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TECHNICAL MEMORANDUM

To: Ms. Diana Weir, Town of East Hampton, and the East Hampton Airport Noise Study Advisory Group

From: Robert Miller, Chris Bajdek

Date: 5 September 2003

Subject: East Hampton Airport Noise Mitigation Program

Preliminary Results of the Noise Measurement Program; Phase I – June 25th to July 8th 2003

Reference: HMMH Jon No. 299500

The East Hampton Airport Noise Study Advisory Group (NSAG) is comprised of the following individuals, listed alphabetically by last name:

- Rob Coe, East Hampton/South Hampton CAC
- Kyle Collins, Director, Southampton Town Planning Department
- Arthur French
- Cindy Herbst, Sound Aircraft Services
- Samuel Kramer
- Thomas Lavinio, East Hampton Aviation Association
- Robert Miller, HMMH
- Michael Myers, Myers Aviation
- Joan Osborne, East Hampton Village Preservation Society
- Gene Oshrin, East Hampton Aviation Association
- Pat Ryan, East Hampton Airport
- Jean Sinenberg
- William Tillotson, Chairperson, Sagaponack CAC
- Robert Wood, Citizens for Quieter Airport
- Matthew Zuccaro, Eastern Region Helicopter Council

This memorandum is being distributed to NSAG members for review. It summarizes the first phase of a major measurement program designed to identify various characteristics of the noise caused by aircraft and helicopter operations at East Hampton Airport, and it will be the subject of discussions at the next NSAG meeting on 9 September at 5:30 p.m. in the East Hampton Airport Terminal Building.

Table of Contents

List of Figures

List of Tables

1. INTRODUCTION

Harris Miller Miller & Hanson Inc. (HMMH) was retained by the Town of East Hampton to conduct a study to address noise issues at East Hampton Airport (EHA). The overall objectives of the study are to define the current noise issues at EHA and to assess potential noise abatement measures that are both feasible and practical. The first part of the study consists of a field data collection process split into two phases. The first phase involves the initial collection of operations data as well as a preliminary set of noise measurements. The program was discussed at the first meeting of the NSAG on 24 June 2003, at the end of which various committee members volunteered potential sites for monitoring. Measurements began the following day at each of the recommended locations and extended over two weekends, including the July 4th holiday.

During this first phase of monitoring, several committee members who had offered their homes as candidate sites for measurement, expressed concern that aircraft and helicopter traffic was not operating as it normally did; that because the measurements had been discussed at the meeting, pilots were avoiding the airport, flying higher than normal, or not flying where they normally would.

To address this concern, the second phase of monitoring was planned and carried out without prior announcement to anyone other than the homeowners where the instrumentation was to be located. The second phase was initiated on August 21st and concluded on September 2nd, extending over two additional weekends and the Labor Day holiday. Data obtained during this second phase will be analyzed and reported in a second memorandum, with specific attention paid to whether there are any identifiable differences between the two periods.

The present memorandum summarizes only the results of our Phase I noise measurement program, which was carried out by HMMH personnel between June 25th and July 8th, 2003. The following sections provide an overview of the measurement program, site-by-site discussions of the field data obtained at each site, a brief discussion of how this information will be used in our analysis, and an overview of the next steps in the study. The appendices provide graphs and tables of measured noise level data obtained at each of the sites.

2. OVERVIEW OF NOISE MEASUREMENT PROGRAM: PHASE I

The first phase of the field data collection process had the following objectives:

- To collect Day-Night Sound Level (DNL) data at several representative community locations, for use in comparison to modeled noise contour levels;
- To collect representative single-event noise data for various aircraft types of concern;
- To observe aircraft flight paths in person, to improve the quality of our modeling assumptions; and
- To review available airport operating records.

Noise measurements were conducted at a total of seven sites in the area surrounding the airport. Table 1 documents the location of each site and the overall monitoring periods for Phase I. Figure 1 shows the locations of the noise monitoring sites in relation to the airport.

One of the volunteered locations, a rental property at 103 Merchants Path in Bridgehampton (identified as Site 2 in the table that follows), was owned by an NSAG member and believed to be unoccupied, but shortly after the instrumentation was installed, renters returned and requested that the instrumentation be removed. Thus, a second site, identified as 2a, was set up on an adjoining property at 93 Merchants Path,

where it remained for the duration of the measurement period. Because of the close proximity of the sites (approximately 200 feet apart), data from the two locations have been consolidated for analysis.

Table 1. Summary of Noise Monitoring Sites for Phase I

Site	Address	Start	End
		Date / Time	Date / Time
1	11 Highview Drive, Wainscott	25-June / 11:58	08-July / 15:00
2	103 Merchants Path, Bridgehampton	25-June / 12:47	26-June / 15:00
2a*	93 Merchants Path, Bridgehampton	26-June / 17:00	08-July / 12:58
3**	244 Widow Gravitts, Bridgehampton	25-June / 13:31	08-July / 16:46
4	75 West Gate, Wainscott	25-June / 15:24	08-July / 16:17
5***	Georgica Estates Tennis Courts, East Hampton	26-June / 12:33	08-July / 15:25
6	Ross School Athletic Fields, Wainscott	26-June / 11:22	02-July / 08:56
7	136 Main Street, East Hampton Village	02-July / 09:58	08-July / 10:55

Notes:
* Unrecovered interval data from 15:00 on June 27th to 17:00 on June 28th during file transfer to floppy disk.
** Unrecovered interval data from 14:00 to 15:00 on July 7th.
*** Unrecovered interval data from 21:36 on July 6th to 14:00 on July 7th due to a loss of battery power.

Observations and preliminary results of the measurements at each site are discussed individually by location. The appendices that follow include detailed measurement data from each site, presenting information such as background noise levels and maximum sound levels hour by hour throughout the entire measurement period, daily noise exposure levels, single-event noise levels caused by individual aircraft and non-aircraft noise sources, and time-histories of the noise. Much of this information will also be discussed at the NSAG meeting and will eventually be consolidated with data from the second phase on monitoring for use in identifying the benefits of potential mitigation measures.

orthophoto

Site 1: 11 Highview Drive, Wainscott

Site 1 was located in the backyard of a single-family home located at 11 Highview Drive in Wainscott. This site was north of the airport, approximately 3200 feet from the end of Runway 16/34 and 1000 feet west of the extended runway centerline. Figure 1 shows the location of the microphone in the backyard of this residence.

Figure 1. Microphone Location for Site 1

Site 1 was selected to document helicopter traffic patterns and operations. The site is located roughly 500 feet north of a power line that is used as a reference for helicopter pilots on approach to Runway 16.

Attended noise measurements were conducted on June 26th from 14:55 to 16:21, on June 27th from 13:45 to 16:00, on June 30th from 10:45 to 11:10, and on July 2nd from 14:20 to 17:25.

During the attended measurements, observed noise events were due to a range of fixed- and rotary-wing aircraft including helicopters, float planes, jet aircraft, single-engine piston aircraft, twin-engine piston aircraft, and other unidentified general aviation propeller aircraft. Helicopter operations accounted for 41 percent of the observed aircraft operations at this site. Non-aircraft sources that generated noise events included a trash truck that entered the property on June 27th at 14:00. Other non-aircraft sources that were audible during the attended monitoring periods included birds, wind in the trees, and gunfire from the gun club. Appendix A provides graphs of the hourly noise levels for all sites, including the following noise metrics: L_{max}, L_{eq}, L_1, L_{10}, L_{50}, and L_{90}.

The measured Total DNL ranged from 48 to 55 dBA over the 13-day period. The DNL due to measured noise events (both aircraft and non-aircraft) ranged from 44 to 55 dBA. The tables in Appendix B provide summaries of the measured DNL for all of the sites.

In general, helicopter operations generated the highest noise levels at Site 1. The measured SEL for noise events generated by observed helicopter operations ranged from 66 to 92 dBA, while the measured L_{max} for observed helicopter noise events ranged from 60 to 83 dBA.

Graphs in Appendix C show the range of the measured SEL for each of the observed aircraft types for each site. Graphs in Appendix D compare the distribution of the measured SEL for all observed aircraft events with the distribution of the measured SEL for all measured noise events at each site.

2.1 Sites 2 & 2A: 93 & 103 Merchants Path, Bridgehampton

Sites 2 and 2A were located in the yards of single-family homes located at 103 and 93 Merchants Path, respectively. These sites were situated west of the airport, approximately 5200 feet from the end of Runway 10/28 and 1700 feet south of the extended runway centerline. Figure 2 shows the location of the microphone in the front yard of the residence at 93 Merchants Path.

Figure 2. Microphone Location for Site 2A

Sites 2 and 2A were selected to obtain noise levels and document aircraft operations from Runway 10/28. Attended noise measurements were conducted on June 26th from 10:45 to 12:58, on June 26th from 16:40 to 17:04, on June 27th from 09:24 to 12:32, on July 1st from 09:45 to 12:34, on July 7th from 17:15 to 18:31, and on July 8th from 09:15 to 13:00.

During the attended measurements, observed noise events were due to a range of fixed- and rotary-wing aircraft including helicopters, float planes, jet aircraft, single-engine piston aircraft, twin-engine piston aircraft, twin-engine turbo props, and other unidentified general aviation propeller aircraft. Singe-engine pistons accounted for 49 percent of the observed aircraft operations at this site. Non-aircraft sources that generated noise events included power tools, truck pass-bys, landscaping equipment, children, and birds. Appendix A provides graphs of the hourly noise levels for all sites, including the following noise metrics: L_{max}, L_{eq}, L_1, L_{10}, L_{50}, and L_{90}.

The measured Total DNL ranged from 53 to 61 dBA over the 13-day period. The DNL due to measured noise events (both aircraft and non-aircraft) ranged from 48 to 58 dBA. The tables in Appendix B provide summaries of the measured DNL for all of the sites.

In general, jet aircraft operations generated the highest noise levels at Site 2. The measured SEL generated by observed jet aircraft operations ranged from 71 to 91 dBA, while the measured L_{max} for observed jet aircraft noise events ranged from 62 to 84 dBA.

Graphs in Appendix C show the range of the measured SEL for each of the observed aircraft types for each site. Graphs in Appendix D compare the distribution of the measured SEL for all observed aircraft events with the distribution of the measured SEL for all measured noise events at each site.

2.2 Site 3: 244 Widow Gravitts, Bridgehampton

Site 3 was located in the backyard of a single-family home located at 244 Widow Gravitts in Bridgehampton. This site was northwest of the airport, approximately 7700 feet from the end of Runway 10/28 and 3200 feet north of the extended runway centerline. Figure 3 shows the location of the microphone in the backyard of this residence.

Figure 3. Microphone Location for Site 3

Site 3 also was selected to document helicopter traffic patterns and operations. The site is located roughly 500 feet south of a power line that is used as a reference for helicopter pilots on approach to Runway 16.

Attended noise measurements were conducted on June 26th from 10:17 to 10:45, on June 26th from 16:52 to 19:04, June 27th from 16:45 to 18:48, and on July 2nd from 15:10 to 18:10.

During the attended measurements, observed noise events were due to a range of fixed- and rotary-wing aircraft including helicopters, float planes, jet aircraft, single-engine piston aircraft, and a twin-engine piston aircraft. Helicopter operations accounted for 66 percent of the observed aircraft operations at this site. Non-aircraft sources that generated noise events included dogs and geese. Appendix A provides graphs of the hourly noise levels for all sites, including the following noise metrics: L_{max}, L_{eq}, L_1, L_{10}, L_{50}, and L_{90}.

The measured Total DNL ranged from 49 to 56 dBA over the 13-day period. The DNL due to measured noise events (both aircraft and non-aircraft) ranged from 43 to 55 dBA. The tables in Appendix B provide summaries of the measured DNL for all of the sites.

In general, helicopter operations generated the highest noise levels at Site 3. The measured SEL for noise events generated by observed helicopter operations ranged from 65 to 90 dBA, while the measured L_{max} for observed helicopter noise events ranged from 57 to 82 dBA.

Graphs in Appendix C show the range of the measured SEL for each of the observed aircraft types for each site. Graphs in Appendix D compare the distribution of the measured SEL for all observed aircraft events with the distribution of the measured SEL for all measured noise events at each site.

2.3 Site 4: 75 West Gate, Wainscott

Site 4 was located in the backyard of a single-family home located at 75 West Gate in Wainscott. This site was south of the airport, approximately 1500 feet from the end of Runway 04/22 and 700 feet east of the extended runway centerline. Figure 4 shows the location of the microphone in the backyard of this residence.

Figure 4. Microphone Location for Site 4

Site 4 was selected to obtain noise levels and document aircraft operations to and from Runways 04/22 and 10/28. Attended noise measurements were conducted on June 27th from 09:45 to 12:15, on July 1st from 16:45 to 17:47, and on July 2nd from 10:50 to 12:55.

During the attended measurements, observed noise events were due to a range of fixed- and rotary-wing aircraft including helicopters, float planes, jet aircraft, single-engine piston aircraft, and twin-engine piston aircraft. Single-engine piston operations accounted for 41 percent of the observed aircraft operations at this site.

During this some of the attended measurement periods, non-aircraft sources made significant contributions to overall levels at this site. Non-aircraft sources that generated noise events included construction activity at a new home across the street from this site. Construction activity accounted for 85 percent of all observed noise events during the attended periods. Other non-aircraft sources that generated noise events during the attended monitoring periods included local street traffic, a car backing out of the driveway, and a train. Appendix A provides graphs of the hourly noise levels for all sites, including the following noise metrics: L_{max}, L_{eq}, L_1, L_{10}, L_{50}, and L_{90}.

The measured Total DNL ranged from 49 to 58 dBA over the 13-day period. The DNL due to measured noise events (both aircraft and non-aircraft) ranged from 42 to 59 dBA. The tables in Appendix B provide summaries of the measured DNL for all of the sites.

A helicopter operation generated the highest noise level at Site 4. The measured SEL for this observed noise event was 81 dBA, while the measured L_{max} for this observed noise event was 70 dBA.

Graphs in Appendix C show the range of the measured SEL for each of the observed aircraft types for each site. Graphs in Appendix D compare the distribution of the measured SEL for all observed aircraft events with the distribution of the measured SEL for all measured noise events at each site.

2.4 Site 5: Georgica Estates Tennis Courts, East Hampton

Site 5 was located near the tennis courts at Georgica Estates in East Hampton. This site was east of the airport, approximately 4700 feet from the end of Runway 10/28 and 500 feet south of the extended runway centerline. Figure 5 shows the location of the microphone in relation to the tennis courts.

Figure 5. Microphone Location for Site 5

Site 5 was selected to obtain noise levels and document aircraft operations to and from Runway 10/28. Attended noise measurements were conducted on June 26th from 15:06 to 17:34, on June 27th from 15:20 to 17:01, on July 1st from 15:40 to 19:08, and on July 8th from 11:30 to 12:37. The noise event threshold for this site was originally set at 50 dBA then, on June 26th at 17:34, the noise event threshold was changed to 55 dBA, and the monitor was moved to the location as shown in Figure 5.

During the attended measurements, observed noise events were due to a range of fixed- and rotary-wing aircraft including helicopters, float planes, jet aircraft, single-engine piston aircraft, twin-engine piston aircraft, twin-engine turbo props, a single-engine turbo prop, and other unidentified general aviation propeller aircraft. Single-engine piston operations accounted for 36 percent of the observed aircraft operations at this site. Other non-aircraft sources that generated noise events during the attended monitoring periods included local street traffic, activity at the pool, and trains. Appendix A provides graphs of the hourly noise levels for all sites, including the following noise metrics: L_{max}, L_{eq}, L_1, L_{10}, L_{50}, and L_{90}.

The measured Total DNL ranged from 55 to 61 dBA over the 12-day period. The DNL due to measured noise events (both aircraft and non-aircraft) ranged from 51 to 60 dBA. The tables in Appendix B provide summaries of the measured DNL for all of the sites.

In general, jet aircraft operations generated the highest noise levels at Site 5. The measured SEL for observed jet aircraft operations ranged from 68 to 96 dBA, while the measured L_{max} for observed jet aircraft ranged from 57 to 89 dBA.

Graphs in Appendix C show the range of the measured SEL for each of the observed aircraft types for each site. Graphs in Appendix D compare the distribution of the measured SEL for all observed aircraft events with the distribution of the measured SEL for all measured noise events at each site.

2.5 Site 6: Ross School Athletic Fields, Wainscott

Site 6 was located near the athletic fields at the Ross School in Wainscott. This site was north of the airport, approximately 2000 feet from the end of Runway 04/22 and 600 feet east of the extended runway centerline. Figure 6 shows the location of the microphone in relation to the athletic fields.

Figure 6. Microphone Location for Site 6

Site 6 was selected to obtain noise levels and document aircraft operations to and from Runways 04/22 and 16/34. Attended noise measurements were conducted on June 26th from 14:50 to 15:49, on June 27th from 14:00 to 14:52, and on July 1st from 10:00 to 12:34.

During the attended measurements, observed noise events were due to a range of fixed- and rotary-wing aircraft including helicopters, float planes, jet aircraft, single-engine piston aircraft, twin-engine piston aircraft, and other unidentified general aviation propeller aircraft. Total propeller aircraft operations (including single-engine piston, twin-engine piston, and other general aviation propeller aircraft) accounted for 68 percent of the observed aircraft operations at this site.

The only non-aircraft source that generated a noise event during the attended monitoring period was a tractor on the athletic fields. Appendix A provides graphs of the hourly noise levels for all sites, including the following noise metrics: L_{max}, L_{eq}, L_1, L_{10}, L_{50}, and L_{90}.

The measured Total DNL ranged from 49 to 56 dBA over the 7-day period. The DNL due to measured noise events (both aircraft and non-aircraft) ranged from 38 to 55 dBA. The tables in Appendix B provide summaries of the measured DNL for all of the sites.

In general, jet aircraft operations generated the highest noise levels at Site 6. The measured SEL for observed jet aircraft operations ranged from 71 to 81 dBA, while the measured L_{max} for observed jet aircraft ranged from 57 to 69 dBA.

Graphs in Appendix C show the range of the measured SEL for each of the observed aircraft types for each site. Graphs in Appendix D compare the distribution of the measured SEL for all observed aircraft events with the distribution of the measured SEL for all measured noise events at each site.

2.6 Site 7: 136 Main Street, East Hampton Village

Site 7 was located in the backyard of a single-family home at 136 Main Street in East Hampton Village. This site was east of the airport, approximately 15000 feet from the end of Runway 10/28 and 500 feet south of the extended runway centerline. Figure 7 shows the location of the microphone in relation to the house.

Figure 7. Microphone Location for Site 7

Site 7 was selected to obtain noise levels and document aircraft operations for Runway 10/28. Attended noise measurements were conducted on July 2nd from 09:59 to 12:00, and on July 8th from 09:50 to 10:52.

During the attended measurements on July 2nd, three aircraft were observed on approach to Runway 28; however, the noise event data for these operations were contaminated by landscaping activities in the area. The three observed aircraft included a float plane, a jet aircraft, and a twin engine turbo prop.

During this measurement period, non-aircraft sources that contributed to the noise environment at this site included landscaping equipment and local street traffic. Appendix A provides graphs of the hourly noise levels for all sites, including the following noise metrics: L_{max}, L_{eq}, L_1, L_{10}, L_{50}, and L_{90}.

The measured Total DNL ranged from 53 to 60 dBA over the 7-day period. The DNL due to measured noise events (both aircraft and non-aircraft) ranged from 41 to 59 dBA. The tables in Appendix B provide summaries of the measured DNL for all of the sites.

Graphs in Appendix C show the range of the measured SEL for each of the observed aircraft types for each site. Graphs in Appendix D compare the distribution of the measured SEL for all observed aircraft events with the distribution of the measured SEL for all measured noise events at each site.

3. THE NEXT STEPS IN THE STUDY

Following the September 9th meeting of the NSAG, HMMH will review the committee's comments and proceed to finalize our analysis of both phases of monitoring. In addition, HMMH will:

- Summarize operational data to be used in subsequent noise modeling analyses
- Develop inputs to the FAA's Integrated Noise Model (INM) and produce a base case description of the noise environment around the airport, including single-event and cumulative 24-hour noise exposure contours
- Compare measurements of the noise to modeled results of the base case
- Prepare a preliminary list of potential mitigation measures for the NSAG's consideration