

MINASKUAT PROJECT NO. M39
SUPERSONIC NOISE DISTURBANCE
AND WATERFOWL BEHAVIOR

NOVEMBER 19, 2003



MINASKUAT PROJECT NO. M39

FINAL REPORT

SUPERSONIC NOISE DISTURBANCE AND WATERFOWL BEHAVIOR

PREPARED FOR

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1.0 INTRODUCTION

Allied air forces conducting low level flight training at 5 Wing Goose Bay have indicated the need to expand current activities to meet changing operational requirements. In response, the Department of National Defence (DND) proposed to conduct limited supersonic flight trials during August 2003. The trial was to involve one CF-18 fighter aircraft from 3-Wing Bagotville and a study team on the ground, supported by Minaskuat (a partnership created between Innu Environmental and Jacques Whitford). The DND planned to collect noise information to validate a computer program, produced for the United States Air Force, designed to predict and model the intensity and size of a sonic boom resulting from supersonic flight. The intent of this program (PC-Boom) was to support the environmental assessment of the possible effects of introducing supersonic training for Allied forces in the Low-level Training Area (LLTA).

The Institute for Environmental Monitoring and Research (IEMR) expressed interest in the proposed trials of DND, leading to the development of a separate, concurrent study designed to collect information on waterfowl behavior during supersonic noise events. This information would be considered exploratory in nature and serve as a basis for structuring future research by the IEMR on supersonic flight training at 5 Wing Goose Bay. Minaskuat was also contracted to complete this investigation. As this work was unfortunately cancelled in 2003, the following status report is intended to serve as background for future consideration once the trials are re-scheduled.

1.1 Objective

The objective of this research was to collect preliminary field observations of waterfowl and their response to sonic booms from CF-18 noise events. The investigation was to focus on behavioural response during and following these events as well as other observations that could be used for future and more rigorous testing.

1.2 Study Team

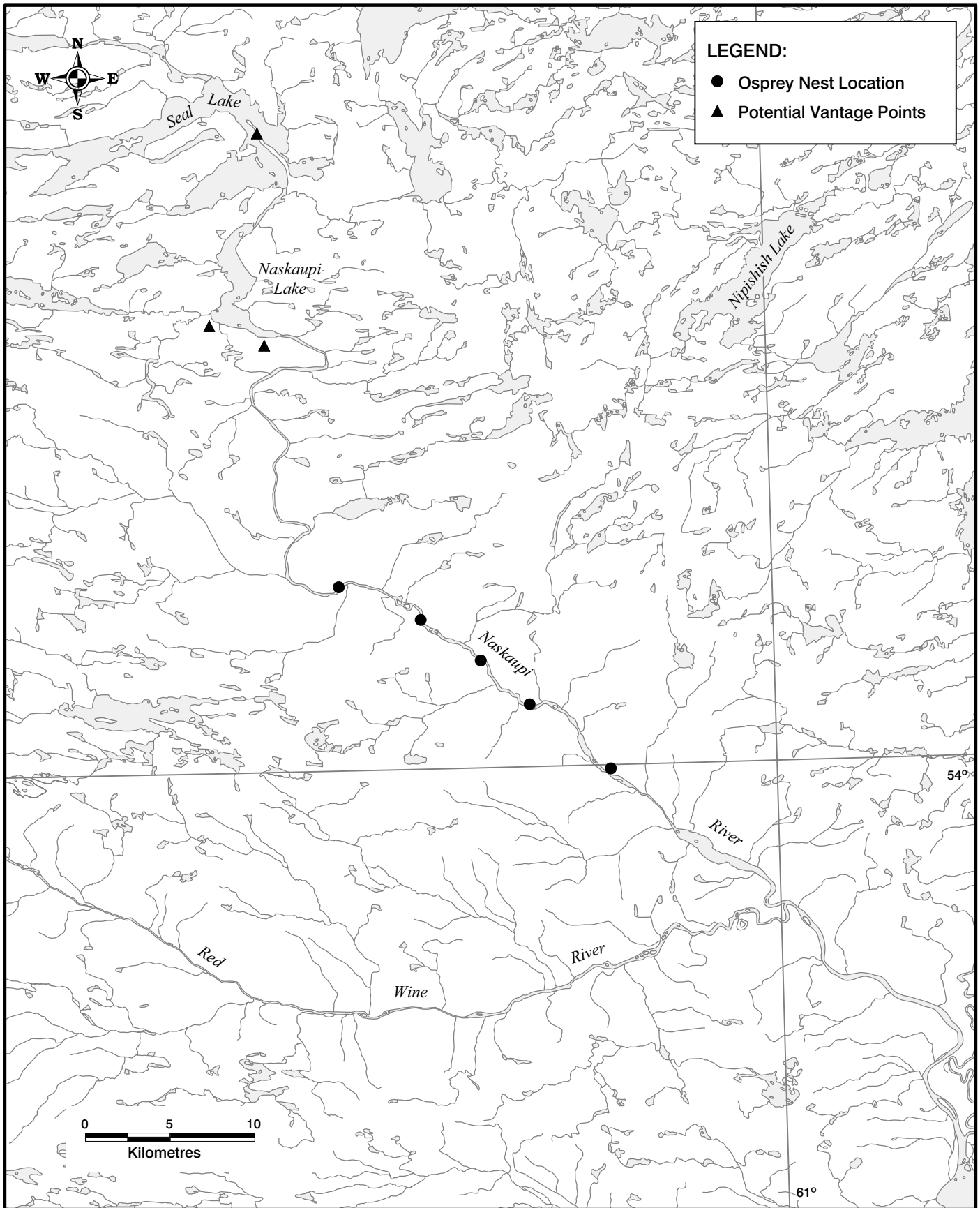
Mr. Perry Trimper (Jacques Whitford) was the project manager for this study and responsible for quality control. Aboriginal and non-aboriginal field observers were to include Mr. Trimper, Ms. Kathy Knox and Mr. David Lemon (Jacques Whitford), Ms. Tina Newbury (MSc. candidate, sub-consultant), Mr. Max Penashue (Dee Max Innu Tautshaup Ltd., sub-consultant), Mr. Bill Barrow (Canadian Wildlife Service (retired), sub-consultant), Mr. Jean Huot (IEMR/University of Laval), Mr. Tony Parr (IEMR), and Ms. Karen Gosse, Ms. MaryAnn Aylward and Ms. Shirley Hill (Minaskuat). Several DND personnel and support persons were also involved in various aspects of the program. Data sheets were developed by Mr. Corey Cooney (Minaskuat), Mr. Trimper, and Ms. Newbury. Ms. Caroline Hong (Minaskuat) coordinated logistical support for the field program.



1.3 Study Area

The study area lies within the 130,000km² LLTA of Labrador and northeastern Quebec, and approximately 100 kilometers northwest of Happy Valley-Goose Bay (Figure 1). Waterfowl observation locations were selected in areas where waterfowl were abundant and where observers could easily view the birds with minimal disturbance. Observation stations (blinds) were identified at three locations within this area near the north and south outlets of Naskaupi Lake (“Cliff” (54°13.499’N – 61°26.968’W) and “Rock” (54°14.721’N –61°29.734’W) stations, respectively) and along an esker at Seal Lake (“Esker” station, 54°19.372’N -61°26.135’W).





NFS09286-ES-03.WOR 09SEPT03 1:30PM



FIGURE 1
ACTIVE OSPREY NESTS - NASKAUPI RIVER
AND POTENTIAL WATERFOWL OBSERVATION POINTS
2003

2.0 METHODOLOGY

2.1 Logistics

A detailed protocol and schedule were developed in consultation with DND and the helicopter provider (Universal Helicopters Newfoundland Ltd. (UHNL)) (Appendix A). Staff, including back-up personnel, was confirmed for availability. Logistics (helicopter transport of field observers and camp set up) were confirmed and equipment lists were prepared for each observation site (Appendices B and C). Field health and safety issues (i.e., potential hazards including high noise levels) and the use of personal protective equipment was discussed in advance of supersonic trials. Ear protectors were considered mandatory and would be provided to each participant courtesy of UHNL. Other protective equipment (bear/bug spray, bear bangers, first aid kits) were purchased for use by the study team. A form indicating that each participant was aware of the health risks and would comply with safety procedures was also prepared for signature (Appendix D). In addition, a satellite phone was issued to each study team/observation location (Appendix B). Mr. Cooney, Mr. Trimper and Ms. Newbury developed the methodology and datasheets (Appendix E). Data sheets, contact numbers and instructions were prepared in three separate binders for each of the sites.

Cabins in the area of the proposed supersonic trials were videotaped on 7 August to document pre- and post-experimental condition. In addition, aerial surveys were conducted in the vicinity of each blind to confirm the presence of waterfowl [Note that waterfowl, predominantly Canada Goose (*Branta canadensis*) and Black Duck (*Anas rubripes*), were in abundance immediately adjacent to the viewing locations]. In concert with the other pre-experimental preparations, some of the field equipment was prepared in advance for placement at designated observation locations during cabin and waterfowl surveys.

2.2 Waterfowl Observations

Preliminary field observations were scheduled to occur 8 August between 0530-0700 hrs at each study location. Access would be provided by helicopter the evening prior on 7 August and a temporary camp established. Using spotting scopes, binoculars and 20x video cameras, the 2-3 person teams would perform individual scanning of waterfowl within respective fields of view and record the time of day, weather conditions, species, sex, number, and location for each observation. Consistent with research by IEMR at Lac Fourmont during Spring 2002, each 5-minute scan of an individual waterfowl (randomly selected considering species and sex) would describe various activities: feeding, resting, alert, flight, diving, vocalization, and swimming.



Supersonic trials were planned for 10 August between 0700-1000 hrs, access was to occur the evening prior on 9 August. Waterfowl observations would be similar to those during preliminary field observations described above, except that additional information on the noise events and subsequent immediate and other reactions would be noted. Larsen Davis hand-held sound meters were assigned to study teams to record L_{\max} dB levels. Specialized equipment used to measure overpressures and other noise energy parameters was to be deployed by a DND consultant (Urban Aerodynamics Ltd.) at an adjacent area (the Naskaupi River). Through the use of satellite telephones, each team would be in contact with the Military Coordination Centre (MCC) at the start and end of each series of supersonic events. The aircraft pilot would fly a series of pre-determined patterns at altitudes from 5,000 to 10,000 feet, in an area measuring 90 km by 115 km encompassing the study area and at speeds exceeding supersonic (during directed circuits). In addition to recording observations on data sheets, observations of the supersonic tests would also be recorded using digital video cameras with 20x optical zoom.

Post-Treatment observations were scheduled between 15-16 August and would follow similar protocols as during preliminary observations. In addition to behavior, possible displacement of birds as a result of supersonic trials (scheduled for 11-14 August) would be recorded.



3.0 OUTCOME

During field preparation on 7 August, three forest fires in the study area had increased significantly towards the observation blinds. Extensive smoke was observed within the Red Wine River and Naskaupi River Valleys as well Seal Lake making low altitude helicopter travel unsafe. A surveillance of the surrounding area indicated there were two large fires burning, both approximately 5 km west of the blinds (at Red Wine River and northwest of Seal Lake). With the prevailing winds (West and North West), the proposed study area was engulfed in smoke.

On return from the study area, Minaskuat personnel attended a detailed briefing regarding weather and fire with Provincial Forestry staff. As the fires in the study area were not burning near private property or merchantable timber, the Provincial Forestry indicated that they would monitor the fire status but would not expend any effort to fight these fires. Minaskuat delayed the start of the preliminary field observations until the extent of the fires could be better assessed.

On the morning of 8 August, fire monitoring crews informed Minaskuat that the study area contained 10 fires, with several fires now closer (<3 km) to the planned observation points. With no significant rain in the forecast for more than 5 days, the Base Commander and DND representatives (Goose Bay office) met to review the situation and possibility of precipitation in the forecast. Given that the CF-18 aircraft was available only until 15 August, there was a possibility that only 1-2 days were available (if any) for the trials. Furthermore, given the human safety issues and the possible influence of smoke on the behavior of waterfowl in the study area, the Goose Bay office, DND, cancelled the program by noon that same day. The IEMR (Ms. Maureen Baker) was contacted immediately by Mr. Trimper who issued a 'stop work' order to all parties involved.



4.0 CONCLUDING STATEMENT

From the perspective of Minaskuat and the logistics of completing the field investigations under extreme conditions associated with proximate forest fires, there is no doubt that the supersonic trials had to be cancelled. While Minaskuat is aware of other issues related to the authorization to proceed with the supersonic trials, it is considered beyond the scope of this assignment to comment.

It should be noted however, that should the program be re-scheduled, the background materials and setting for the trials could be readily implemented.



APPENDIX A

Supersonic field schedule, 6-16 August 2003

Supersonic Field Schedule

06.08.03 - Wednesday

Afternoon -3h total Helicopter to Naskaupi area lodges to video record site and tape windows - CC/PT

07.08.03 – Thursday

13:30h BB arrives, picks up rented car (National) and drives to Minaskuat office
GH arrives, has rental car

10.08.03 – Sunday

F18 Pilot, VS arrive - GH to pick up
Call Forestry at 497-8479 to advise field crews being deployed

18:00h WF¹ Meet at Universal Helicopters (BB, JH, KG, MA, PT, TP), bring field gear and breakfast
food

18:00h WF PT to meet F18 Pilot at MCC

18:45h WF 1st crew departs UHNL (JH, KG, MA, PT, TP)

20:00h WF 2nd crew departs NWR (BB, MP, TN)

21:15h WF 3rd crew departs UHNL (remaining)

19:10h WF DL arrives- CH to pick up

20:05h WF KK arrives - CH to pick up

Evening WF Prepare campsite

11.08.03 – Monday

05:30h WF Set-up and preparation for data collection

06:45h WF Jet departs YYR, enroute to study area

¹ Waterfowl

07:00-08:00h WF Jet performs 1st set of super sonic passes. Following this trial, PT will communicate with each team member and then to MCC/others

09:00-10:00h WF Jet performs 2nd set of super sonic passes. Following this trial, PT will communicate with each team member and then to MCC/others

11:30h WF Pick-up of 1st crew and return to YYR (MA to be included on this trip)
Pick-up of 2nd crew and return to YYR

13:30h WF NS arrives, GH to pick-up

14:00h WF Meet at Minaskuat Office for debrief and download of data (notes, video, audio)

15:00h WF MA departs for Voisey's Bay

Evening OSP² Pick up lunches for osprey observers - CH

12.08.03 – Tuesday

07:00h OSP Meet at UHNL (with gear and lunches) for departure to nest blinds - BB, BR, CC, DL, GG, GH, KK, NS, PT, SH/or KG - 2 helicopters to drop off crews, only GG to remain with crew

9:00h onward OSP Multiple sorties by Jet for super sonic passes. Following each pass, each team member is to contact NS at Site #5. He will in turn contact Pilot, VS/others

17:00h-18:00h OSP Return of Osprey group to YYR
OSP Pick up lunches for osprey observers - CH

18:00h BBQ at 8 Mealey Mountain Rd. for project team (BB, BR, DL, GG, GH, KG, KK, MP, NS, TN, VS, pilot, others)

13.08.03 – Wednesday

06:45h OSP Meet at UHNL (with gear and lunches) for departure to nest blinds - BR, CC, CH, DL, GG, GH, KG, KK, NS, PT - 2 helicopters to drop off crews, only GG to remain with crew

07:00h OSP Osprey group - 1st crew departs UHNL
OSP Osprey group - 2nd crew departs UHNL

TBA OSP Multiple sorties by Jet for super sonic passes. Following each pass, each team member is to contact NS at Site #5. He will in turn contact Pilot, VS/others

13:45h B. Barrow departs YYR for YHZ

16:00h OSP Pick-up of 1st crew and return to YYR
Pick-up of 2nd crew and return to YYR

Evening OSP Pick up lunches for osprey observers - CH

14.08.03 – Thursday

06:45h OSP Meet at UHNL (with gear and lunches) for departure to nest blinds - BR, CC, CH, DL, GG, GH, KG, KK, NS, PT - 2 helicopters to drop off crews, only GG to remain with crew

07:00h OSP Osprey group - 1st crew departs UHNL
Osprey group - 2nd crew departs UHNL

TBA OSP Multiple sorties by Jet for super sonic passes. Following each pass, each team member is to contact NS at Site #5. He will in turn contact Pilot, VS/others

16:00h OSP Pick-up of 1st crew and return to YYR
Pick-up of 2nd crew and return to YYR

Evening OSP Pick up lunches for osprey observers - CH

15.08.03 – Friday

06:45h OSP Meet at UHNL (with gear and lunches) for departure to nest blinds - BR, CC, CH, DL, GG, GH, KG, KK, NS, PT- 2 helicopters to drop off crews, only GG to remain with crew

07:00h OSP Osprey group - 1st crew departs UHNL
Osprey group - 2nd crew departs UHNL

TBA OSP Multiple sorties by Jet for super sonic passes. Following each pass, each team member is to contact N. Standen at Site #5. He will in turn contact Pilot, Vijay/others

16:00h OSP Pick-up of 1st crew and return to YYR
Pick-up of 2nd crew and return to YYR

16:00h WF Meet at Universal Helicopters, bring field gear and breakfast food (DL, KG, MP, PT, TN, TP)

18:30h WF Waterfowl group - 1st crew departs UHNL
20:00h WF Waterfowl group - 2nd crew departs UHNL
Evening WF Prepare campsite
14:00h WF Meet at Minaskuat Office for Debrief and download of data (notes,
video, audio)

16.08.03/17.08.03/18.08.03 GH, NS, VS, DL depart

BB= Bill Barrow, BR=Bruce Rodriguez, CC=Corey Cooney, CH=Caroline Hong, DL=Dave Lemon, GG=Geoff Goodyear, GH=Gary Humphries, JH=Jean Huot, KG=Karen Gosse, KK=Kathy Knox, MA= Mary Ann Aylward, MP=Max Penashue, NS=Neil Standen, PT=Perry Trimper, SH=Shirley Hill, TP=Tony Parr and VS=Vijay Singh (not the golfer)

APPENDIX B

Field Observation Locations, Team Members and Contact Numbers

**Supersonic Testing Program - Waterfowl
Institute for Environmental Monitoring and Research**

Esker Blind (Seal Lake)	
Coordinates	54 19 372 61 26 135
Team Members	Tina Newbury Mary Ann Aylward Tony Parr
Satellite Phone#	(613) 988-2424

Cliff Blind (Naskaupi Lake)	
Coordinates	54 13 499 61 26 968
Team Members	Perry Trimper Max Penashue Vijay Singh
Satellite Phone#	(613) 988-2951

Rock Blind (Naskaupi Lake)	
Coordinates	54 14 721 61 29 734
Team Members	Bill Barrow Karen Gosse
Satellite Phone#	(613) 988-8333

Cabin Coordinates	
Seal Lake Cabin	54 19 417 61 37 778
Naskaupi Lake Cabin	54 13 816 61 26 650
Naskaupi River Cabin	53 56 336 61 00 506

APPENDIX C

Field Equipment List

Supersonic Field Equipment Supply List, August 2003

Equipment	Esker	Rock	Cliff
Data sheets			
Contact list			
Protocol			
Pencils			
Satellite phone			
Thermometer + extra batteries			
Video camera + extra batteries			
Video cassettes			
Video cam. Tripod			
Scope + tripod			
Binoculars			
Sound meter			
Ear protectors			
Chairs x2/3			
Blinds			
Stop watches			
Tent (s)			
Sleeping bags 2-3			
Sleeping mattress 2-3			
Flashlight			
water			
Food/cooler			
Bear bangers			
Bear spray			
Fly jacket			
Bug spray			
Mosquito coils			
First aid kit			
Matches			
Knife			
Rope			
Duct tape			

APPENDIX D

Safety Compliance Form

**Minaskuat
Jacques Whitford Group
Happy Valley-Goose Bay, NL**

Record of Occupational Health & Safety Indoctrination for the Naskaupi Supersonic Trial

I _____, the undersigned Minaskuat (Jacques Whitford Group) employee/ or Minaskuat subcontractor was given an Occupational Health & Safety indoctrination on the noted date. In this OH&S indoctrination, I was made aware of the following:

1. the Jacques Whitford Group's OH&S policy;
2. the Newfoundland and Labrador Safety Management System & Accident Prevention Plan; relevant sections of the manual were highlighted (e.g., safe work practices, personal protective equipment);
3. an employees legislated right to refuse to do unsafe work;
4. the procedure for job site safety inspections;
5. requirement for employees to report all accidents and incidents;

It was explained that Personal Protective Equipment (e.g. ear defenders, bug jackets and/or bug spray) and equipment for overnighting will be provided to me for my use in the field, if I do not have access to personally owned equipment. The nature of this work and potential hazards have been explained to me and I understand that ear defenders must be worn through out this component of this field program.

Employee Name (Print): -----

Employee Signature: -----

Date: -----

OH&S Indoctrination Trainer: -----

APPENDIX E

Waterfowl Observation and Weather Log Data Sheets

Supersonic Testing Program – Waterfowl

Institute for Environmental Monitoring and Research

Weather Log

Date	
Time	
Location	
Air Temperature	
Wind Speed / Direction	
Cloud Cover	

Note: Record at start and 1 hour increments thereafter.