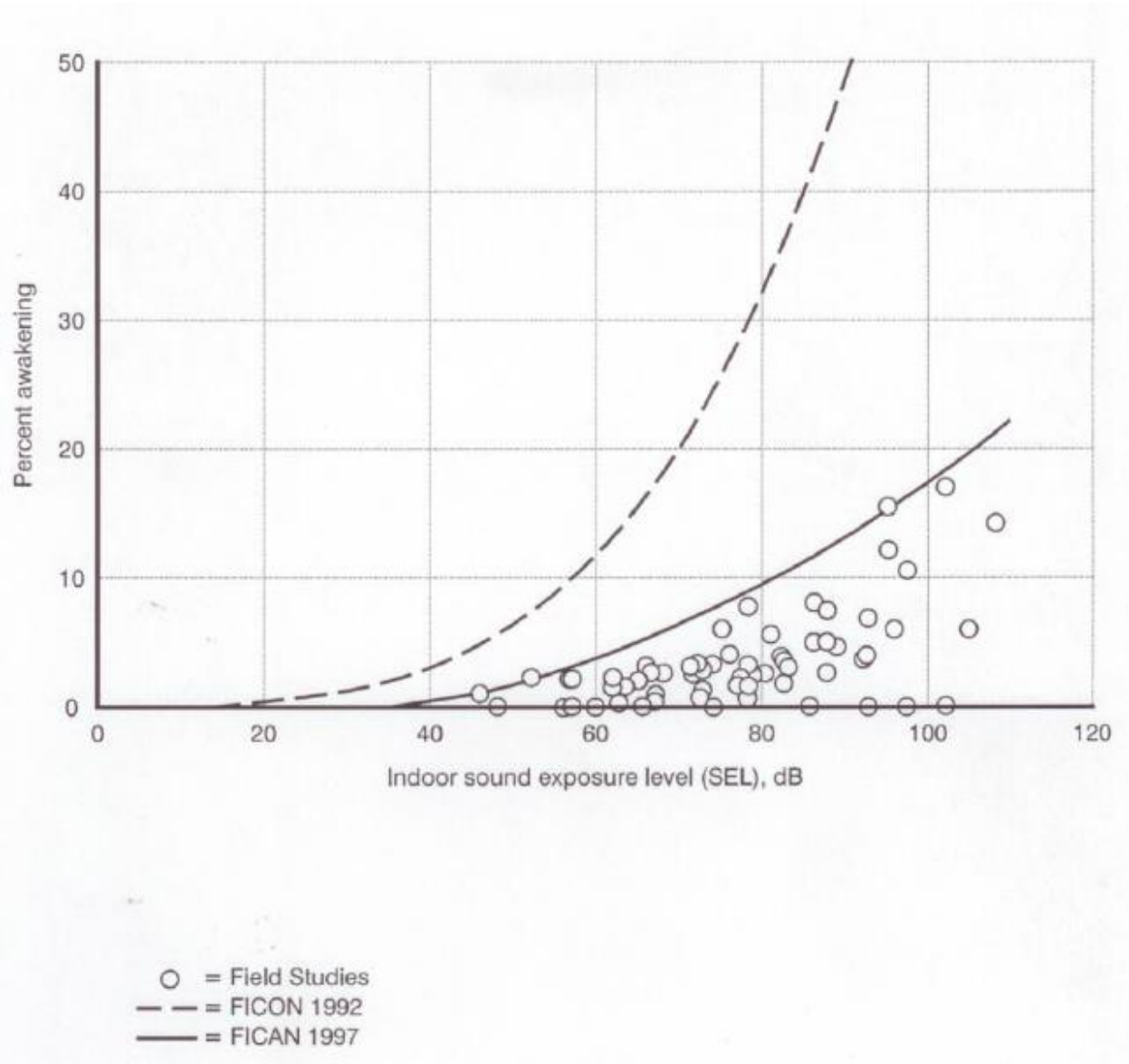
Source: California Land Use Planning Handbook, January 2002

Figure 2
Relationship Between Noise Levels and Conversation



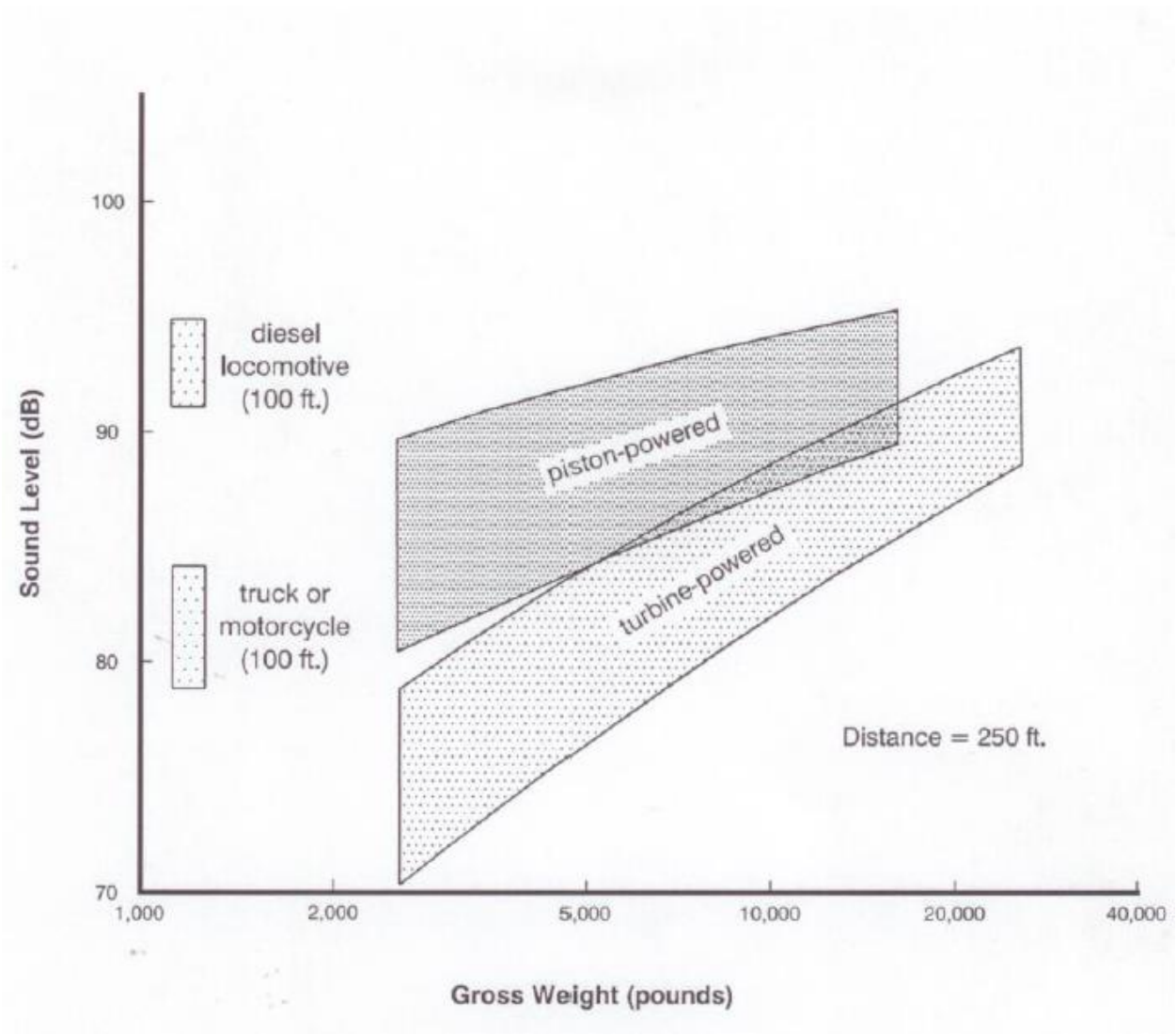
Source: U.S. Environmental Protection Agency, 1974

Figure 3
Sleep Disturbance Dose-Response Relationship



Source: Federal Interagency Committee on Noise (FICON), 1992
Federal Interagency Committee on Aviation Noise (FICAN), 1997

Figure 4
Helicopter Noise Levels



Source: Helicopter Association International, 1993

Table 1 on the following page identifies compatible land use with noise levels as presented in 14 CFR Part 150, Appendix A. This table is based on a cumulative noise level occurring over a yearly period and thus accounts for periods of noise and quiet, and nighttime noise between the hours of 10:00 p.m. and 7:00 a.m. are weighted more heavily to account for the widely assumed increase in people's sensitivity to noise during nighttime hours. Thus, the DNL 65 (also noted as 65 Ldn) is the threshold level related to residential land use.

In addition to the FAA, other federal agencies like the U.S. Department of Housing and Urban Development and the U.S. Department of Veterans Affairs use Federal Land Use guidelines based on DNL / Ldn contours in implementing their programs. They are guidelines only because the Federal government does not regulate land use. Although they are also used by many state and local jurisdictions for planning and development purposes, these jurisdictions have discretion to adopt their own lower local guidelines for land use and zoning purposes. They also have ultimate responsibility for determining the acceptability of land uses at particular noise levels. (https://www.faa.gov/regulations_policies/policy_guidance/noise/history/#threshold.)

The FAA and these other federal agencies recognize, however, that other measures of noise impact are useful in evaluating the public response to aircraft flights. This is particularly relevant at airports with intermittent or seasonal use, or that are located in relatively quiet, suburban or rural settings. This describes the setting of the privately-owned, private-use helipads in Centre Island. These supplemental metrics include use of the sound exposure level as presented in the HMMH report.

Cumulative noise exposure metrics reflect a combination of both the frequency of aircraft overflights and the loudness of those events. Any given noise exposure level can be the result of either a small number of noisy overflights or a high incidence of just moderately noisy events. A basic assumption in the use of cumulative noise contours for compatibility planning is that community reactions will be the same under each of these circumstances. Just as there are no absolute determinants of the noise level at which an individual person will be highly annoyed, there are no absolute scientific measures for establishing which land uses and noise exposures are or are not compatible with each other. The best outcome that can be achieved is compatibility criteria that will reflect what is appropriate for the communities involved. The use of single event noise level data, as reflected in the sound exposure level, is appropriate in determining the geographic extent of the area within which annoyance at aircraft overflight is a compatibility concern ("California Airport Land Use Planning Handbook", January 2002.)

The use of the sound exposure level metric serves to identify the geographic extent of the area within which annoyance, sleep disturbance and other impacts on normal daily activities are a compatibility concern. The sound exposure level contours included in Appendix A illustrate that nearly the entirety of Centre Island lies with 65 dBA contour and allows the Village to compare sound levels generated from various other activities and respond accordingly.

TABLE 1

LAND USE COMPATIBILITY* WITH YEARLY DAY-NIGHT AVERAGE SOUND LEVELS

Land Use	*Yearly Day-Night Average Sound Level (L_{dn}) in Decibels*					
	Below 65	*65-70*	*70-75*	*75-80*	*80-85*	*Over 85*
Residential						
Residential, other than mobile homes and transient lodgings	Y	N(1)	N(1)	N	N	N
Mobile home parks	Y	N	N	N	N	N
Transient lodgings	Y	N(1)	N(1)	N(1)	N	N
Public Use						
Schools	Y	N1)1	N(1)	N	N	N
Hospitals and nursing homes	Y	25	30	N	N	N
Churches, auditoriums, and concert halls	Y	25	30	N	N	N
Governmental services	Y	Y	25	30	N	N
Transportation	Y	Y	Y(2)	Y(3)	Y(4)	Y(4)
Parking	Y	Y	Y(2)	Y(3)	Y(4)	N
Commercial Use						
Offices, business and professional	Y	Y	25	30	N	N
Wholesale and retail—building materials, hardware and farm equipment	Y	Y	Y(2)	Y(3)	Y(4)	N
Retail trade—general	Y	Y	25	30	N	N
Utilities	Y	Y	Y(2)	Y(3)	Y(4)	N
Communication	Y	Y	25	30	N	N
Manufacturing And Production						
Manufacturing, general	Y	Y	Y(2)	Y(3)	Y(4)	N
Photographic and optical	Y	Y	25	30	N	N
Agriculture (except livestock) and forestry	Y	Y(6)	Y(7)	Y(8)	Y(8)	Y(8)
Livestock farming and breeding	Y	Y(6)	Y(7)	N	N	N
Mining and fishing, resource production and extraction	Y	Y	Y	Y	Y	Y
Recreational						
Outdoor sports arenas and spectator sports	Y	Y(5)	Y(5)	N	N	N
Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Nature exhibits and zoos	Y	Y	N	N	N	N
Amusements, parks, resorts and camps	Y	Y	Y	N	N	N
Golf courses, riding stables and water recreation	Y	Y	25	30	N	N

Numbers in parentheses refer to notes.

* The designations contained in this table do not constitute a Federal determination that any use of land covered by the program is acceptable or unacceptable under Federal, State, or local law. The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties and specific noise contours rests with the local authorities. FAA determinations under Part 150 are not intended to substitute federally determined land uses for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise compatible land uses.

KEY TO TABLE 1

SLUCM	Standard Land Use Coding Manual.
Y (Yes)	Land Use and related structures compatible without restrictions.
N (No)	Land Use and related structures are not compatible and should be prohibited.
NLR	Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.
25, 30, or 35	Land used and related structures generally compatible; measures to achieve NLR or 25, 30, or 35 dB must be incorporated into design and construction of structure.

In the Aviation Safety and Noise Abatement Act (ASNA), Congress directed the FAA, among other things, to identify land uses that are normally compatible with various exposures of individuals to noise. The result was Table 1 in 14 CFR Part 150, as depicted above. (Graphic: FAA)

Is there a Federal Role?

Yes.

The U.S. Congress has delegated authority for the use of the nation's airspace to the Federal Aviation Administration (FAA.) Once airborne, use of the airspace is governed by regulations administered by the FAA, whether the aircraft operates from a publicly- or privately-owned facility. The FAA's authority over airspace is exclusive, and neither airports nor local governments have any ability to regulate the flight of individual aircraft. The FAA has no authority to regulate land use in the vicinity of airports as this is viewed as a state and/or local issue (49 U.S. Code §40103 states, “The United States Government has exclusive sovereignty of airspace of the United." Also according to this law, "The Administrator of the FAA shall develop plans and policy for the use of the navigable airspace and assign by regulation or order the use of the airspace necessary to ensure the safety of aircraft and the efficient use of airspace."

The following section is taken from FAA Order 5190.6B, "Airport Compliance Manual", which is applicable only to public-use airports that receive grant funds from the federal Airport Improvement Program. It describes the federal perspective of aviation noise and local land use controls and may be viewed as setting a best practices level for communities with aviation facilities that have not accepted federal grants for airport capital improvements, which is the case in the Village.

"The legal framework with respect to abatement of aviation noise may be summarized as follows:

(1). The federal government has preempted the areas of airspace use and management, air traffic control, safety; and the regulation of aircraft noise at its source. The federal government also has substantial power to influence airport development through its administration of the Airport Improvement Program (AIP).

(2). *Other powers and authorities to control aircraft noise rest with the airport proprietor — including the power to select an airport site, acquire land, assure compatible land use, and control airport design, scheduling and operations — subject to constitutional prohibitions against creation of an undue burden on interstate and foreign commerce, and unreasonable, arbitrary, and unjust discriminatory rules that advance the local interest, other statutory requirements, and interference with exclusive federal regulatory responsibilities over safety and airspace management.*

Importantly:

(3). *State and local governments may protect their citizens through land use controls and other police power measures not affecting airspace management or aircraft operations."*

When airports receive grants from the FAA for capital projects, they accept a number of grant assurances and obligations that address a wide range of responsibilities of the grantee and generally carry for 20 years. Grant awards made for land acquisition have no expiration date. Grants are only available to publicly- and designated privately-owned airports/heliports that are open to public use. This is not the case for the Village as neither it nor the private helipad owners have received federal grant funds.

The FAA provides general advice with regard to airports and compatibility with land uses as indicated below:

"The compatibility of airport land uses is important to both the local government and the airport. Ensuring this compatibility requires understanding how an airport functions and how it can impact or be impacted by the community that surrounds it. These resources help local governments and airports understand their roles and offer ideas for compatible development."

In setting the various compatibility guidelines, the Part 150 regulations state that designations *"do not constitute a Federal determination that any use of land covered by the [noise compatibility] program is acceptable or unacceptable under federal, state or local law. The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties and specific noise contours rests with the local authorities. FAA determinations under Part 150 are not intended to substitute federally determined land uses for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise compatible land uses."*

Land use safety compatibility guidance from the FAA is limited to the immediate vicinity of the runway, the runway protection zones at each end of the runway, and the protection of navigable airspace. The FAA has no authority over off-airport land uses — its role is with regard to the safety of aircraft operations. The FAA's only leverage for promoting compatible land use planning is through the grant assurances that airport proprietors must adhere to in order to obtain federal funding for airport improvements, which does not apply to Centre Island. State and local agencies are free to set more stringent land use compatibility policies.

The above suggests that the Village, in approving helipad operations, should require the helipad owner to take action to protect surrounding landowners from noise, and pollution impacts and other negative impacts. The helipad owner should be required to fully consider the environmental effects, including noise, rotor downwash and air pollution, on adjacent properties as well as along anticipated flight paths. Consequently, measures to address aircraft noise and land use compatibility with regard to the privately-owned and private-use helipads in the Village rests solely with its governing body, under FAA policy.

Is there a State Role?

Yes.

New York State has an active role in the establishment, development and use of aviation facilities within its geographic limits. In addition to providing matching grants to supplement those offered by the FAA as well as its own grant funds, New York State has also enacted Business Law 249, which sets the requirements for privately-owned aviation facilities to be lawfully in operation. Excerpts of the General Business Law 249 that are pertinent to the privately-owned helipads in the Village are presented in the
section below.

"Approval of privately-owned airports. No person shall hereafter establish a privately-owned airport or make an airport improvement to an existing privately-owned airport except by authorization of the governing body of the city, village or town in which such airport or any part thereof is proposed to be established or improved. The governing *body of a city, village or town shall not authorize the establishment of such an airport or an airport improvement at a*

requested location unless in accordance with the standards prescribed by the commissioner of transportation.

The local governing body of a city, village or town of transportation shall, prior to granting such authorization, request the commissioner of transportation to determine whether or not the establishment of such a privately-owned airport improvement complies with his standards. In order to make such a determination of compliance, the commissioner of transportation must first make findings of fact (1) that operations of such airport will not conflict with or affect the safety of public buildings or facilities, or operations on public highways or waterways; and (2) that the volume, character and direction of traffic at such airport will not constitute a menace to the safety of operations at other airports in the vicinity. Approval for the establishment of such an airport or airport improvement may be subject to any reasonable conditions which the commissioner of transportation may deem necessary to effectuate the purposes of this section."

The terms "aircraft" and "airport" are defined in General Business Law 240 as follows:

"Aircraft" means any contrivance, now or hereafter invented, for avigation of or flight in the air, except a parachute or other contrivance designed for use, and carried primarily for safety equipment.

"Airport" means any landing area used regularly by aircraft for receiving or discharging passengers or cargo; or for the landing and take-off of aircraft being used for personal or training purposes."

The New York State Department of Transportation (NYSDOT) carries out the intent of General Business Law 249 and, in Section 75.3, there is a listing of documents required to support the siting of a new airport facility. One of the key requirements is evidence of a favorable airspace determination issued by the FAA for the proposed airport establishment or improvement. This FAA determination is the result of a filing by the proponent of FAA Form 7460-1, "Notice of Proposed Construction or Alteration" directly with the FAA. Such requests are to include the documents in Section 75.3 of General Business Law 249 and must be first approved by the Village, which then makes the application to the NYSDOT.

Regulations however well intended also need to be enforced. Enforcement then becomes a daily function at all hours of the day and requires the use of currently available technology to essentially track helicopter flight activity and correlate that to noise complaints. It is estimated that implementation of the technology to provide flight tracking data will cost about $22,000 each year with a 3 percent annual escalation. This excludes the cost of Village staff time to monitor the flight data, respond to noise complaints and take enforcement action.

What Action Can the Village Take to Control Helicopter Noise Impact?

1. Prohibit helicopter use in the Village, except for very limited purposes such as medical or other life-safety emergencies. It is recognized that life-threatening events associated with such activities as the transport of patients or body organs and tissues to Trauma 1 designated hospitals is typically time-is-of-the essence. Other on-demand use of helicopters can arise from police or fire department activities and those associated with emergency response actions. The ability to utilize helicopters for such activities should be considered acceptable to the general public at any time of the day or night and outweigh the human cost of a late response or none at all.

2. Regulate helicopter use: the Village cannot take any action to control the flight path or operation of the helicopter. These are decisions made by the pilot-in-command after taking into consideration a host of operational factors pertinent to the flight mission. Across the country, airport owners have sought to implement "fly friendly" procedures that have the objective of minimizing noise impacts. The trade associations representing helicopter operators have participated in defining these procedures. Nonetheless, they are strictly voluntary on the part of the pilot-in-command.

   To the best of our knowledge, the FAA is silent on use restrictions that local governments may impose on privately-owned, private-use aviation facilities, with the exception that such restrictions do not impact on the use of the navigable airspace. However, based on the FAA's recognition that land use is in the purview of local jurisdictions, the Village should be able to implement traditional land use control measures such as screening and property setbacks applicable to helipads. In the case of the latter, a review of the available research conducted by others in the industry indicates that a distance of three times the rotor diameter of the helicopter be adopted for mitigating the impact of rotor downwash on adjacent properties.

APPENDIX A

CENTER ISLAND SINGLE EVENT NOISE CONTOURS
HMMH Project Number 309810, May 3, 2018

This report and associated graphics are presented on the following pages.

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TECHNICAL MEMORANDUM

To:	Village of Centre Island 303 Centre Island Road Oyster Bay, NY 11771
From:	Chris Nottoli and Robert Mentzer Jr.
Date:	May 3, 2018
Subject:	Centre Island Single Event Noise Contours
Reference:	HMMH Project Number 309810

1. Background

HMMH is assisting the Village of Centre Island, NY, in modeling efforts to provide single event noise contours (SEL) for helicopter operations at two locations on the northern and southern area of Centre Island. The contours herein provide the community with an understanding to the relative exposures at various locations on the island. HMMH utilized the Federal Aviation Administration (FAA) Aviation Environmental Design Tool, Version 2d, (AEDT) for all modeling efforts. This technical memorandum summarized the modeling assumption used in AEDT along with the corresponding results.

2. Helicopter Selection and Procedures

Four helicopters were selected that frequently operate to and from Centre Island, NY, and include the Bell 430, Airbus AS355N (Twin Star), Sikorsky S-76 and the AgustaWestland 139[1]. HMMH adjusted the AEDT standard helicopter flight procedures to include an increased ground idle; helicopters operations to and from Centre Island generally remain running as they enplane and deplane. Table 1 through Table 4 present the aircraft selection along with the helicopter flight procedures.

3. Noise Metric Discussion

The following provides definitions of several of the terms used in this memorandum.

The Decibel (dB): All sounds come from a source – a musical instrument, a voice speaking, an airplane. The energy that produces these sounds is transmitted through the air in waves, or sound pressures, which impinge on the ear, creating the sound we hear.

The decibel is a ratio that compares the sound pressure of the sound source of interest (e.g., the aircraft over flight) to a reference pressure (the quietest sound we can hear). Because the range of sound pressures is very large, we use logarithms to simplify the expression to a smaller range, and express the resulting value in decibels (dB). Two useful rules of thumb to remember when comparing individual noise sources are: (1) most of us perceive a six to ten dB increase to be about a doubling of loudness, and (2) changes of less than about three dB are not easily detected outside of a laboratory.

A-Weighting Decibel (dBA): Frequency, or "pitch", is an important characteristic of sound. When analyzing noise, we are interested in how much is low-, middle-, and high-frequency noise. This breakdown is important for two reasons. First, our ears are better equipped to hear mid- and high-frequencies; thus, one finds mid- and high-frequency noise more annoying. Second, engineering solutions to noise problems are different for different frequency ranges. The "A" filter approximates the sensitivity of our ear and helps us to assess the relative loudness of various sounds.

[1] Helicopter selection provided in an email from James Brundige on April 10, 2018 titled "Feedback from Centre Island."

Maximum A-weighted Sound Level (LAmax): A-weighted sound levels vary with time. For example, the sound increases as an aircraft approaches, then falls and blends into the background as the aircraft recedes into the distance. We often describe a particular noise "event" by its maximum sound level (LAmax); two events with identical LAmax may produce different total exposures. One may be of very short duration, while the other may be much longer.

Sound Exposure Level (SEL): The most common measure of cumulative noise exposure for a single aircraft flyover is the Sound Exposure Level (SEL). Mathematically, it is the sum of the sound energy over the duration of a noise event – one can think of it as an equivalent noise event with a one-second duration. Since the SEL is normalized to one second, it will typically be larger in magnitude than the LAmax for the event. In fact, for most aircraft events, the SEL is about 7 to 12 dB higher than the Lmax. Therefore, it is important to remember that SEL levels are higher than what people experience. Also, the fact that it is cumulative measure means that a higher SEL can result from either a louder or longer event, or some combination.

Table 1. Bell 430 Arrival and Departure Procedure

Helicopter	Operation Type	Step Number	Step Description	Hover Time (seconds)	Track Distance (feet)	Altitude (AGL)	Speed (knots)
Bell 430 (B430)	Arrival	1	Start altitude	0	0	1,000	122
		2	Level fly	0	87,250	0	0
		3	Approach horizontal decelerate	0	5,000	0	60
		4	Approach at constant speed	0	4,800	500	0
		5	Approach descend accelerate	0	2,850	15	0
		6	Approach vertical	3	0	0	0
		7	Flight idle (FIDLE)	30	0	0	0
		8	Ground idle (GIDLE)	420[1]	0	0	0
	Departure	1	Ground idle (GIDLE)	420[1]	0	0	0
		2	Flight idle (FIDLE)	30	0	0	0
		3	Departure vertical	3	0	15	0
		4	Departure horizontal accelerate	0	100	0	30
		5	Departure climb accelerate	0	500	30	72
		6	Depart at constant speed	0	3,500	1,000	0
		7	Departure horizontal accelerate	0	2,800	0	122
		8	Level fly	0	93,100	0	0

Notes: [1] AEDT standard ground idle (GIDLE) time is 30 seconds.

Table 2. Sikorsky S-76C Arrival and Departure Procedure

Helicopter	Operation Type	Step Number	Step Description	Hover Time (seconds)	Track Distance (feet)	Altitude (AGL)	Speed (knots)
Sikorsky S-76C (S76C)	Arrival	1	Start altitude	0	0	1,000	130
		2	Level fly	0	87,250	0	0
		3	Approach horizontal decelerate	0	5,000	0	74
		4	Approach at constant speed	0	4,800	500	0
		5	Approach descend accelerate	0	2,850	15	0
		6	Approach vertical	3	0	0	0
		7	Flight idle (FIDLE)	30	0	0	0
		8	Ground idle (GIDLE)	420[1]	0	0	0
	Departure	1	Ground idle (GIDLE)	420[1]	0	0	0
		2	Flight idle (FIDLE)	30	0	0	0
		3	Departure vertical	3	0	15	0
		4	Departure horizontal accelerate	0	100	0	30
		5	Departure climb accelerate	0	500	30	74
		6	Depart at constant speed	0	3,500	1,000	0
		7	Departure horizontal accelerate	0	2,800	0	130
		8	Level fly	0	93,100	0	0

Notes: [1] AEDT standard ground idle (GIDLE) time is 30 seconds.

Table 3. AgustaWestland 139[2] Arrival and Departure Procedure

Helicopter	Operation Type	Step Number	Step Description	Hover Time (seconds)	Track Distance (feet)	Altitude (AGL)	Speed (knots)
AgustaWestland 139[2] (A139)	Arrival	1	Start altitude	0	0	1,000	126
		2	Level fly	0	87,250	0	0
		3	Approach horizontal decelerate	0	5,000	0	69.6
		4	Approach at constant speed	0	4,800	500	0
		5	Approach descend accelerate	0	2,850	15	0
		6	Approach vertical	3	0	0	0
		7	Flight idle (FIDLE)	30	0	0	0
		8	Ground idle (GIDLE)	420[1]	0	0	0
	Departure	1	Ground idle (GIDLE)	420[1]	0	0	0
		2	Flight idle (FIDLE)	30	0	0	0
		3	Departure vertical	3	0	15	0
		4	Departure horizontal accelerate	0	100	0	30
		5	Departure climb accelerate	0	500	30	69.4
		6	Depart at constant speed	0	3,500	1,000	0
		7	Departure horizontal accelerate	0	2,800	0	126
		8	Level fly	0	93,100	0	0

Notes: [1] AEDT standard ground idle (GIDLE) time is 30 seconds.

[2] The A139 is modeled as the SA330J in AEDT

Table 4. Airbus AS355N Arrival and Departure Procedure

Helicopter	Operation Type	Step Number	Step Description	Hover Time (seconds)	Track Distance (feet)	Altitude (AGL)	Speed (knots)
Airbus AS355N (SA355F)	Arrival	1	Start altitude	0	0	1,000	116
		2	Level fly	0	87,250	0	0
		3	Approach horizontal decelerate	0	5,000	0	63
		4	Approach at constant speed	0	4,800	500	0
		5	Approach descend accelerate	0	2,850	15	0
		6	Approach vertical	3	0	0	0
		7	Flight idle (FIDLE)	30	0	0	0
		8	Ground idle (GIDLE)	420[1]	0	0	0
	Departure	1	Ground idle (GIDLE)	420[1]	0	0	0
		2	Flight idle (FIDLE)	30	0	0	0
		3	Departure vertical	3	0	15	0
		4	Departure horizontal accelerate	0	100	0	30
		5	Departure climb accelerate	0	500	30	63
		6	Depart at constant speed	0	3,500	1,000	0
		7	Departure horizontal accelerate	0	2,800	0	116
		8	Level fly	0	93,100	0	0

Notes: [1] AEDT standard ground idle (GIDLE) time is 30 seconds.

4. Flight Track Geometry

HMMH used the provided flight tracks to model arrival and departure operations at each helipad location[2]. Figure 1 and Figure 2 present the modeled helicopter tracks.

[2] Flight track geometry provided in an email from James Brundige on April 9, 2018 title "Helicopter Types for Contours."

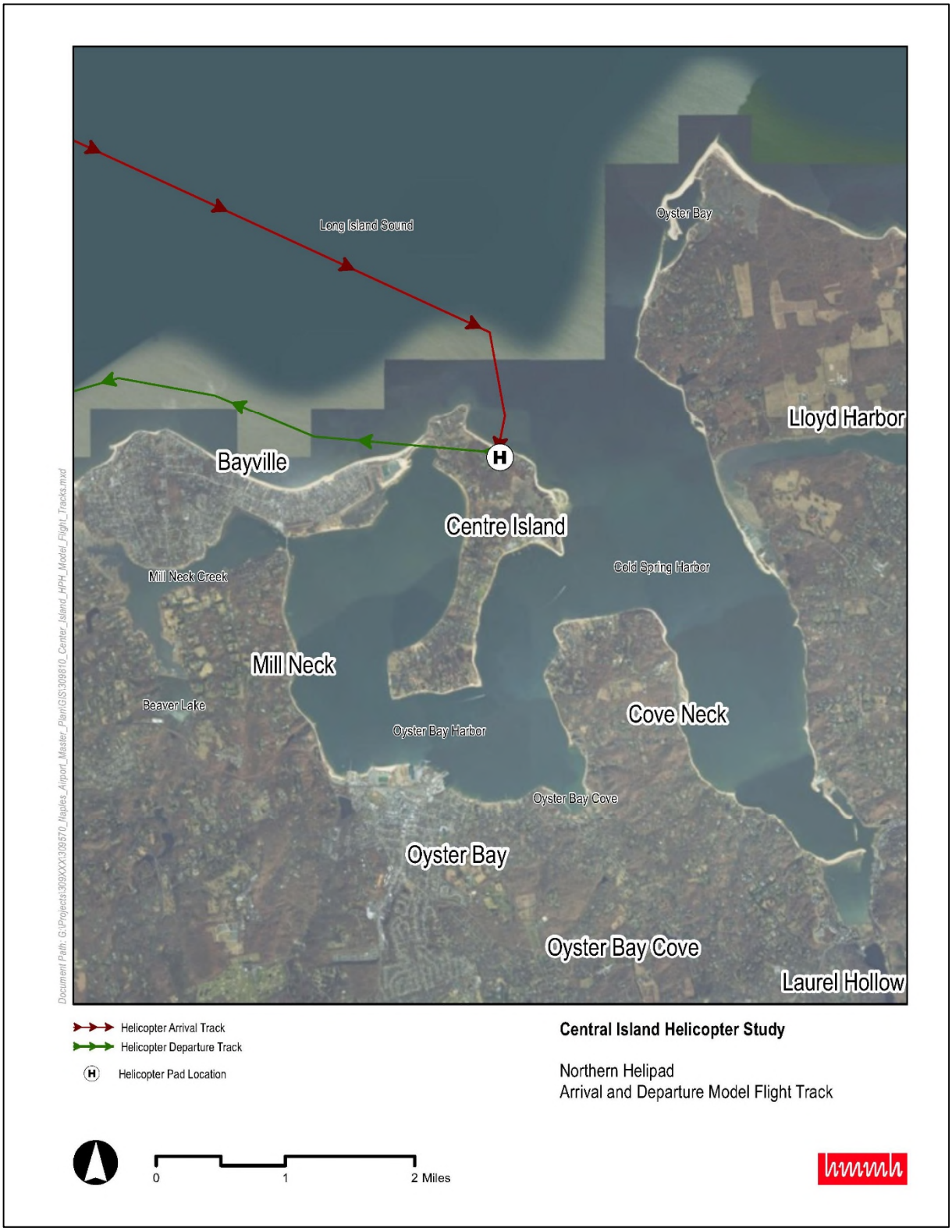

Figure 1. North Helipad Model Flight Tracks

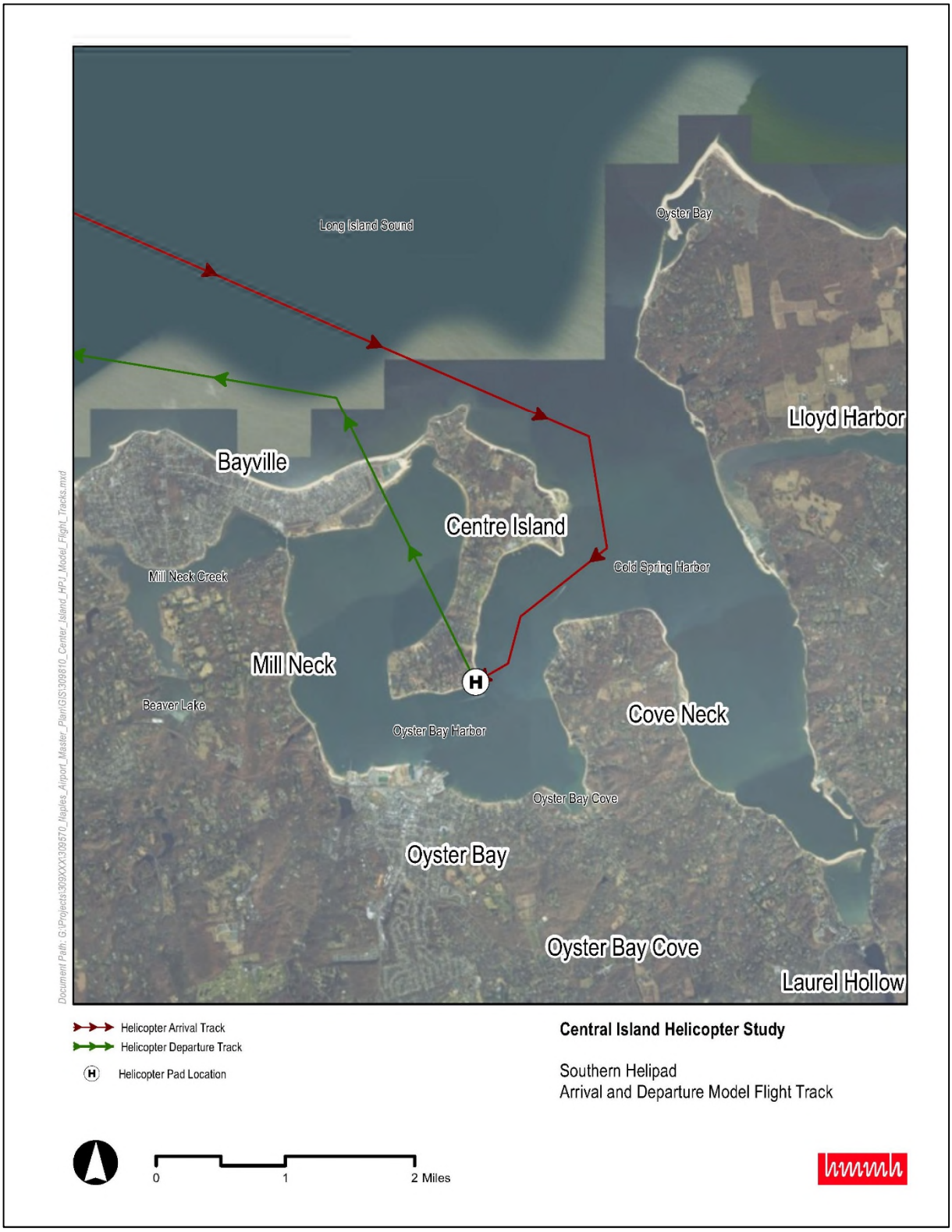

Figure 2. Southern Helipad Model Flight Tracks

5. Meteorological Conditions

AEDT has several settings that affect aircraft performance profiles and sound propagation based on meteorological data. Meteorological settings include average annual temperature, barometric pressure, and relative humidity at the airport. Since there are no existing airports on Centre Island, HMMH identified Long Island MacArthur Airport (ISP) as a nearby substitute for weather conditions. The AEDT default values for annual average weather conditions near Centre Island:

- Temperature: 52.0° F
- Sea-level Pressure: 1017.2 millibars
- Relative Humidity 70.0%
- Dew Point: 42.8° F
- Wind Speed: 7.9 Knots

6. Terrain Data

Terrain data describes the elevation of the ground surrounding the airport and on airport property. The AEDT uses terrain data to adjust the ground level under the flight paths. The terrain data does not change the aircraft's performance or noise levels, but does alter the vertical distance between the aircraft and a "receiver" on the ground. HMMH obtained the terrain data from the United States Geological Survey (USGS) National Map Viewer and utilized this in conjunction with the terrain feature of the AEDT to generate the noise contours at Centre Island.

7. Results

Figure 3 through Figure 17 present the arrival and departure SEL contours at each helipad location by aircraft type.

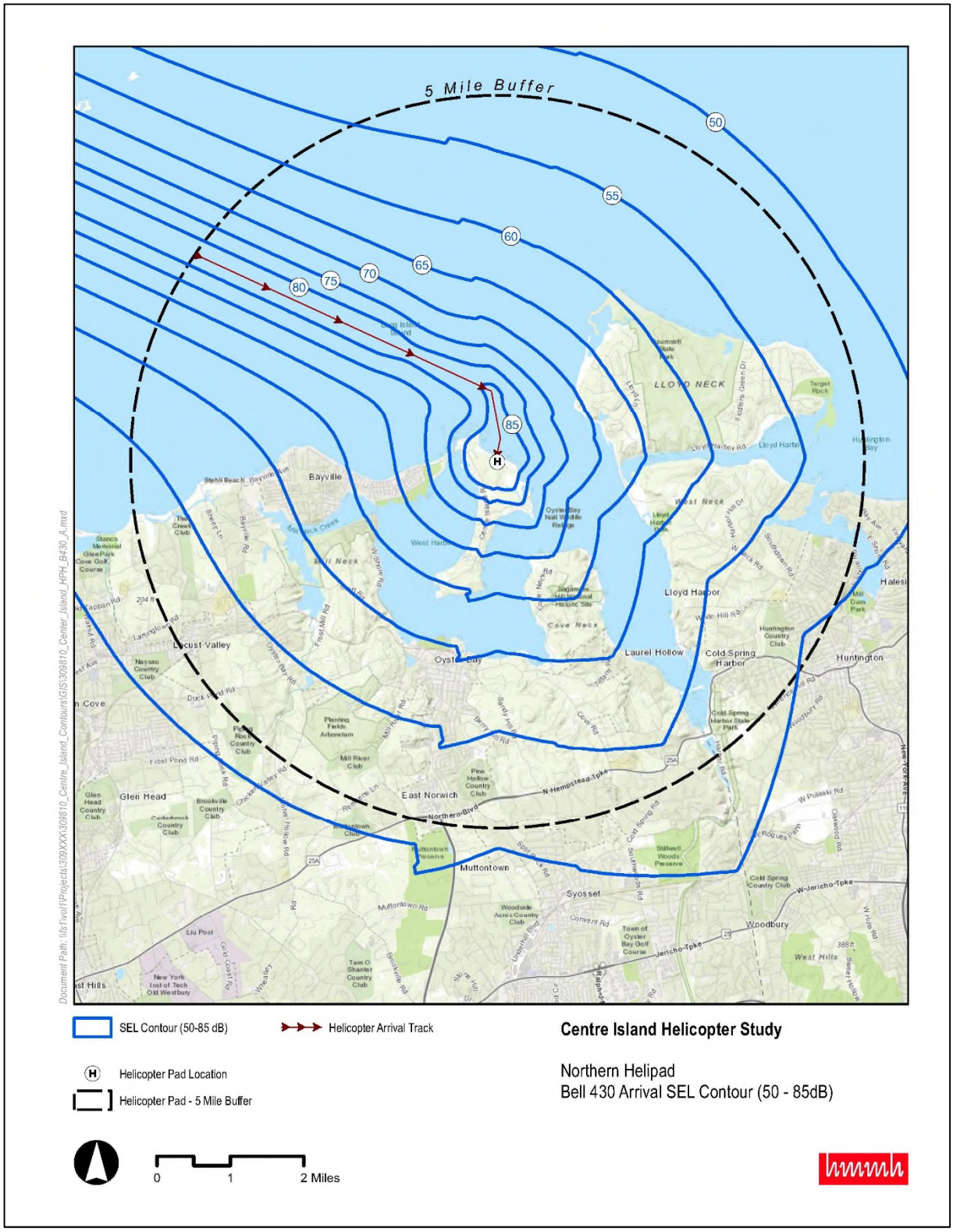

Figure 3. Northern Helipad – Bell 430 Arrival SEL Contour

Figure 4. Northern Helipad – Bell 430 Departure SEL Contour

Figure 5. Northern Helipad – Sikorsky S-76C Arrival SEL Contour

Figure 6. Northern Helipad – Sikorsky S-76C Departure SEL Contour

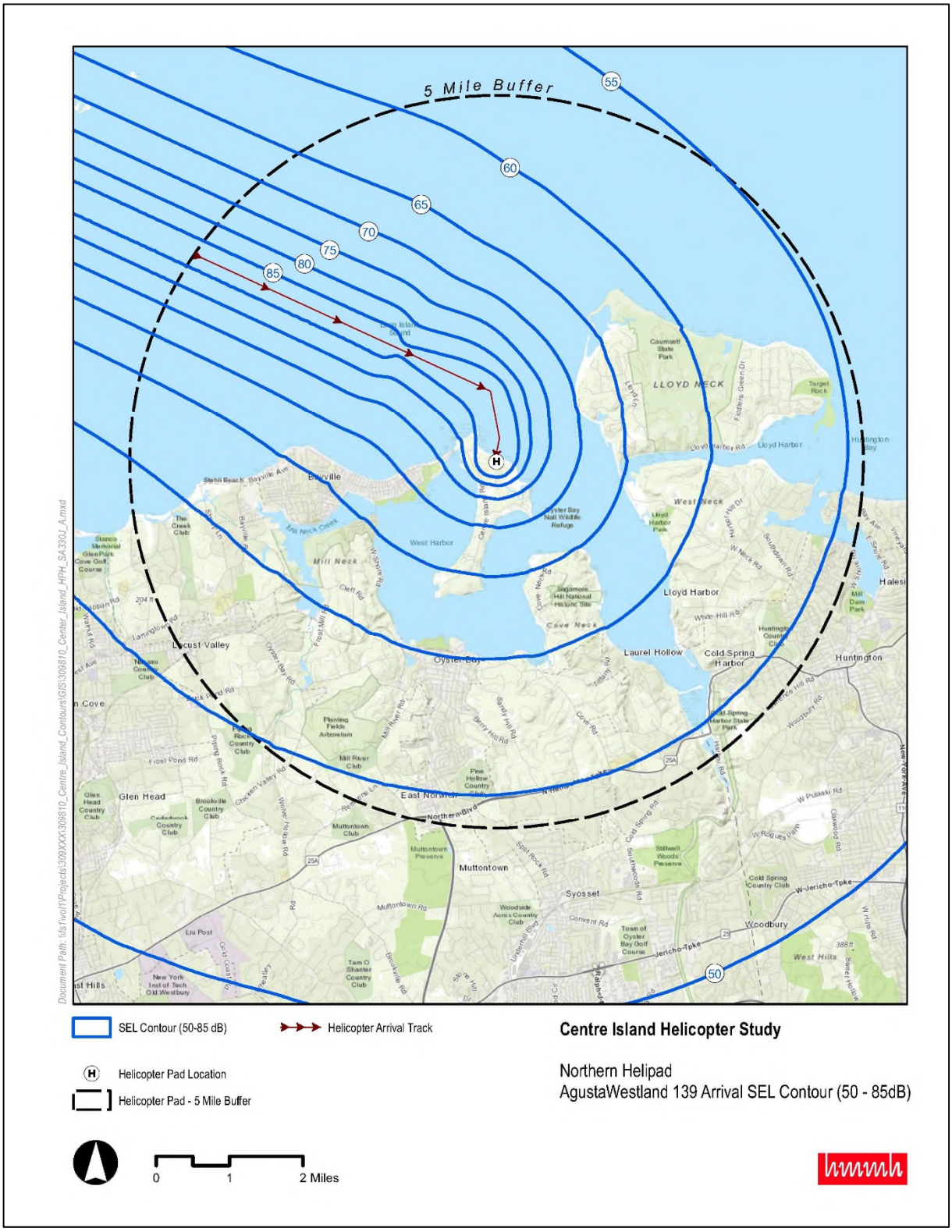

Figure 7. Northern Helipad – AgustaWestland 139 Arrival SEL Contour

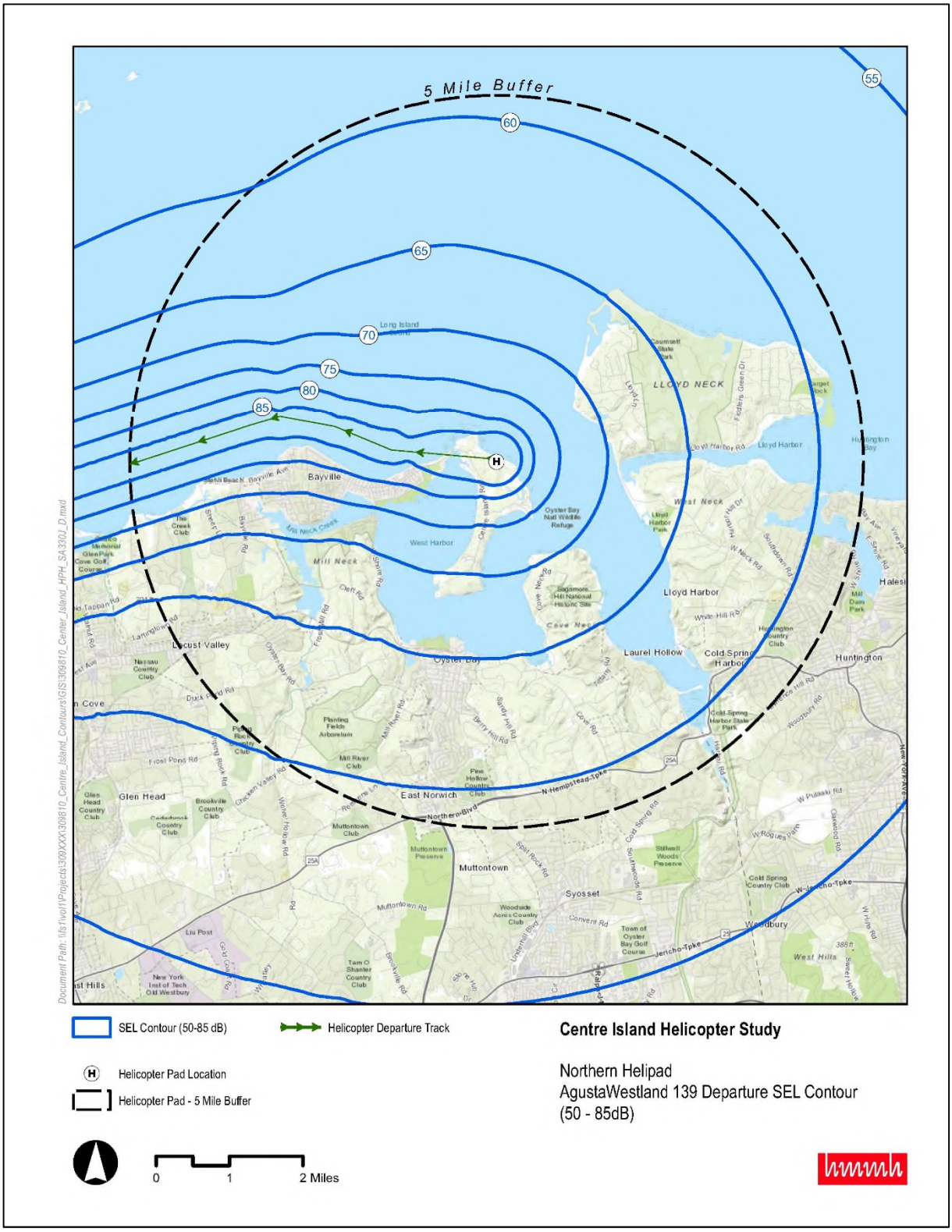

Figure 8. Northern Helipad – AgustaWestland 139 Departure SEL Contour

Figure 9. Northern Helipad – Airbus AS355N Arrival SEL Contour

Figure 10. Northern Helipad – Airbus AS355N Departure SEL Contour

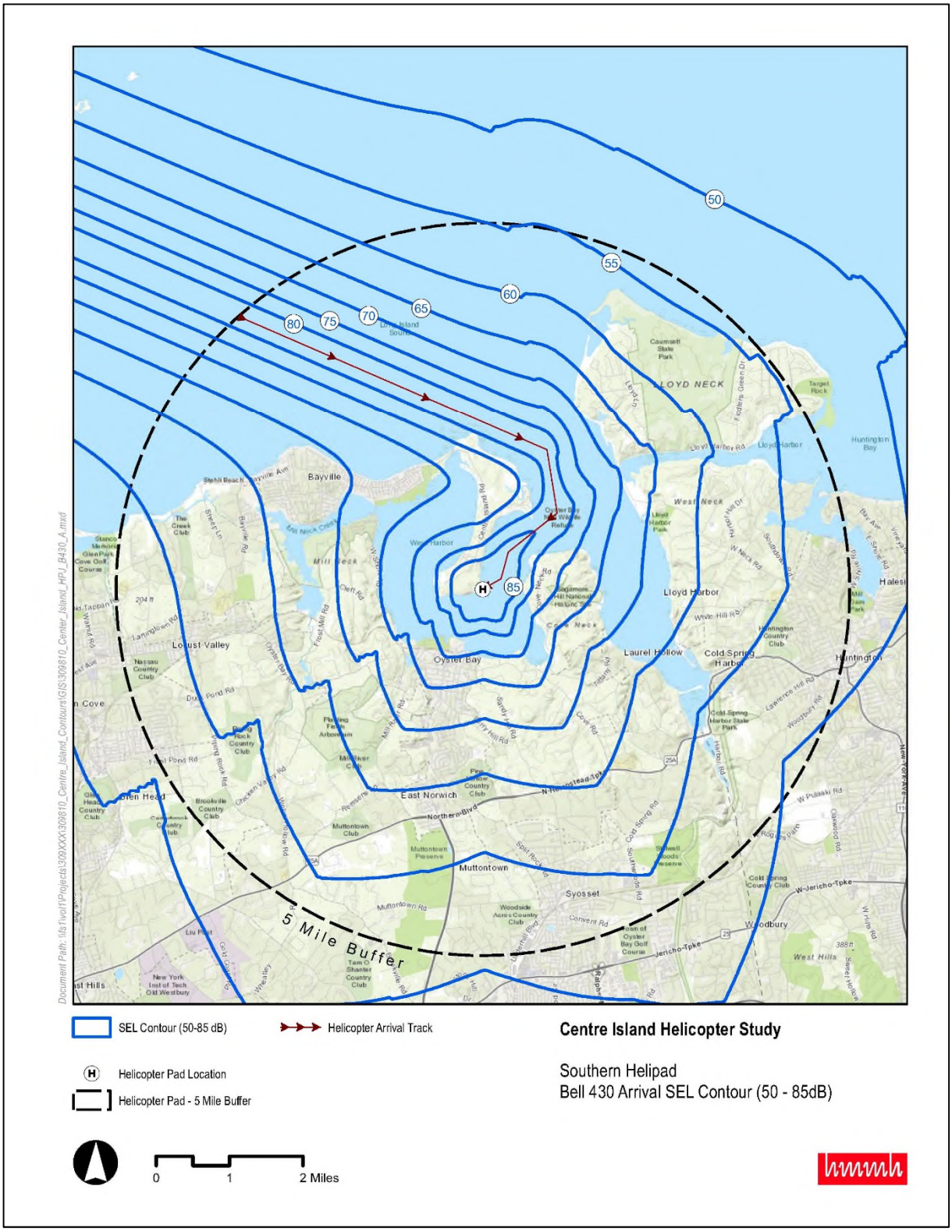

Figure 11. Southern Helipad – Bell 430 Arrival SEL Contour

Figure 12. Southern Helipad – Bell 430 Departure SEL Contour

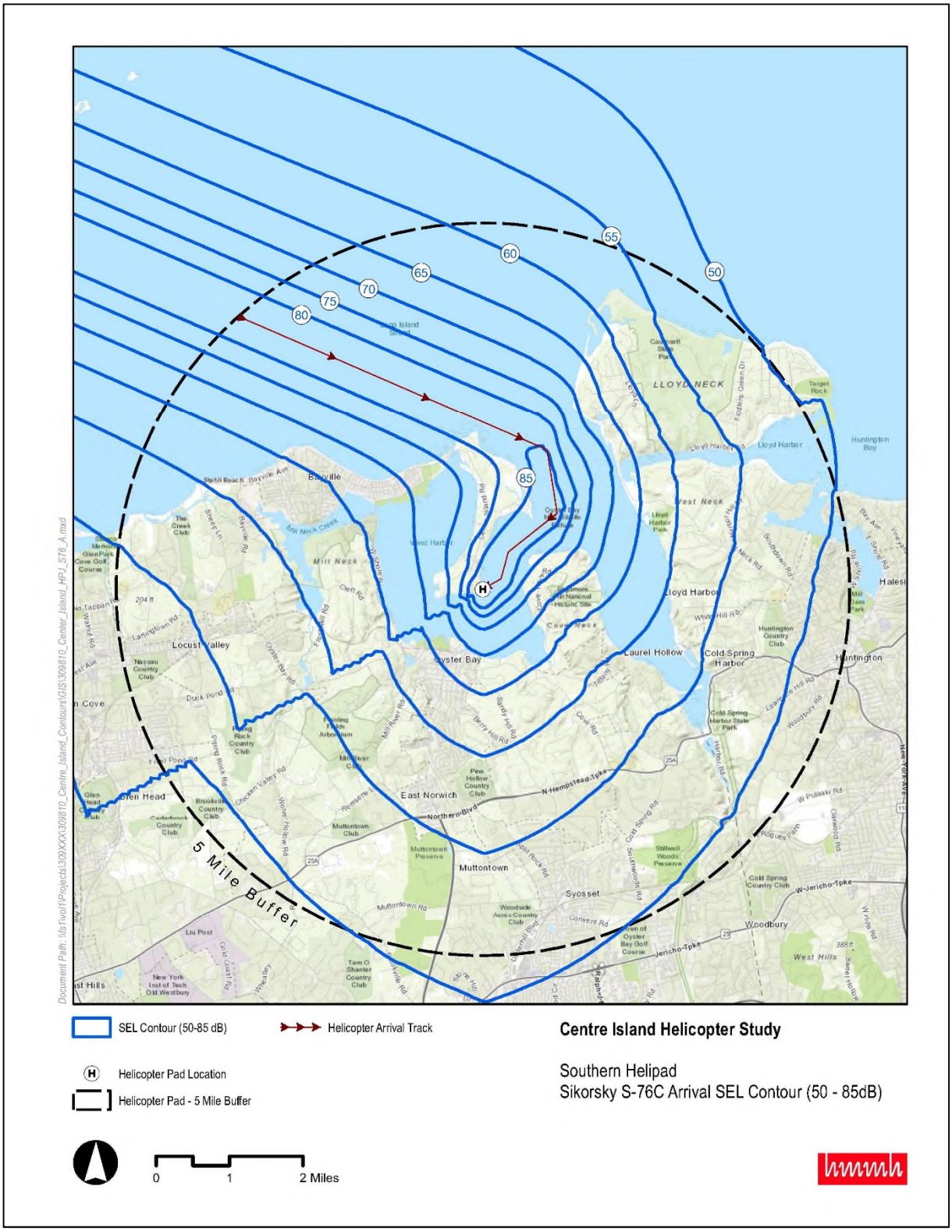

Figure 15. Southern Helipad – Sikorsky S-76C Arrival SEL Contour

Figure 13. Southern Helipad – Sikorsky S-76C Departure SEL Contour

Figure 14. Southern Helipad – AgustaWestland 139 Arrival SEL Contour

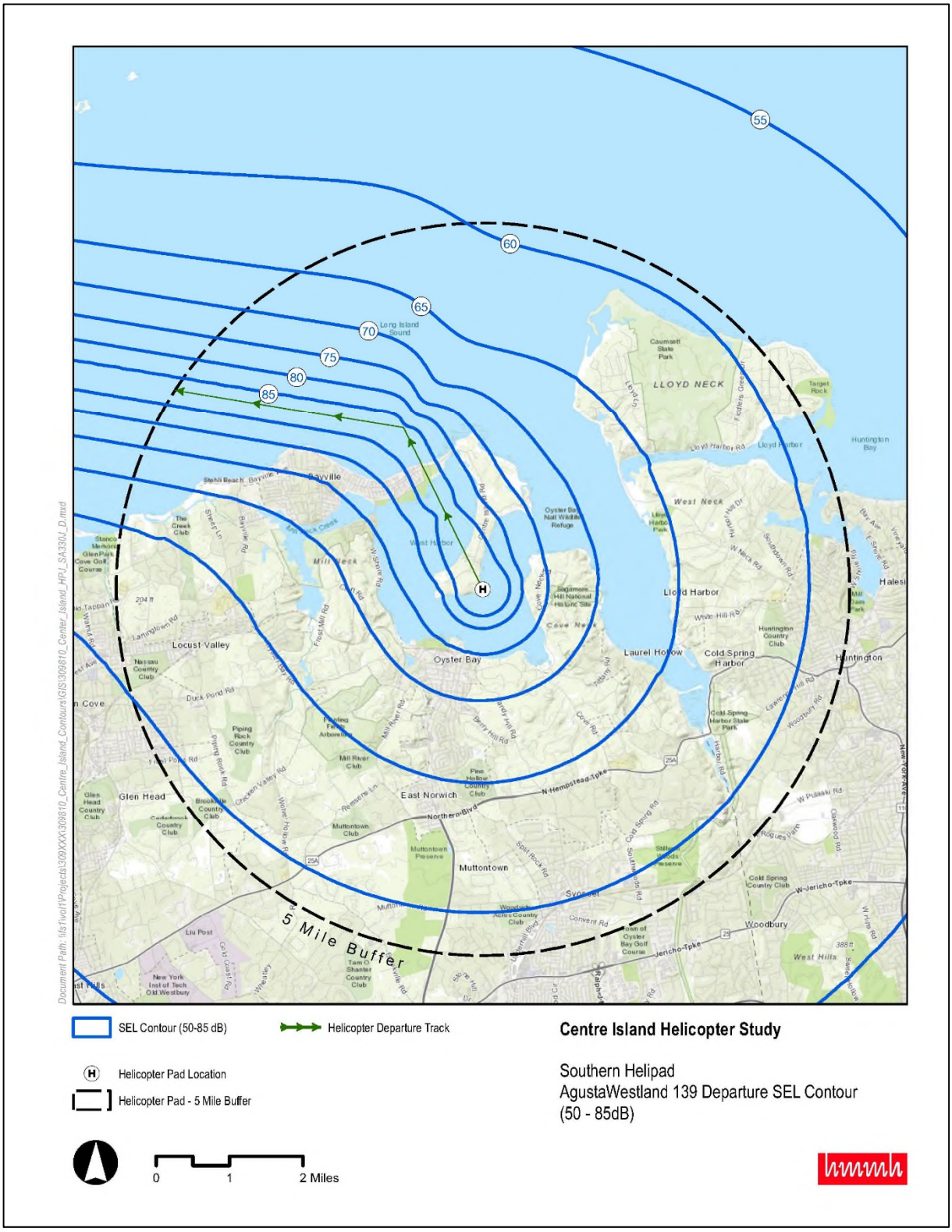

Figure 15. Southern Helipad – AgustaWestland 139 Departure SEL Contour

Centre Island Helicopter Study

Southern Helipad
Airbus AS355N Arrival SEL Contour (50 - 85dB)

Figure 16. Southern Helipad – Airbus AS355N Arrival SEL Contour