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Ms. Jolie Harrison
Permits and Conservation Division
Office of Protected Resources
National Marine Fisheries Service (NMFS)
1315 East West Highway
Silver Spring MD 20910

RE: Coastal Virginia Offshore Wind (CVOW) Project 2018 Unexploded Ordnance (UXO) Investigation Survey Protected Species Observer (PSO) Report

Dear Ms. Harrison,

Dominion Energy (Dominion) is pleased to submit the attached 2018 Unexploded Ordnance (UXO) Investigation Survey (UXO Survey) Final Protected Species Observer Report (PSO Report). On July 31, 2018, National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS) issued an Incidental Harassment Authorization (IHA) allowing for the incidental harassment of small numbers of marine mammals resulting from the execution of a UXO Survey off the coast of Virginia in the area of the Research Lease of Submerged Lands for Renewable Energy Development on the Outer Continental Shelf (OCS-A 0497). Dominion conducted the UXO Survey between August 9 and October 23, 2018. This PSO report is being submitted in compliance with Condition 6 of the IHA, which requires that Dominion submit a PSO Report to NMFS within 90 days of completion of survey activities. The PSO Report documents the methods and monitoring protocols utilized during the UXO Survey, provides a summary of the monitoring data, as well as an estimate of marine mammals that may have been taken during survey activities, the effectiveness of mitigation measures and an interpretation of the results and effectiveness of all monitoring tasks.

If you have any question of concerns regarding the attached PSO Report, please do not hesitate to contact Scott Lawton at Scott.Lawton@dominionenergy.com or (804) 273-2600.

Sincerely,

A handwritten signature in black ink that reads "Jason Williams".

Jason E. Williams
Director Environmental Services
Dominion Energy

cc: Mandy Tornabene, Dominion
Scott Lawton, Dominion
Mark Mitchell, Dominion
David Leaf, Dominion
Al Christopher, Virginia DMME
Casey Reeves, BOEM

Attachment



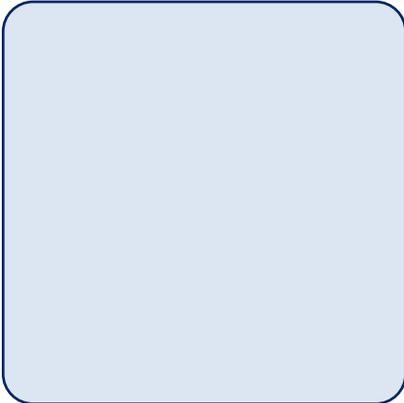
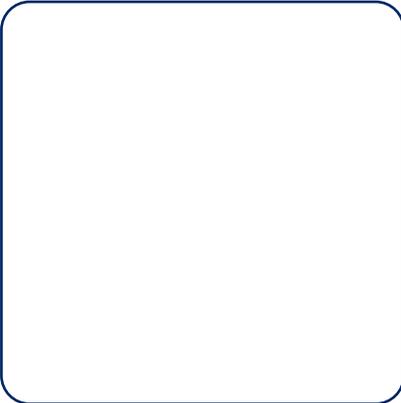
Protected Species Observer Report

Prepared for: TerraSond

On behalf of Ørsted and Dominion Energy, Virginia

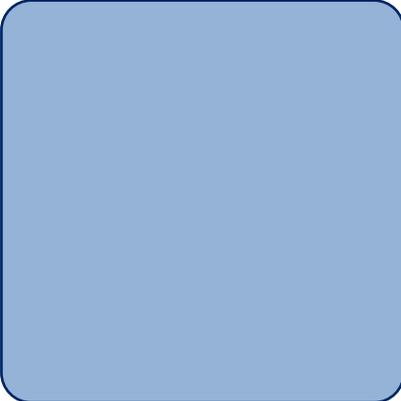
Dominion Energy, Virginia
BOEM Lease No.: OCS-A 0497
Virginia, U.S.A

09 August to 23 October 2018



Final Report

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Executive Summary

The report covers the protected species mitigation and monitoring efforts aboard the *Gerry Bordelon* vessel from 09 August through 23 October 2018. This is the final report for the Coastal Virginia Offshore Wind (CVOW) Unexploded Ordnance (UXO) / Discarded Military Munitions (DMM) Investigation Survey (Survey) which was conducted within federal waters off the coast of Virginia Beach, Virginia. The CVOW UXM/DMM Investigation Survey Plan (Survey Plan) was developed on behalf of Dominion Energy, Virginia, by Ørsted, the offshore engineering, procurement and construction contractor for the project. High resolution bathymetry and geophysical survey data acquisition was conducted by Terrasond within the parameters defined in the UXM/DMM Investigation Survey Plan. These survey parameters utilized a single survey vessel (M/V *Gerry Bordelon*) to complete data acquisition within a 492 foot (150 meter) wide corridor, along an export cable corridor, around two proposed offshore wind turbine installation sites, and along the inter-array cable route that will connect the two turbines of the CVOW Project. Protected species monitoring was conducted in accordance with Bureau of Ocean Energy Management (BOEM) and National Marine Fisheries Service (NMFS) standards, as well as Research Activities Plan (RAP) Approval Conditions for Lease Outer Continental Shelf (OCS)-A 0497 and an Incidental Harassment Authorization (IHA) issued for the survey program.

The Survey was conducted using a towed 4-magnetometer array, a shallow-penetration Innomar sub-bottom profiler, a dual-head multi-beam echo sounder, towed sidescan sonar, and Ultra Short Baseline (USBL) sub-surface positioning sonar. Protected species mitigation measures, as specified in the IHA issued by NMFS were required for all devices transmitting below frequencies of 200 kHz; specifically, included the Innomar sub-bottom profiler and the USBL.

Four protected species observers (PSOs) and two Passive Acoustic Monitoring (PAM) Operators, provided by RPS, were on board the *Gerry Bordelon* to undertake visual and acoustic observations and implement mitigation protocols in accordance with Lease OCS-A 0497, IHA protected species mitigation protocols and RAP Approval Conditions for the CVOW survey. Mitigation protocols for this survey included establishment of exclusion zones (EZ) for marine mammals and other protected species including sea turtles and Atlantic sturgeon, visual and acoustic monitoring, and strike avoidance mitigation measures.

The high resolution geophysical (HRG) survey equipment was active for a total of 904 hours and 40 minutes over the course of the survey.

Visual observations were conducted by PSOs for a total of 1235 hours and 35 minutes. Acoustic monitoring by PAM operators was conducted for 429 hours and 47 minutes during darkness and periods of low visibility during the project.

There was a total of 192 detections of marine mammals and sea turtles made visually by PSOs and/or acoustically by PAM Operators during the Survey. Visual detections of marine mammals consisted of bottlenose dolphins, Atlantic spotted dolphins, melon-headed whales and unidentified delphinids. Acoustic detections consisted of delphinids. There were also visual sightings of loggerhead sea turtles, leatherback sea turtles, unidentified shelled sea turtles and a green sea turtle. A detailed description of these detections can be found in Section 4.1 and Section 4.2.

In accordance with the IHA protected species mitigation protocols, stipulations set forth in BOEM Lease OCS-A 0497, and RAP Approval Conditions, a total of 109 mitigation actions were implemented including both delays to the initiation of source activities and shut-down of source operations. There were no potential non-compliance issues noted. Mitigation measures for sea turtles included shutting down the

acoustic source if the individual was observed approaching, entering or within the predicted 200-meter exclusion zone. Please see Section 5 for a detailed account of these mitigation actions.

NMFS issued an IHA authorizing Level B takes for marine mammals for the survey for a total of 1,627 individual marine mammals from eight different species (five dolphin species, two seal species and the harbour porpoise).

During acoustic source operations, no marine mammals were observed within the predicted radius at which there is a potential for auditory injury (based upon each species hearing range and how that overlaps with the frequencies produced by the sound source), constituting potential Level A takes. A total of 35 marine mammals, bottlenose dolphins only, were observed within the predicted 160 decibel radius (where there is a potential for a behavioural response), constituting potential Level B takes.

1 TABLE OF CONTENTS

Executive Summary.....ii

List of Figuresv

List of Tablesv

1 Introduction 7

 1.1 Project Overview and Location 7

 1.2 Vessel and Energy Sources Specifications..... 10

2 Mitigation and Monitoring Methods..... 12

 2.1 Mitigation Methodology 12

 2.2 Visual Monitoring Survey Methodology 13

 2.3 Passive Acoustic Monitoring Survey Methodology 14

 2.3.1 Passive Acoustic Monitoring Parameters 15

 2.3.2 Hydrophone Deployment 17

3 Survey Operations and Monitoring Effort..... 19

 3.1 Survey Operations Summary 19

 3.1.1 General Survey Parameters 19

 3.1.2 HRG survey equipment operations..... 19

 3.2 Visual Monitoring Survey Summary..... 20

 3.3 Acoustic Monitoring Summary 21

 3.4 Environmental Conditions 21

4 Protected Species Detection Results..... 23

 4.1 Marine Mammal Detection Summary 24

 4.1.1 Bottlenose dolphin..... 27

 4.1.2 Atlantic spotted dolphin 27

 4.1.3 Melon-headed whale 27

 4.1.4 Unidentified dolphin 27

 4.2 Visual Sea Turtle Detections 27

 4.2.1 Leatherback sea turtle 29

 4.2.2 Loggerhead sea turtle 29

 4.2.3 Green sea turtle 29

 4.2.4 Unidentifiable shelled sea turtle..... 29

 4.3 Acoustic Detections 29

5 Mitigation Actions Summary 31

 5.1 Marine Mammals Known to have been Exposed to 160dB or Greater of Received Sound Levels
 32

 5.2 Implementation and Effectiveness of Mitigation Protocols 34

List of Figures

Figure 1: General location of the CVOW survey and survey blocks.....	9
Figure 2: The survey vessel <i>Gerry Bordelon</i>	10
Figure 3: Upper view of the Gerry Bordelon with average towing gear location.....	11
Figure 4: Simplified pathway of data through the PAM system on board the Gerry Bordelon.	16
Figure 5: Diagram of hydrophone element separation and location of added weight on 250m hydrophone cable.....	16
Figure 6: Number of detection events by species group during the survey program	23
Figure 7: Detection method of marine mammal detection events during survey	25
Figure 8: Location of marine mammal detection events shown overlaid with the survey blocks	26
Figure 9: Location of sea turtle detection events shown overlaid with the survey blocks	28

List of Tables

Table 1: Acquisition Parameters Summary Table	11
Table 2: Transits during CVOW 2018	19
Table 3: Acoustic Source Operations during CVOW	20
Table 4. Total Visual Monitoring Effort during the CVOW Survey Program	20
Table 5. Total Acoustic Monitoring Effort during the CVOW Survey Program	21
Table 6: Summary of Visibility during Visual Monitoring.....	22
Table 7: Summary of Beaufort Sea state during Visual Monitoring	22
Table 8: Summary of Swell Height during Visual Monitoring	22
Table 9: Number of Detection Records Collected for each Protected Species during the survey program	23
Table 10: Average Closest Approach of Protected Species to the Acoustic Source during the Survey Program.....	24
Table 11: Detection rate of marine mammal detections for visual and acoustic monitoring during the survey program	25
Table 12: Summary of acoustic detections occurring during the survey program.....	30
Table 13: Number and Duration of Mitigation Actions Implemented during the Survey Program	31
Table 14: Mitigation Actions and Downtime Duration by Species during the Survey Program	31
Table 15. Number of Authorized and Potential Level A and B Harassment Takes During the Virginia UXO HRG program	32

Table 16: Behaviour of Species Visually Observed inside the Predicted Areas of Sound Pressure Levels of 160 dB or Greater 33

Appendices

- Appendix A: Incidental Harassment Authorization
- Appendix B: Reticle Binocular Calibration Table
- Appendix C: Night Monitoring Equipment Specifications
- Appendix D: Passive Acoustic Monitoring System Specifications
- Appendix E: PAM Hydrophone Deployment Configuration
- Appendix F: Summary of Visual Detections
- Appendix G: Summary of Acoustic Detections
- Appendix H: Photographs of Identified Protected Species
- Appendix I: Screenshots of Acoustic Detection of Protected Species
- Appendix J: Summary of Mitigation Actions

1 Introduction

The following report details protected species monitoring and mitigation as well as HRG survey operations undertaken as part of an Unexploded Ordnance (UXO)/Discarded Military Munitions (DMM) Investigation Survey (Survey) performed by TerraSond using the vessel *Gerry Bordelon* in state and federal waters offshore Virginia Beach, Virginia, USA within Lease No. Outer Continental Shelf (OCS)-A-0497) from 09 August 2018 through 23 October 2018.

The objective of this survey was to acquire data about the potential presence of UXO/DMM within the proposed construction and operational footprints of the CVOW Project Area (i.e., export cable construction corridor, inter-array cable area, and wind turbine positions) as required by RAP Approval Conditions.

This document serves to meet the reporting requirements dictated in the IHA issued to Dominion by NMFS on 31 July 2018. The IHA authorized “takes” of Level A and Level B harassment of specific marine mammals’ incidental to the survey program. NMFS has stated that seismic source received sound levels equal to or greater than 160 dB re 1 μ Pa (root mean square (rms)) could potentially disturb marine mammals, temporarily disrupting behavior, such that they could be considered non-lethal ‘takes’ (Level B harassment). In July 2016, NMFS released new technical guidance for assessing the effects of anthropogenic sound on marine mammal hearing, which established new thresholds for permanent threshold shift (PTS) onset or Level A harassment (auditory injury) for marine mammal species. Predicted distances to Level A harassment vary based on marine mammal hearing groups – low frequency cetaceans, mid frequency cetaceans, high frequency cetaceans, phocid pinnipeds and otariid pinnipeds – and how each group’s hearing range overlaps with the frequencies produced by the sound source. For sea turtles, per the Endangered Species Act (ESA), NMFS has stated that received sound levels equal to or greater than 175 dB re 1 μ Pa rms represents the current best understanding of the threshold at which they exhibit behavioral responses, and that received sound levels equal to or greater than 195 dB re 1 μ Pa rms represents the current best understanding of the threshold at which they experience PTS.

NMFS requires that provisions such as exclusion zones (EZ), delayed operations, ramp-ups, power-downs and shut-downs be implemented to mitigate for potentially adverse effects of the acoustic source sounds on protected species.

1.1 Project Overview and Location

The *Gerry Bordelon* began data acquisition on the Survey on 09 August 2018. Over the course of the survey, the *Gerry Bordelon* returned to port in Norfolk, Virginia on several occasions, each of which are documented in Section 3.1.1 of this report.

The Survey concluded on 23 October 2018 at which time the vessel returned to Norfolk, VA for project demobilization.

The Survey area was located between one and 43 kilometers east of Virginia Beach, Virginia in approximately seven to 27 meters of water. The cable export route is contained within both Federal and VA state waters. The survey consisted of 919 survey lines in ten survey blocks, which were acquired primarily in a West to East and Southwest to Northeast direction (Figure 1). Line spacing for acquisition on all systems was five meters in a corridor that varied in width: 300 meters wide nearshore from Area 1, 150 meters from Area 2 through 10 and over 450 meters wide in the turbine area of Area 10. The cable

export route was broken into two survey areas to provide for acquisition of the cable corridor without collecting data on any significant turns.

The two survey areas were divided into ten survey blocks to align with the general direction of the survey lines in the area while minimizing curves and turns. Operations took place within an area of 43 kilometers by 300 meters.

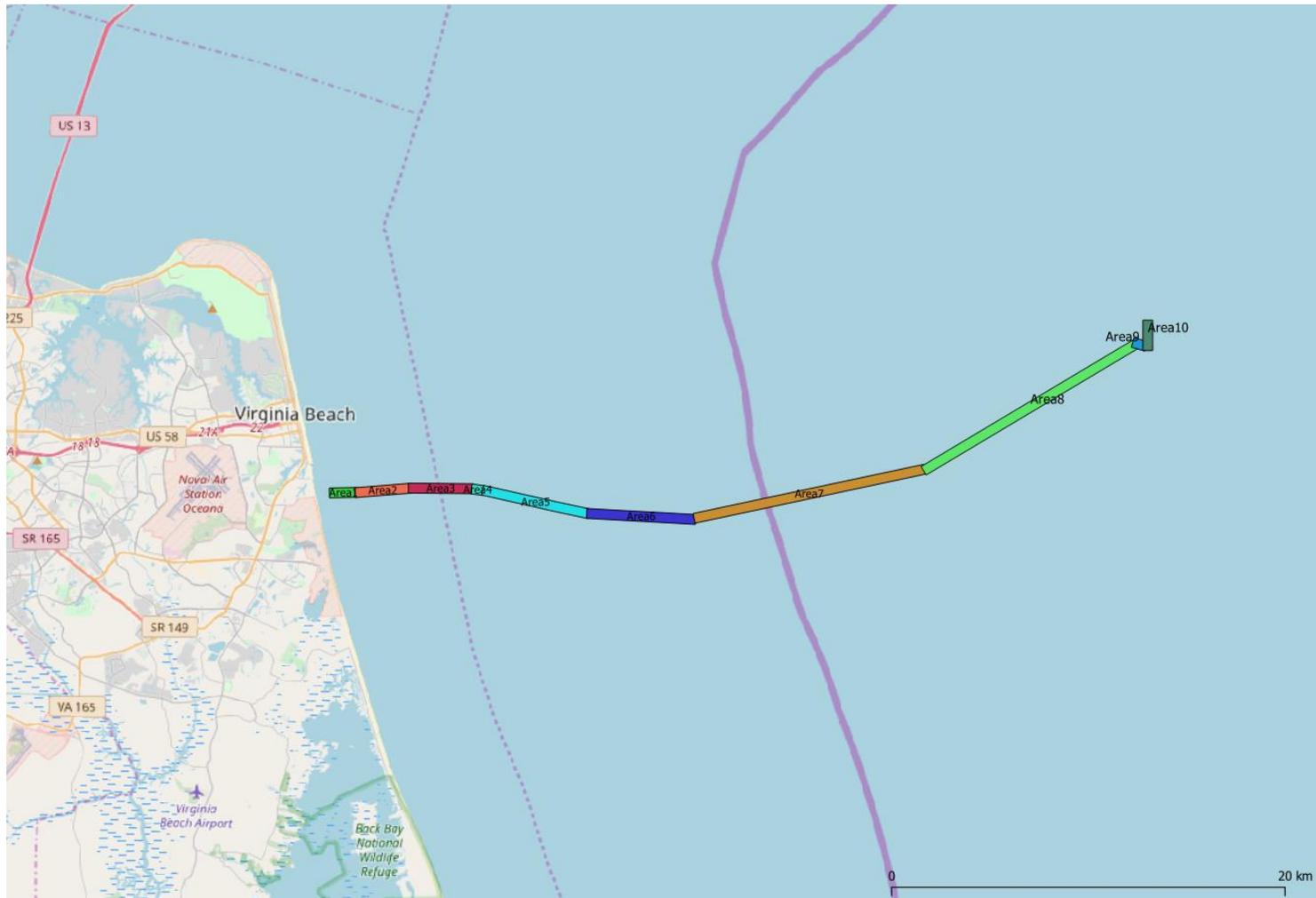


Figure 1: General location of the CVOW survey and survey blocks

1.2 Vessel and Energy Sources Specifications

All HRG survey operations were conducted solely by the *Gerry Bordelon*. The *Gerry Bordelon* measures 51.8 meters in length with a beam of 11 meters (Figure 2). The *Gerry Bordelon's* cruising speed was approximately 10 knots or less during transits and varied between three to five knots during the surveys. Survey data acquisition was conducted between 09 August to 23 October 2018.



Figure 2: The survey vessel *Gerry Bordelon*

The vessel was outfitted with an A-frame on the stern of the vessel to assist in survey equipment deployment. The A-frame was situated on the back deck and utilized for towing the side-scan and the scanfish. The survey equipment consisted of a differential GNSS positioning system, dual-head multibeam echosounder (MBES), dual-frequency sidescan sonar (SSS), four cesium-vapor magnetometers (MAGs) deployed on an Eiva scanfish array. Each towed system was equipped with an altimeter and depth sensors, Innomar medium parametric sub-bottom profiler (SBP) and ultra-short baseline (USBL) sub-surface positioning sonar. An overview of the towing configuration of the survey equipment is provided in Figure 3. The operating frequencies of the survey equipment are summarized in Table 1.

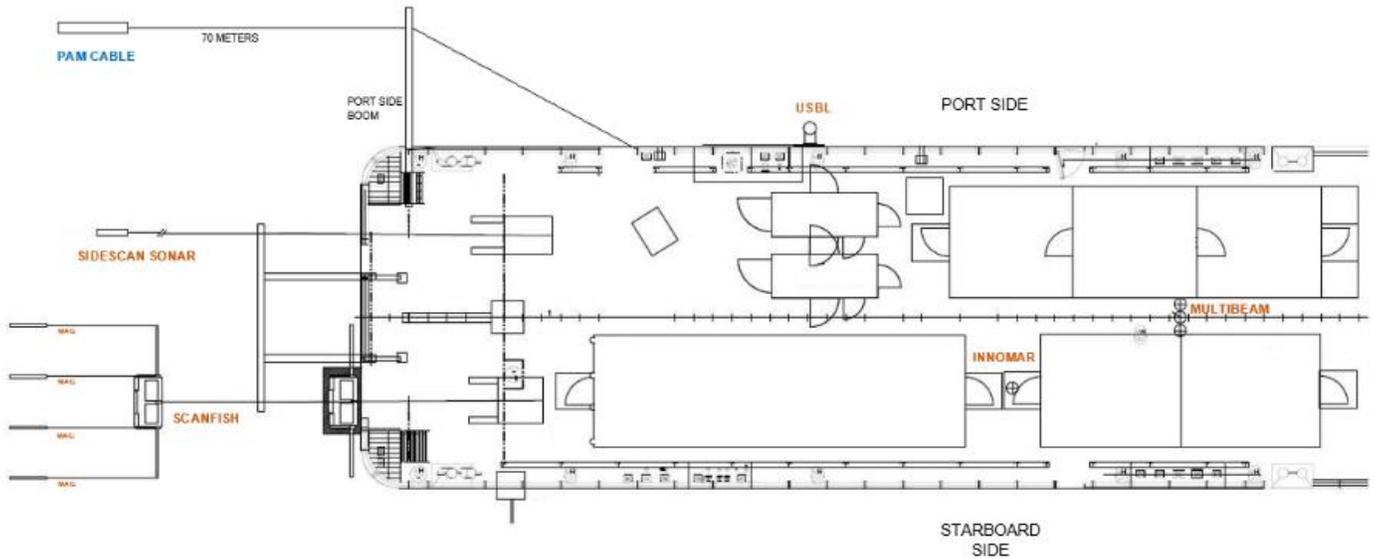


Figure 3: Upper view of the Gerry Bordelon with average towing gear location

Table 1: Acquisition Parameters Summary Table

General Specifications	
General Location:	1 to 43 km east of Virginia Beach, Virginia
Prospect Size (km ²):	7
Survey Blocks	10
Survey Lines	919
Vessel / Vessel Length (m):	Gerry Bordelon / 51.8 meters
Energy Source Specifications (frequency range)	
Multibeam	170-450 kHz
Sidescan sonar	400 / 900 kHz
Innomar	0-22 kHz
USBL	200-2500 Hz
Scanfish / Magnetometer	0-10 Hz

2 Mitigation and Monitoring Methods

The PSO monitoring program on the *Gerry Bordelon* was established to meet the standards set forth in by BOEM in the RAP, the approved Alternative Monitoring Plan and the IHA issued by NMFS. Survey mitigation measures were designed to minimize potential impacts of the survey activities on marine mammals, sea turtles, and other protected species of interest. The following monitoring protocols were implemented to meet these objectives.

- Visual observations were conducted day and night to provide real-time sighting data, allowing for the implementation of mitigation procedures as necessary.
- A PAM system was operated continuously during periods of reduced visibility to augment visual observations and provide additional marine mammal detection data.
- Effects of marine mammals and sea turtles exposed to sound levels constituting a potential “take” were observed and documented. The nature of the probable consequences was discussed when possible.

In addition to the mitigation objectives outlined in the above-referenced documents, PSOs collected and analyzed necessary data mandated by the IHA (see Appendix A).

2.1 Mitigation Methodology

Mitigation actions were implemented for visual and acoustic detections of protected species, including marine mammals and sea turtles as outlined in the RAP and the IHA, including:

- Establishment of Exclusion Zones around energy sources with operating frequencies below 200 kHz
 - 500-meter exclusion zone (EZ) for North Atlantic right whales.
 - 200-meter EZ was implemented for Endangered Species Act (ESA) listed animals and turtles.
 - 100-meter EZ was used for non-ESA listed non-delphinoid cetaceans.
 - 50-meter exclusion zone was used for all other marine mammal species.
- Search periods of 60 minutes conducted visually (daytime) or visually and acoustically (all periods of reduced visibility, including night) prior to the initiation of the sound sources from silence
- Delays to the initiation of the sound sources if marine mammals or sea turtles were detected inside their respective exclusion zones during the search period prior to the initiation of the source
- Shut-down of the active source upon detection of marine mammals or sea turtles inside their respective exclusion zones while a sound source with an operating frequency below 200 kHz was active and a subsequent search period of the exclusion zones
- Once the sound source had been shut down for a protected species detection, operations would not resume until a specific time had passed following the last detection of the animal(s) or once the animal had exited the EZ: 15 minutes for small delphinoid cetaceans and pinnipeds, 30 minutes for non-delphinoid cetaceans, 30 minutes for North Atlantic right whales, and 60 minutes for sea turtles (Note that a waiver request was submitted to BOEM for the reduction of clearance of exclusion zone times per the above and was approved by BOEM on 30 August 2018).

2.2 Visual Monitoring Survey Methodology

There were six trained and experienced PSOs on board the *Gerry Bordelon* during the program to conduct the monitoring for protected species, record and report detections, and request mitigation actions in accordance with the IHA, RAP Approval Conditions and AMP. The PSOs on board were NMFS approved and held certifications from an accepted BOEM PSO course. Visual monitoring was primarily carried out from the bridge wings of the *Gerry Bordelon* located approximately eight meters above the surface of the water, which allowed a 360-degree viewpoint around the vessel and acoustic sources.

The PSOs were equipped with 7x50 reticle binoculars, as well as two mounted 25x50 Big-eye binoculars and DSLR cameras (Nikon and Canon) with 200mm and 300mm zoom lens to aid in visual monitoring watches conducted during the day. Reticle binocular and Big-eye binoculars were calibrated weekly to ensure accuracy of distance data. Tables of the reticle calibrations can be found in Appendix B.

At night, PSOs were equipped with infrared LED handheld spotlights and night vision goggles with head mounts and thermal clip-ons. Specifications for the night monitoring equipment can be found in Appendix C.

A monitor inside the bridge displayed current information about the vessel (e.g. position, speed, heading, etc.), sea conditions (e.g. water depth, sea temperature, etc.), weather (e.g. wind speed and direction, air temperature, etc.), and source activity (e.g. survey line number, total number of active elements, volume, etc.). Environmental conditions, along with vessel and acoustic source activity, were recorded at least once an hour, or every time there was a change of one or more of the variables.

Most observations were held from the bridge wings such that the exclusion zones around the sound sources and the strike avoidance exclusion zone could be simultaneously monitored; however, during severe weather or during transits when the sound sources were not active, observations of the vessel strike avoidance zone could be conducted from the bridge.

Visual monitoring methods were implemented in accordance with the survey requirements outlined in the IHA, RAP Approval Conditions and AMP. One PSO visually monitored for protected species always during daylight hours and two PSOs visually monitored during all periods of reduced visibility throughout the survey, from the moment the vessel departed the dock at the beginning of the survey until the vessel returned to dock at the end of the survey, regardless of acoustic source activity. Visual monitoring during periods of acoustic source silence were conducted to gather baseline data on the presence and abundance of protected species in the areas.

A visual monitoring schedule was established by the PSOs where each person completed visual watches of varying lengths throughout the day. Scheduled watches were no more than four hours in duration and were each followed by at least two hours of scheduled break time.

Visual observations were conducted around the entire area of the vessel and acoustic sources. PSOs searched for blows, fins, splashes or disturbances of the sea surface, large flocks of feeding sea birds, and other sighting cues indicating the possible presence of a protected species. Upon the visual detection of a protected species, PSOs would first identify the animals' range to the vessel and acoustic source. Range estimations were made using reticle binoculars, the naked eye, and by relating the animal(s) to an object at a known distance. PSOs would also identify the animals' species, if possible upon initial detection, to ensure that the proper mitigation measures were implemented, should any be required.

PSOs recorded the following information for each protected species detection:

- I. Date, time of first and last sighting, observers on duty during the detection, location of the observers, vessel information (e.g. position, speed, heading), water depth, acoustic source activity (e.g. volume and number of active elements), and environmental conditions (e.g. Beaufort sea state, wind force, swell height, visibility and glare).
- II. Species, detection cue, group size (including number of adults and juveniles), visual description (e.g. overall size, shape of the head, position and shape of the dorsal fin, shape of the flukes, height and direction of the blow), observed behaviors (e.g. porpoising, logging, diving, etc.), and the initial and final pace, heading, bearing, and direction of travel in relation to both the vessel and the source (e.g. towards, away, parallel, perpendicular, etc.).
- III. Initial and final distance to the vessel and the source, time and distance of the closest distance to the source, time when entering and exiting the exclusion zones, type of mitigation action implemented, total time of the mitigation action and any production loss, description of other vessels in the area, and any avoidance maneuvers conducted.

During or immediately after each sighting event, the PSOs recorded the detection details per the requirements of the IHA and RAP Approval Conditions in a provided detection datasheet. Each sighting event was linked to an entry on an effort datasheet where specific environmental conditions and vessel activity were logged.

Species identifications were made whenever the distance of the animal(s), length of the sighting, and visual observation conditions allowed. Whenever possible during detections, photographs were taken with Canon and Nikon SLR cameras that had 200 and 300-millimeter telephoto lenses. Marine mammal identification manuals were consulted, and photos were examined during observation breaks to confirm identifications.

2.3 Passive Acoustic Monitoring Survey Methodology

Passive Acoustic Monitoring (PAM) was used to augment visual monitoring efforts in the detection, identification, and locating of marine mammals. PAM was particularly beneficial during periods of darkness or low visibility when visual monitoring was not as effective. Acoustic monitoring was conducted continuously during all survey operations and to the maximum extent possible during periods of acoustic source silence. When the acoustic source was activated following any period of silence, acoustic monitoring and visual monitoring were conducted for 60 minutes prior to the activation of the sound source.

Acoustic monitoring was undertaken by trained PAM Operators each of whom had completed a BOEM accepted PSO training course and an RPS in-house PAM training course, which includes use of the PAM systems on board a vessel offshore. PAM monitoring shifts were no longer than four hours in duration followed by at least a one-hour break.

The PAM system was in the main survey lab which provided space for the system, allow for quick communication with the visual PSOs and survey technicians, and provided access to the vessel's instrumentation screens. Information about the vessel (e.g. position, heading, and speed), water depth, source activity (e.g. line number, total volume, number of active elements), and the PAM system (e.g. cable deployments/retrievals, changes to the system, background noise score) were recorded at least once an hour, or whenever any of the parameters changed.

Acoustic monitoring for marine mammals was conducted aurally, utilizing Sennheiser headphones, and visually with the *Pamguard* software program. Low to mid-frequency delphinid whistles, clicks, and burst pulses, as well as sperm whale clicks and baleen whale vocalizations, could be visualized in *Pamguard's* spectrogram modules. Sperm whale, beaked whale, Kogia species, and delphinid clicks could also be visualized in low and high frequency click detector modules. Settings adjustments to amplitude range, amplitude triggers, and spectral content filters, among others, could be made in *Pamguard's* spectrogram and click detector modules to maximize the distinction between cetacean vocalizations and ambient signal. The map module within *Pamguard* could be utilized to attempt localizing the position and range of vocalizing marine mammals. Sound recordings could be made using the high and low frequency sound recording modules when potential marine mammal vocalizations were detected, or when the operator noted unknown or unusual sound sources.

PAM operators recorded the following information during acoustic detections of protected species:

- I. Date, time of first and last detection, operator on duty, if the detection was linked to a visual sighting, vessel information (e.g. position, speed, heading), water depth, and acoustic source activity (e.g. volume and number of active elements).
- II. Species (if determinable), group size, methods/modules on which vocalizations were detected during the event, and vocalization characteristics (e.g. signal type, frequency and amplitude range, inter-click interval, patterns, etc.)
- III. Determinable bearings (to the hydrophones, vessel and source), estimated and/or attempted localizations and any ranges determined, type and time of any implemented mitigation actions and any resulting production loss.

2.3.1 Passive Acoustic Monitoring Parameters

A passive acoustic monitoring system designed to detect most species of marine mammals was installed on board the *Gerry Bordelon*. The system was developed by *Seiche Measurements Limited* and consisted of the following main components: a 250 meter hydrophone cable (configured as a separate 230 meter steel-reinforced tow cable and detachable 20 meter hydrophone array); a 100 meter deck cable; a rack-mounted electronic processing unit (EPU) that incorporated a buffer unit, a RME Fireface 800 unit, and a computer; two desktop monitors; acoustic analysis software package; and headphones for aural monitoring. A spare hydrophone cable, deck cable, rack-mounted DPU and computer, monitors, and headphones were also present on board in the event the main system components became damaged or inoperable. The diagram in Figure 4 is a simplified depiction of the PAM system installed on the *Gerry Bordelon*. Further PAM system specifications can be found in Appendix D.

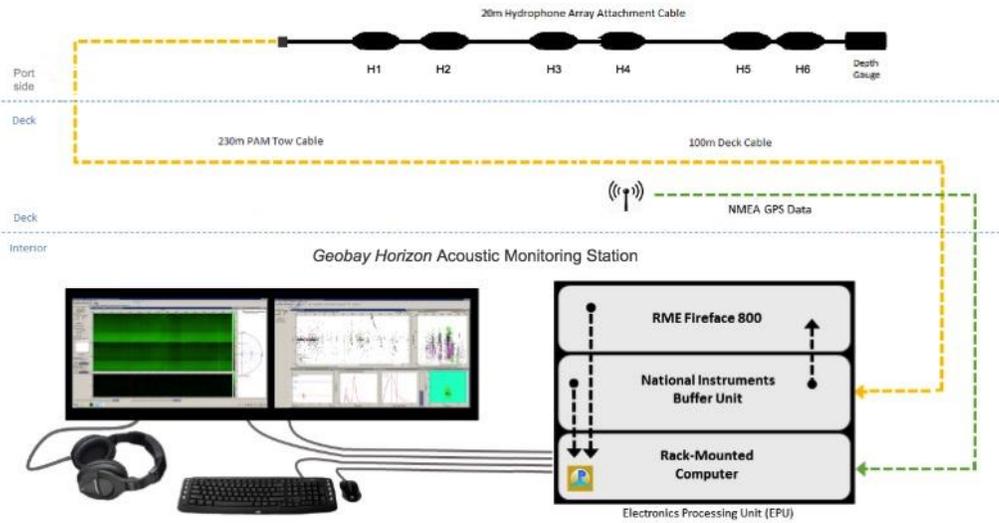


Figure 4: Simplified pathway of data through the PAM system on board the Gerry Bordelon.

The 20-meter linear hydrophone array attachment cable contained six individual hydrophone elements spaced eight meters, two meters and 0.25 meters apart, as well as a depth transducer (Figure 5). The forward hydrophone pair (H1, H2) was used to analyze and record low frequencies (10 – 24,000 Hz); the middle hydrophone pair (H3, H4) was used to analyze and record middle frequencies (200 – 200,000 Hz), and the trailing hydrophone pair (H5, H6) was used to analyze and record high frequency sound (2,000 – 200,000 Hz). The hydrophone array cable was attached to the 230-meter heavy-duty tow cable and manually deployed from the port-side on the back deck. The connector end of the tow cable was attached to the 100-meter deck cable located on a storage room at the port side of the vessel. The deck cable was secured with cable ties to hand rails that led it through the port side of the vessel and into the instrument room, where the PAM station was located.

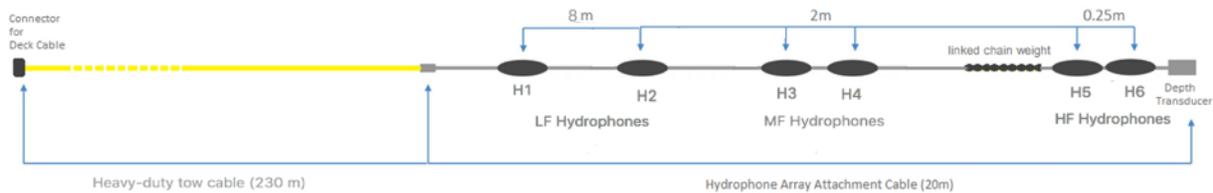


Figure 5: Diagram of hydrophone element separation and location of added weight on 250m hydrophone cable.

The deck cable interfaced between the hydrophone cable installed on the back deck of the vessel and the electronics processing unit (EPU) located in the main survey lab. The rack-mounted EPU was set up with the two pre-installed, wall-mounted monitors, keyboard, mouse and headphones. The EPU contained a buffer unit with Universal Serial Base (USB) output, an RME Fireface 800 ADC unit with firewire output, and a rack-mounted computer. A Global Positioning System (GPS) feed of GNGGA strings was supplied from the ship’s navigation system and routed to the computer, reading data every 20 seconds. Data from the hydrophone cable’s depth transducer was routed through the buffer unit to the computer, via USB

connection. *Pamguard Beta* versions 1.15.11 and 1.15.13 were the software versions utilized for monitoring during the survey.

Raw feed from hydrophone elements H5 and H6 was digitized in the buffer unit using an analogue-digital National Instruments data acquisition (DAQ) soundcard at a sampling rate of 500 kilohertz. The output was filtered for high frequency (HF) content and visualized using the *Pamguard* software. A sixth order Butterworth high-pass digital pre-filter of 30 kilohertz and a high-pass trigger filter of 40 kilohertz were applied. *Pamguard* used the difference between the time that a signal arrived at each of the two hydrophones to calculate and display the bearing to the source of the signal. A scrolling bearing/time module displayed the filtered data in real time, allowing for the detection and directional mapping of click trains. Additional components of the HF click detector system in *Pamguard* were an amplitude/time display that registered click intensity data in real time, as well as click waveform, click spectrum, and Wigner plot displays, providing the PAM operator immediate review of individual click characteristics in the identification process. One of the two monitors were designated for displaying *Pamguard* HF click detector and sound recorder modules.

Raw feed from the MF and LF hydrophone elements (H1, H2, H3, H4) was routed from the buffer unit to the RME Fireface 800 unit, where it was digitized at a sampling rate of 48 kilohertz. The relatively low frequency (LF) output was further processed within *Pamguard* by applying Engine Noise Fast Fourier Transform (FFT) filters, including click suppression and spectral noise removal filters (e.g. median filter, average subtraction, Gaussian kernel smoothing and thresholding). Filtered LF content was visualized in two spectrograms, one displaying two channel feeds at frequency ranges of three to 24 kilohertz, and another displaying one channel feed at a frequency range of zero to three kilohertz. LF click detector modules allowed for review of individual click characteristics as well as the detection and tracking of click trains.

A map module on the LF system interfaced with GPS data provided by the vessel to display the vessel location and could be used to determine range and bearing estimates based on clicks tracked in the click detector module. *Pamguard* contains a function for calculating the range to vocalizing marine mammals based upon the least squares fit test. This method is most effective with animals that are relatively stationary in comparison to the moving vessel, such as sperm whales. The mathematical function estimates the range to vocalizing marine mammals by calculating the most likely crossing of a series of bearing lines generated from tracked clicks or whistles and plotted on a map display. Additionally, the bearings of detected whistles and moans were calculated using a Time-of-Arrival-Distance (TOAD) method (the signal time delay between the arrival of a signal on each hydrophone is compared), and presented on a radar display, along with amplitude information for the detected signal as a proxy for range.

Additional modules displayed on the LF monitor included an LF sound recorder and clip generator. The clip generator module within *Pamguard* could also be used to generate short sound clips in response to either an automatic detection or the operator manually selecting a portion of the spectrogram display. This module was useful in the event that the whistle-and-moan detector falsely triggered and identified a non-biological sound (i.e. echosounder) or if it missed detecting tonal signatures that the operator determined to be vocalizations.

2.3.2 Hydrophone Deployment

The hydrophone cable was deployed manually from the port stern of the vessel's back deck. Two deck cables, a main and a spare, were installed along the deck running from the stern winch to the main survey lab. The hydrophone cable was deployed off the port stern and attached via tow rope to the port side

boom to move the cable further away from the vessel and the other towed equipment. The hydrophone cable was approximately 80 meters from the port stern of the vessel.

PAM system specifications can be found in Appendix D, and a more detailed description of the hydrophone deployment method can be found in Appendix E.

3 Survey Operations and Monitoring Effort

3.1 Survey Operations Summary

3.1.1 General Survey Parameters

Operations for the Survey began when the *Gerry Bordelon* transited from Norfolk, VA to the survey site on 09 August 2018 and data acquisition began at 23:55 UTC on 09 August 2018.

Acquisition continued according to the survey plan and survey operations were only suspended when operationally necessary, for weather, equipment maintenance or crew changes, as outlined in Table 2.

The Survey was completed at 07:30 UTC on 23 October 2018 and the *Gerry Bordelon* transited to port that same day.

Table 2: Transits during CVOW 2018

Date Depart	Date Arrive	Description of Transit
08-09-2018	08-09-2018	Transit from Norfolk port to prospect site.
08-13-2018	08-14-2018	Transit from prospect to Norfolk for small crew change.
08-17-2018	08-17-2018	Transit from Norfolk water back to prospect.
08-24-2018	08-24-2018	Transit from prospect to Norfolk for generator replacement.
08-25-2018	08-25-2018	Transit from Norfolk to prospect after maintenance.
08-28-2018	08-28-2018	Transit from prospect to Norfolk for crew change.
08-29-2018	08-29-2018	Transit from Norfolk to prospect after crew change.
09-09-2018	09-09-2018	Transit from prospect to Norfolk for hurricane shelter.
09-20-2018	09-20-2018	Transit from Norfolk to prospect after hurricane.
09-24-2018	09-24-2018	Transit from prospect to Norfolk for crew change.
09-26-2018	09-26-2018	Transit from Norfolk port to prospect site.
09-28-2018	09-28-2018	Transit to Norfolk from prospect for maintenance.
09-29-2018	09-29-2018	Transit from Norfolk port to prospect site.
10-10-2018	10-10-2018	Transit from prospect to Norfolk for hurricane shelter and crew change.
10-13-2018	10-13-2018	Transit from Norfolk port to prospect site.
10-15-2018	10-15-2018	Transit to Norfolk from prospect for maintenance.
10-16-2018	10-16-2018	Transit from Norfolk port to prospect site.
10-23-2018	10-23-2018	Transit to Norfolk from prospect for the end of the project

3.1.2 HRG survey equipment operations

The *Gerry Bordelon* was engaged in source operations for a total of 904 hours and 40 minutes during the survey. This total includes source operations on a survey line and source operations not on a survey line: 392 hours and 49 minutes of survey acquisition and 510 hours and 26 minutes of source activity while not actively in acquisition (typically on approach to the start of a survey line).

The total duration of HRG source testing throughout the survey program was one hour and 25 minutes.

None of the acoustic sources utilized in survey operations were capable of being ramped-up, so the sources were either silent or active and there was no time incurred for ramp-up operations during the survey program.

Table 3: Acoustic Source Operations during CVOW

Acoustic Source Operations	Duration HH:MM
Source Tests	01:25
Ramp-up	0:00
Source Activity on a Survey Line	392:49
Source Activity not on a Survey Line	510:26
Total Time Acoustic Sources Were Active	904:40

3.2 Visual Monitoring Survey Summary

Visual monitoring during the survey program was conducted day and night by one or two PSOs respectively, starting when the vessel left the dock and terminating upon return to port. Visual observations were suspended only while the vessel was pierside in-port, and on one occasion during survey operations due to a severe electrical storm in the area. When visual monitoring was suspended, low-frequency (less than 200 kHz) source operations were also suspended.

The PSOs conducted visual observations for a total of 1235 hours and 35 minutes over a period of 61 days. Of this total visual monitoring effort, 718 hours and 11 minutes was accumulated during daylight hours and 517 hours and 24 minutes was undertaken at night using night vision monitoring equipment.

Of the overall total visual monitoring effort, 72% (886 hours and 35 minutes) was undertaken while the acoustic sources were active, and 28% (349 hours) was undertaken while the acoustic sources were silent. Visual monitoring while the acoustic source was silent was mainly conducted during the transits to and from the survey sites, and during equipment deployment, recovery and maintenance.

Table 4 detail visuals monitoring with acoustic source operations throughout the Survey program.

Table 4. Total Visual Monitoring Effort during the CVOW Survey Program

Visual Monitoring Effort	Duration (hh:mm)	% of Overall Visual Monitoring Effort
Total monitoring while acoustic source active	886:35	72%
Total monitoring while acoustic source silent	349:00	28%
Total monitoring effort	1235:35	100%
Total monitoring during daylight	718:11	58%
Total monitoring during reduced visibility	517:24	42%
Total monitoring effort	1235:35	100%

3.3 Acoustic Monitoring Summary

Acoustic monitoring during the Survey was conducted continuously throughout acoustic source operations and to the maximum extent possible while the acoustic source was silent during all periods of reduced visibility, including night, beginning on 10 August 2018.

Throughout the entire survey program, acoustic monitoring was conducted on 47 days for a total of 429 hours 47 minutes.

Of the overall total acoustic monitoring effort, 92% (393 hours 20 minutes) was undertaken while the acoustic source was active, and 8% (36 hours 27 minutes) was undertaken while the acoustic source was silent. Acoustic monitoring while the acoustic source was silent was mainly conducted during the brief periods of time between recovery/deployment of the seismic gear and recovery/deployment of the PAM cable

Table 5 details acoustic monitoring with acoustic source operations throughout the CVOW program.

Table 5. Total Acoustic Monitoring Effort during the CVOW Survey Program

Acoustic Monitoring Effort	Duration (hh:mm)	% of Overall Visual Monitoring Effort
Total monitoring while acoustic source active	393:20	92%
Total monitoring while acoustic source silent	36:27	8%
Total acoustic monitoring effort	429:47	100%
Total monitoring occurring with concurrent visual monitoring	328:47	99.8%
Total monitoring occurring as PAM only	01:00	0.2%
Total acoustic monitoring effort	429:47	100%

Visual observers and PAM Operators simultaneously monitored the exclusion zone and surrounding areas for 428 hours and 47 minutes during the survey. This is nearly equal to the total time of acoustic monitoring: only one hour of PAM was conducted without visual monitoring, when visual monitoring was suspended due to an electrical storm in the survey area.

3.4 Environmental Conditions

Environmental conditions can have an impact on the probability of detecting protected species in a survey area. The environmental conditions present during visual observations undertaken during this survey program were mild to moderate.

Visibility was classified as 'excellent' if it extended to five kilometers or greater, 'moderate' if they were between two to five kilometers, and 'poor' if they were less than two kilometers. Visibility conditions were excellent for 55% of the overall visual monitoring effort, totaling 676 hours and 53 minutes. Visibility conditions were moderate for 3% of the overall visual monitoring effort, totaling 40 hours and 41 minutes. Poor visibility conditions occurred for 42% of the overall visual monitoring effort, totaling 518 hours and one minute. Poor visibility consisted of periods of rain or fog, the brief periods of reduced lighting before sunrise and after sunset, as well as night-vision monitoring (**Error! Reference source not found.**).

Table 6: Summary of Visibility during Visual Monitoring

Visibility	Duration (hh:mm)	% of Overall Visibility
Excellent (Greater than five kilometers)	676:53	55%
Moderate (two to five kilometers)	40:41	3%
Poor (less than two kilometers)	518:01	42
Total Visual Monitoring Effort	1235:35	

*Total hours of poor conditions include night-vision monitoring

The Beaufort Sea state recorded during visual monitoring ranged from level one to level eight over the course of the survey program. A total of 1046 hours and 46 minutes (85%) of visual observations were undertaken in conditions where the Beaufort state was level three or less, which were considered good conditions for the detection of protected species. Beaufort Sea states of four to six were recorded for a total of 187 hours and 37 minutes, 15% of all visual monitoring observations. Beaufort Sea states of seven to eight were recorded for a total of one hour 12 minutes, 0% of all visual monitoring observations (**Error! Reference source not found.**).

Table 7: Summary of Beaufort Sea state during Visual Monitoring

Beaufort Sea State	Duration (hh:mm)	% of Overall Visibility
B0 to B3	1046:46	85%
B4 to B6	187:37	15%
B7 to B8	01:12	0%

Swell heights during visual observations were generally low, with swells of less than two meters recorded for 46 hours and two minutes, 4% of the total visual effort during the survey program. Swells between two and four meters were recorded for 1189 hours and 33 minutes, 96% of the total visual effort. Swells did not exceed four meters during the survey (Table 8).

Table 8: Summary of Swell Height during Visual Monitoring

Beaufort Sea State	Duration (hh:mm)	% of Overall Visibility
Less than 2 meters	46:02	4%
2 to 4 meters	1189:33	96%

During the Survey, there were two occasions where the environmental conditions impeded visual monitoring. On 31 August at 02:59 UTC, due to a lightning storm, the PSOs had to go inside the vessel and call for a shut-down as the night vision devices couldn't cover the entire exclusion zone. On 05 October at 09:35 UTC, visibility was significantly reduced due to wind and rain. After a few minutes of assessing if the conditions permitted efficient monitoring of the entire exclusion zone, at 9:39 UTC, visibility was completely lost and, at 09:40 UTC, a shut-down was implemented.

4 Protected Species Detection Results

There were 84 detection events of marine mammals during this survey and 108 detections of sea turtles. Detections consisted of three species of marine mammals, all delphinids (bottlenose dolphins, Atlantic spotted dolphins and melon-headed whales) and three species of sea turtles (leatherback, loggerhead and green sea turtles) (Table 9, Figure 6).

Table 9: Number of Detection Records Collected for each Protected Species during the survey program

Species	Total Number of Detection Records	Total Number of Animals Recorded
Dolphins		
Bottlenose dolphins	66	851
Atlantic spotted dolphins	1	15
Unidentifiable dolphins	16	61
Melon-headed whales	1	5
Sea Turtles		
Leatherback sea turtle	58	60
Loggerhead sea turtle	32	32
Green sea turtle	1	1
Unidentifiable shelled sea turtle	17	17

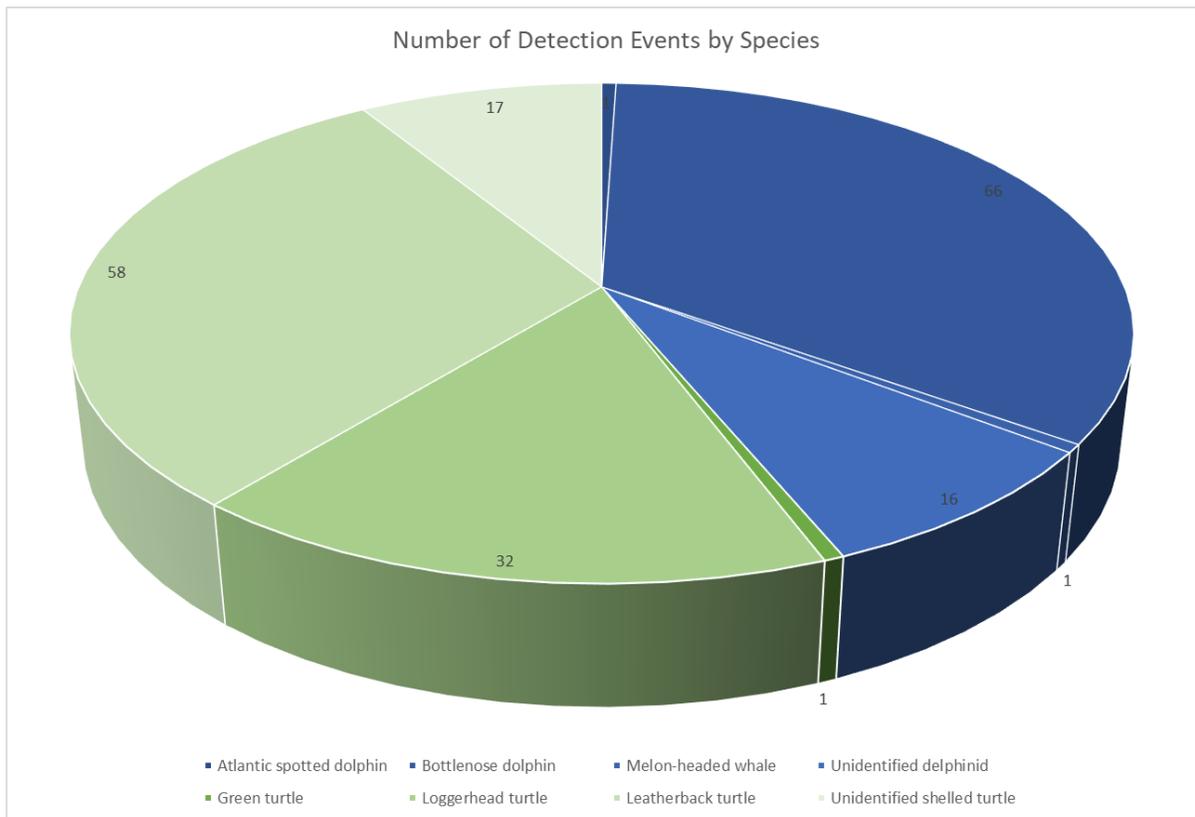


Figure 6: Number of detection events by species group during the survey program

Of the total species detected, 120 detections occurred while the survey sources were active and 72 occurred while all the survey sound sources were silent. Dolphin species averaged 245 meters to active sources and 101 meters to inactive sources. Turtle species averaged 139 meters from active sources and 70 meters to inactive sources (Table 10).

Table 10: Average Closest Approach of Protected Species to the Acoustic Source during the Survey Program

Species Detected	Active Source		Inactive Source	
	Number of detections	Average closest approach to source (meters)	Number of detections	Average closest approach to source (meters)
Bottlenose dolphins	43	219	23	238
Atlantic spotted dolphins	0	0	1	5
Melon-headed whales	1	600	0	0
Unidentified dolphins	9	162	7	163
All Dolphin Species	53	245	31	101
Leatherback sea turtle	30	197	28	133
Loggerhead sea turtle	22	220	10	86
Green sea turtle	1	40	0	0
Unidentified Shelled Sea Turtle	14	99	3	63
All Sea Turtle Species	67	139	41	70

A summary table of each detection event is provided in Appendix F and Appendix G.

Photographs taken during detection events are included in Appendix H. Screenshots taken during acoustic detection events are included in Appendix I.

4.1 Marine Mammal Detection Summary

A total of 84 marine mammal detection events were recorded during the survey. Detections were made both visually by PSOs and acoustically by PAM Operators, but visual detections occurred more frequently than any other method: 76 visual detections, three acoustic detections and five detections that were made both visually and acoustically (Figure 7). Of the 76 detections that were made visually only, only four occurred at night while there was also acoustic monitoring on-going.

When factoring in monitoring effort to calculate the marine mammal detection rate during the survey, the overall acoustic detection rate is still significantly lower than the visual detection rate (Table 11).

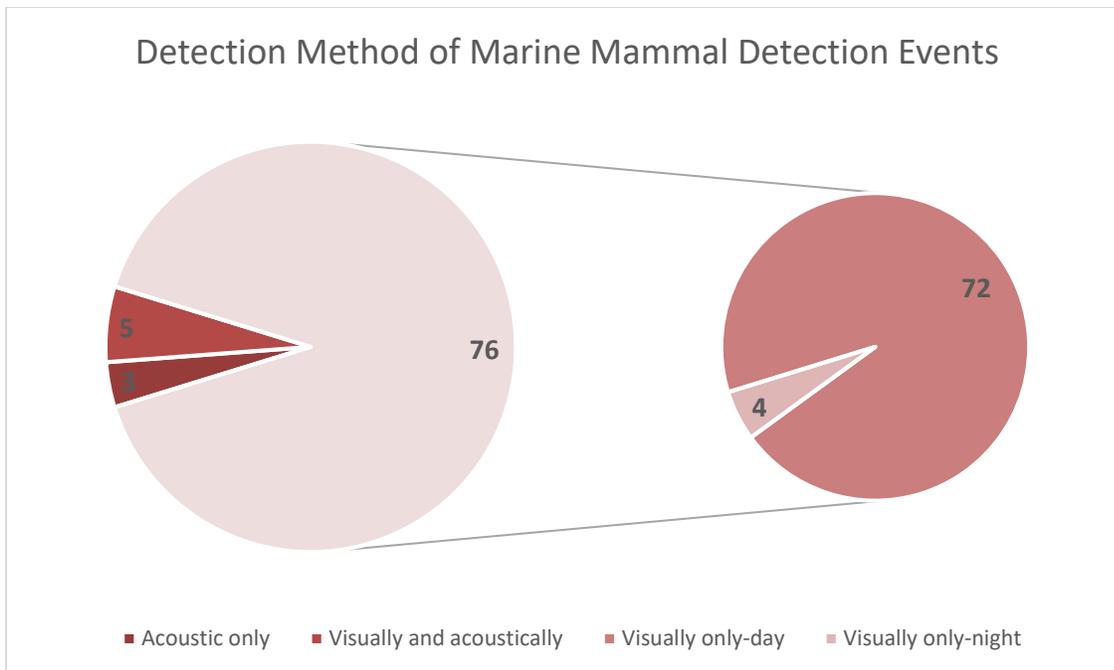


Figure 7: Detection method of marine mammal detection events during survey

Table 11: Detection rate of marine mammal detections for visual and acoustic monitoring during the survey program

Monitoring method	Number of detections made	Monitoring Effort (HH:MM)	Monitoring Effort (Decimal)	Detection rate (Dets/hour effort)
Visual monitoring	81	1235:35	1235.5833	0.0656
Acoustic monitoring	8	429:47	429.7833	0.0186

Three different marine mammal species, all delphinid species, were detected during the survey. Bottlenose dolphins were detected far more often than any other species, a total of 66 times. Single detections were made of a small group of Atlantic spotted dolphins and melon-headed whales. Pods of unidentified delphinids were also detected on 16 occasions where either the brevity of the sighting event, the visual conditions at the time of the sighting or the distance at which the sighting was made enabled a positive species identification. More detail is provided concerning detection events by species in Sections 4.1.1 through 4.1.4

The location of each marine mammal detection event is shown in relation to the survey area in Figure 8.

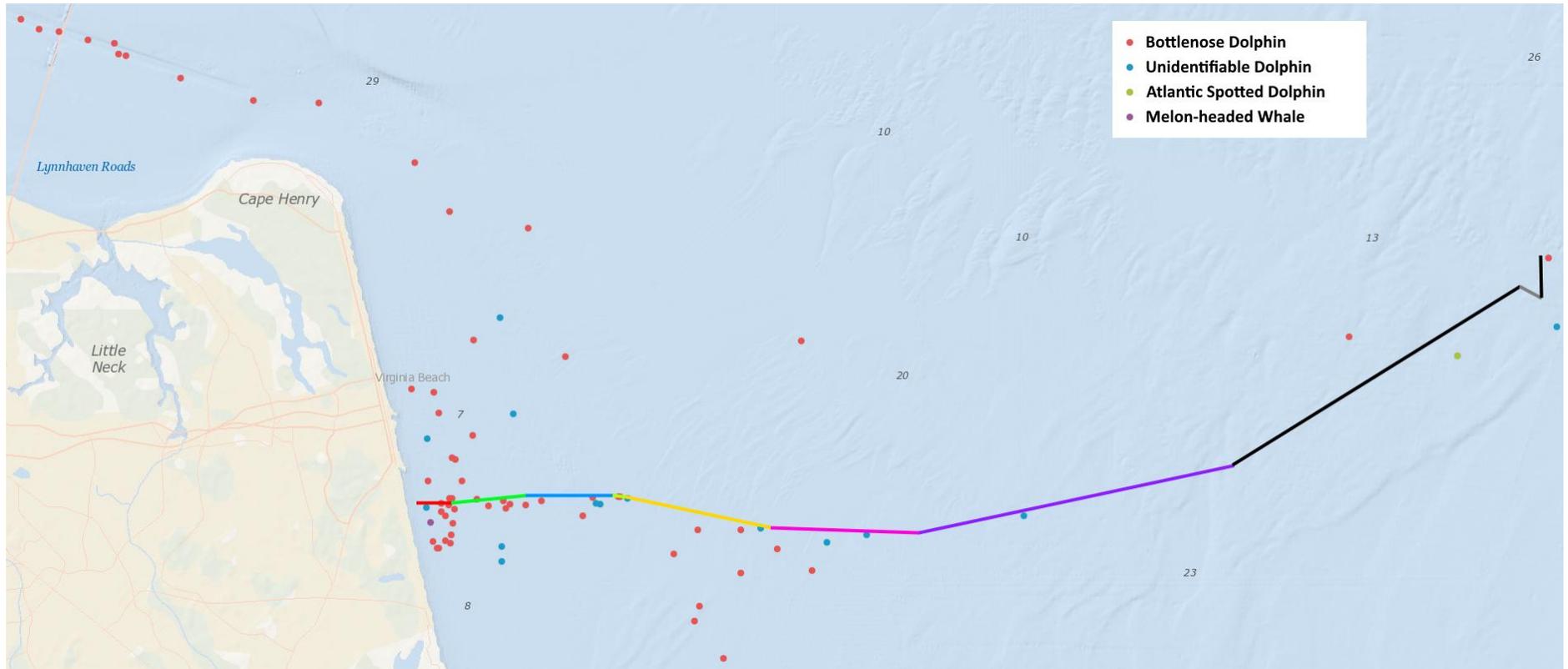


Figure 8: Location of marine mammal detection events shown overlaid with the survey blocks

4.1.1 Bottlenose dolphin

Bottlenose dolphins were detected more frequently than any other marine mammal species, with 66 detections during the survey. 23 detections occurred while the sources were silent and 43 while the sources were active. The closest point of approach to the active sources was 20 meters, and the closest approach during source silence was five meters. Pods ranged in size from a single animal to approximately 100 individuals, with a few detections of pairs of dolphins. In general, bottlenose dolphins were observed exhibiting acrobatic behavior, swimming, porpoising and splashing, traveling fast, milling, surfacing and diving.

4.1.2 Atlantic spotted dolphin

There was only one detection of Atlantic spotted dolphins during the survey. The sighting occurred while the acoustic sources were silent, with no mitigation action attributed to the detection. The pod consisted of 15 individuals, with a closest point of approach to the vessel of five meters. They were initially observed 5000 meters away while approaching the vessel at a moderate pace, diving and exhibiting acrobatic behavior with tail and pectoral slapping.

4.1.3 Melon-headed whale

There was only one detection of melon-headed whales during the survey. The detection occurred while the sources were active, with a closest point of approach of 600 meters. No mitigation actions resulted from this sighting. The group consisted of five individuals and they were observed blowing, surfacing, milling, porpoising and diving.

4.1.4 Unidentified dolphin

There were nine detections of unidentified dolphins during the survey: seven while the sources were active and two when sources were silent. Unidentified dolphin detections had a closest observed approach of 25 meters to the active sources and a closest point of approach of 20 meters when the sources were silent. Pod sizes varied from one to nine dolphins, where generally the animals were observed engaging in swimming and surfacing behaviors.

4.2 Visual Sea Turtle Detections

Three different sea turtle species were sighted on 108 occasions during the survey. Detections of leatherback (58 detection events) and loggerhead (32 detection events) were the most frequent and a green sea turtle was observed on one occasion. Unidentified shelled turtles were also detected on 17 occasions where either the brevity of the sighting event, the visual conditions at the time of the sighting or the distance at which the sighting was made enabled a positive species identification. More detail is provided concerning detection events by species in Sections 4.2.1 through 4.2.4

The location of each sea turtle detection event is shown in relation to the survey area in Figure 9.



Figure 9: Location of sea turtle detection events shown overlaid with the survey blocks

4.2.1 Leatherback sea turtle

There were 58 detections of leatherback sea turtles during the survey. The closest point of approach to the active sources was 15 meters, and the closest during source silence was 10 meters. Leatherback sea turtle detections resulted in the implementation of 45 mitigation actions: 20 shut-downs of the active sources and 25 delays of source activity, totaling 34 hours and ten minutes of production loss. Most of the detections were of single individuals and only one consisted of two turtles. Generally, leatherback sea turtles were observed surfacing, diving, swimming below and on the surface at a sedate or moderate pace, and briefly resting on the surface.

4.2.2 Loggerhead sea turtle

There were 32 detections of loggerhead sea turtles during the survey. Ten detections occurred during source silence and 22 while the sources were active. The closest point of approach to the active sources was 12 meters, and the closest during source silence was 15 meters. There were 14 shut-downs of the active sources and nine delays of source activity implemented for loggerhead turtle sightings. Loggerhead sea turtle detections consisted of one individual, where the turtle was most often observed surfacing and/or swimming below the surface.

4.2.3 Green sea turtle

There was a single detection of a green sea turtle during the survey. The sighting occurred when the acoustic sources were shut-down, with no mitigation action attributed to the detection. The closest point of approach of the animal to the vessel was 35 meters. The green sea turtle was observed surfacing with its head visible above the water, swimming below the surface at a moderate pace and finally diving.

4.2.4 Unidentifiable shelled sea turtle

There were 17 detections of unidentifiable shelled sea turtles during the survey. Fourteen detections occurred while the sources were active and three while the sources were inactive. The closest point of approach to the active sources was 20 meters, and the closest during source silence was 30 meters. Unidentified shelled sea turtle detections consisted of a single turtle observed, where the most frequent behaviors observed included resting on the surface, swimming with the head visible above the water before diving, or swimming below the surface.

4.3 Acoustic Detections

There were eight detections made during the survey program, all delphinids. The species was identified on only one occasion (bottlenose dolphins) when there was a concurrent visual sighting where the PSOs were able to identify the dolphins to species. The remaining seven acoustic detection events, including four additional detections for which there were concurrent visual detections, were identified to the level of 'unidentified delphinid'. Most acoustic detections consisted of a combination of observed high-frequency click trains on the Pamguard Click Detector and aurally and visually detected tonal sounds on the Pamguard Spectrogram and Whistle Moan Detector (Table 12).

Table 12: Summary of acoustic detections occurring during the survey program

Acoustic Detection Number	Concurrent visual detection	Detection first made	Detection properties:		
			HF Click Detection	Visually observed tonal sounds	Aurally detected tonal sounds
1	Yes (VD#29)	Simultaneously	Yes	Yes, up to 17kHz	Yes
2	Yes (VD#43)	Visually	Yes, between 45 and 120 degrees	No	No
3	No	N/A	Yes, between 90 and 110 degrees	No	No
4	No	N/A	Yes, between 90 and 120 degrees	Yes, 7-10kHz	Yes
5	Yes (VD#44)	Acoustically	Yes, between 40 and 120 degrees	Yes, 9-12kHz	Yes
6	Yes (VD#45)	Simultaneously	Yes, between 50 and 110 degrees	Yes, 5-23 kHz	Yes
7	Yes (VD#47)	Simultaneously	Yes, between 30 and 135 degrees	Yes, 5-24 kHz	Yes
8	No	N/A	No	Yes	Yes

5 Mitigation Actions Summary

There were 109 mitigation actions implemented during this survey (Table 13). Mitigation actions consisted of 69 shut-downs of an active source and 40 delays to the initiation of the source(s). The total duration of mitigation downtime accumulated by the implementation of those 109 actions totaled 79 hours 27 minutes. Mitigation downtime was calculated using the total duration that the animal(s) was observed inside its respective exclusion zone plus the additional search period time required following its detection before the vessel was permitted to resume source operations. Mitigation downtime does not represent the total lost operational time because of the mitigation action as often additional time is needed for the vessel to circle to approach the survey line again, or to fill in a hole on a survey line left by a shut-down or delay. The production loss accumulated by implementation of mitigation was 83 hours.

Table 13: Number and Duration of Mitigation Actions Implemented during the Survey Program

Mitigation Action	Dolphins			Sea Turtles		
	Number	Mitigation Downtime	Production Loss	Number	Mitigation Downtime	Production Loss
Delay of Source Initiation	4	3:54	3:54	36	25:59	26:41
Shutdown of Active Source	21	8:29	8:30	48	41:05	43:55
Total Mitigation	25	12:23	12:24	85	67:04	70:36

Mitigation actions were implemented for one dolphin species and two turtle species, as well as both unidentified delphinids and unidentified shelled sea turtles: leatherback sea turtles accounted for 40%; loggerhead sea turtles for 28%; unidentified sea turtles accounted for 17%; common bottlenose dolphins accounted for 6%; and, unidentified dolphins accounted for 10% of the mitigation down time. In terms of production loss, leatherback sea turtles accounted for 42%, loggerhead sea turtles for 24%, unidentified sea turtles accounted for 19%, common bottlenose dolphins accounted for 5%, and unidentified dolphins accounted for 10% (Error! Reference source not found.).

Table 14: Mitigation Actions and Downtime Duration by Species during the Survey Program

Species	Number of Delays	Number of Shut-downs	Duration of Mitigation Downtime	Percentage of Mitigation Downtime	Duration of Production Loss	Percentage of Production Loss
Bottlenose dolphin	0	16	04:47	6%	04:29	5%
Leatherback sea turtle	24	21	31:31	40%	34:40	42%
Loggerhead sea turtle	9	14	21:53	28%	20:18	24%
Unidentified delphinids	4	5	07:36	10%	07:55	10%
Unidentified shelled sea turtles	3	13	13:40	17%	15:38	19%

40 delays to operations were attributed to detections of two turtle species as well as detections of unidentified dolphins and turtles. 69 shut-downs of the active source were attributed to detections of one species of dolphins and two species of turtle, as well as detections of unidentified dolphins and turtles. A summary of each mitigation action can be found in Appendix J.

5.1 Marine Mammals Known to have been Exposed to 160dB or Greater of Received Sound Levels

NMFS granted an IHA for the survey allowing Level B harassment takes (exposure to sound pressure levels equal to or greater than 160 dB re: 1 μ Pa (rms) where there is a potential for behavioural changes) for eight marine mammal species during the CVOW survey. For sea turtles, behavioural harassment (Level B) was expected to occur in the 175 dB zone, and PTS (Level A) was expected to occur in the 195 dB zone.

A total of 1,627 individual marine mammals from eight species were authorized for Level B takes in the IHA. No Level A takes were authorized. During the Survey, 35 protected species, all bottlenose dolphins, were observed within the Level B Harassment zone and no protected species were observed within the Level A harassment zone while the acoustic sources were active (Table 15). Two bottlenose dolphin ecotypes were authorized for potential Level B Takes. Each bottlenose dolphin ecotype had 350 individual Level B Takes authorized, for a combined total of 700 Level B Takes. Although PSOs were unable to distinguish between the two ecotypes while offshore, the 35 bottlenose dolphin detections fall well below the allowable 350 potential Level B Take for either ecotype.

Table 15. Number of Authorized and Potential Level A and B Harassment Takes During the Virginia UXO HRG program

Species	IHA Authorized Level A Takes	Potential Level A Takes / PTS During the Program	IHA Authorized Level B Takes	Potential Level B Takes / TTS During the Program
Bottlenose dolphin – N. Coastal Migratory	0	0	350	35
Bottlenose dolphin- Offshore	0	0	350	
Atlantic spotted dolphin	0	0	300	0
Common dolphin	0	0	400	0
Atlantic white-sided dolphin	0	0	200	0
Short-finned/long-finned pilot whale	0	0	15	0
Harbor porpoise	0	0	6	0
Harbor seal	0	0	5	0
Gray seal	0	0	1	0

The number of potential takes may be an underestimation and, therefore, may be a minimum estimate of the actual number of protected species potentially exposed to received sound levels within the predicted Level A and Level B harassment zones. It is possible that the estimated numbers of animals recorded were underestimates due to some animals not being seen or having moved away before they were observed. This is most likely to have occurred with large pods of dolphins where exact number of

individuals is difficult to determine. The Beaufort Sea state has a large impact on the ability to visibly detect many smaller or unobtrusive marine species such as beaked whales and sea turtles. During the Survey, there were several days (15% of all visual monitoring) where Beaufort Sea states (equal to or greater than level four) may have resulted in some missed protected species detections. However, most of all visual monitoring observations throughout the survey program (85%) were conducted during Beaufort Sea states of level three or less, in conditions that are considered favourable for marine mammal detections.

Table 16 describes the behavior of all animals, including unidentified species, which were visually observed within the predicted Level B harassment zones during the survey program. No highly distinctive behavioral reactions observed in relation to the vessel or acoustic source during the survey, although several of the protected species detected were last observed moving away from the vessel.

Table 16: Behaviour of Species Visually Observed inside the Predicted Areas of Sound Pressure Levels of 160 dB or Greater

Species	Detection No.	No. of Animals	Highest Observed Sound Pressure Level (dB)	Initial behavior	Initial direction in relation to vessel	Subsequent and Final behavior	Subsequent and Final direction in relation to vessel
Common Bottlenose Dolphin	1	10	160	Porpoising	Crossing Ahead of Vessel	Diving	Away from Vessel
Common Bottlenose Dolphin	97	2	160	Blowing	Towards Vessel	Swimming	Parallel in Opposite Direction as Vessel
Common Bottlenose Dolphin	131	1	160	Porpoising	Crossing Ahead of Vessel	Porpoising	Away from Vessel
Common Bottlenose Dolphin	137	4	160	Surfacing	Towards Vessel	Diving	Crossing Astern of Vessel
Common Bottlenose Dolphin	143	1	160	Porpoising	Towards Vessel	Porpoising	Towards Vessel
Common Bottlenose Dolphin	145	1	160	Porpoising	Towards Vessel	Diving	Away from Vessel
Common Bottlenose Dolphin	162	4	160	Surfacing	Crossing Ahead of Vessel	Diving	Crossing Ahead of Vessel
Common Bottlenose Dolphin	164	1	160	Porpoising	Parallel in Opposite Direction as Vessel	Porpoising	Parallel in Opposite Direction as Vessel
Common Bottlenose Dolphin	168	1	160	Fast Travel	Crossing Ahead of Vessel	Diving	Towards Vessel
Common Bottlenose Dolphin	175	1	160	Porpoising	Variable	Diving with Flukes	Away from Vessel

Species	Detection No.	No. of Animals	Highest Observed Sound Pressure Level (dB)	Initial behavior	Initial direction in relation to vessel	Subsequent and Final behavior	Subsequent and Final direction in relation to vessel
Common Bottlenose Dolphin	176	5	160	Porpoising	Variable	Diving with Flukes	Crossing Ahead of Vessel
Common Bottlenose Dolphin	182	4	160	Milling	Variable	Diving	Towards Vessel

5.2 Implementation and Effectiveness of Mitigation Protocols

To minimize the potential impacts to marine mammals and sea turtles during the Survey, PSOs were prepared to implement mitigation measures whenever protected species were detected approaching, entering, or within the exclusion zones designated in the OCS-A 0497 lease and IHA.

Mitigation measures in the IHA and OCS-A 0497 lease required:

- Establishment of Exclusion Zones around energy sources with operating frequencies below 200 kHz
 - 500-meter exclusion zone (EZ) for North Atlantic right whales.
 - 200-meter EZ was implemented for Endangered Species Act (ESA) listed animals and turtles.
 - 100-meter EZ was used for non-ESA listed non-delphinoid cetaceans.
 - 50-meter exclusion zone was used for all other marine mammal species.
- Search periods of 60 minutes conducted visually (daytime) or visually and acoustically (all periods of reduced visibility, including night) prior to the initiation of the sound sources from silence
- Delays to the initiation of the sound sources if marine mammals or sea turtles were detected inside their respective exclusion zones during the search period prior to the initiation of the source
- Shut-down of the active source upon detection of marine mammals or sea turtles inside their respective exclusion zones while a sound source with an operating frequency below 200 kHz was active and a subsequent search period of the exclusion zones
- Once the sound source had been shut down for a protected species detection, operations would not resume until a specific time had passed following the last detection of the animal(s) or once the animal had exited the EZ: 15 minutes for small delphinoid cetaceans and pinnipeds, 30 minutes for non-delphinoid cetaceans, 30 minutes for North Atlantic right whales, and 60 minutes for sea turtles.

Throughout the Survey, there were 109 mitigation actions implemented for protected species, including 69 shut downs of the active source and 40 delays to the initiation of the source.

Shut-downs of the active sources were implemented proactively and successfully such that sources were silenced before marine mammals or sea turtles were observed inside the predicted Level A exposure

zones. No marine mammals or sea turtles were observed inside the predicted Level A exposure zones during this survey.

If an injured or dead protected species was discovered during the Survey, and the lead visual observer determined that the cause of death was unknown or unrelated to the activities of the vessel, the incident was to be immediately reported. There were no such observations made during the Survey. If a dead protected species was observed, where the death was determined to be unrelated to the survey activities or where the Lead PSO deemed the death to be old, the carcass would be reported to the NMFS Stranding hotline, to NMFS and to BOEM within 24 hours. Throughout the Survey, there were two sightings of a dead protected species. On 25 August 2018, the carcass of a shelled sea turtle was sighted as the vessel was actively surveying. Due to the presence of scavenging signs and advanced decomposition, the Lead PSO determined that the death was not recent. The sighting was reported to the NMFS Stranding hotline and a written report in the format provided by BOEM in the RAP Approval Conditions, was submitted to BOEM and NMFS. On 04 October 2018, there was a sighting of a probable loggerhead sea turtle carcass that also showed advanced decomposition such that the Lead PSO determined that the death was unlikely to be recent. This observation was also reported to the NMFS Stranding hotline, NMFS and BOEM in a written report.

Passive acoustic monitoring was conducted throughout the survey during hours of reduced visibility, with most of the acoustic monitoring undertaken while the source was active. High levels of background noise on the hydrophone cable were experienced when the vessel traveled at higher speeds (greater than six knots), which made it impractical to conduct monitoring for baseline acoustic data collection while the vessel was in transit to and from the survey site.

A total of 1,627 individual marine mammals from eight species (including five dolphin species, two seal species, and the harbour porpoise) were authorized for takes in the IHA. Of this total, all 1,627 were authorized for Level B takes, with no takes authorized for Level A Harassment. No specific take numbers were authorized for species of sea turtles. During the survey, only 35 protected species were observed within the predicted Level B harassment radius. This total represents 2% of the authorized Level B takes. No protected species was observed within the predicted Level A harassment zone. The species composition of this total, in relation to the total allowed takes is shown in Table 15.

PSOs likely did not detect all animals present, however, it is highly unlikely that the actual number of animals present during survey operations reached anywhere near the fully authorized levels for all species. The combination of conservative predicted mitigation zones combined with conservative take estimation by NMFS (*i.e.*, the precautionary approach), appears for most species to have resulted in an overestimation of take and of overall impact on marine species from the activity.

The monitoring and mitigation measures required by the IHA appear to have been an effective means to protect the marine species encountered during survey operations.

APPENDICES

APPENDIX A:

Incidental Harassment Authorization



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Silver Spring, MD 20910

INCIDENTAL HARASSMENT AUTHORIZATION

Virginia Electric and Power Company, d/b/a Dominion Energy Virginia (Dominion) is hereby authorized under section 101(a)(5)(D) of the Marine Mammal Protection Act (16 U.S.C. 1371(a)(5)(D)) and 50 CFR 216.107, to harass marine mammals incidental to high-resolution geophysical (HRG) survey associated with unexploded ordnance (UXO) investigation activities off the coast of Virginia in the area of the Research Lease of Submerged Lands for Renewable Energy Activities on the Outer Continental Shelf Offshore Virginia (OCS-A 0497) and coastal waters where one or more cable route corridors will be established (the Survey Area) when adhering to the following terms and conditions.

1. This IHA is valid for a period of one year from the date of issuance.
2. This IHA is valid only for UXO survey activities utilizing HRG survey equipment, as specified in the IHA application, in the Atlantic Ocean.
3. General Conditions
 - a) A copy of this IHA must be in the possession of Dominion, the vessel operator and other relevant personnel, the lead PSO, and any other relevant designees of Dominion operating under the authority of this IHA.
 - b) The species authorized for taking are listed in Table 1 (attached). The taking is limited to the species and numbers listed in Table 1. Any taking of species not listed in Table 1, or exceeding the authorized amounts listed, is prohibited and may result in the modification, suspension, or revocation of this IHA.
 - c) The taking by injury, serious injury or death of any species of marine mammal is prohibited and may result in the modification, suspension, or revocation of this IHA.
 - d) Dominion must ensure that the vessel operator and other relevant vessel personnel are briefed on all responsibilities, communication procedures, marine mammal monitoring protocols, operational procedures, and IHA requirements prior to the start of survey activity, and when relevant new personnel join the survey operations.
4. Mitigation Requirements – the holder of this Authorization is required to implement the following mitigation measures:
 - (a) Dominion must use at least four (4) NMFS-approved protected species observers (PSOs) during HRG surveys. The PSOs must have no tasks other than to conduct observational effort, record observational data, and communicate with and



instruct relevant vessel crew with regard to the presence of marine mammals and mitigation requirements. PSO resumes must be provided to NMFS for approval prior to commencement of the survey.

- (b) Visual monitoring must begin no less than 30 minutes prior to initiation of survey equipment and must continue until 30 minutes after use of survey equipment ceases.
- (c) Exclusion Zones and Watch Zone – PSOs must establish and monitor marine mammal Exclusion Zones and Watch Zones. PSOs must monitor a marine mammal Watch Zone that must encompass an area 500 m from the survey equipment to encompass the exclusion zone for North Atlantic right whales. PSOs must document and record the behavior of all marine mammals observed within the Watch Zone. The Exclusion Zones are as follows:
 - (i) a 50-m Exclusion Zone for harbor porpoises;
 - (ii) a 100-m Exclusion Zone for large ESA-listed whales, except North Atlantic right whales (*i.e.*, fin whales); and
 - (iii) a 500-m Exclusion Zone for North Atlantic right whales.
- (d) Shutdown requirements – If a marine mammal is observed within, entering, or approaching the relevant Exclusion Zones as described under 4(c) while geophysical survey equipment is operational, the geophysical survey equipment must be immediately shut down.
 - (i) Any PSO on duty has the authority to call for shutdown of survey equipment. When there is certainty regarding the need for mitigation action on the basis of visual detection, the relevant PSO(s) must call for such action immediately.
 - (ii) If a species for which authorization has not been granted, or, a species for which authorization has been granted but the authorized number of takes have been met, approaches or is observed within 100 m of the survey equipment, shutdown must occur.
 - (iii) When a shutdown is called for by a PSO, the shutdown must occur and any dispute resolved only following shutdown.
 - (iv) Upon implementation of a shutdown, survey equipment may be reactivated when all marine mammals have been confirmed by visual observation to have exited the relevant Exclusion Zone or an additional time period has elapsed with no further sighting of the animal that triggered the shutdown (15 minutes for harbor porpoises and 30 minutes for all other species).

- (v) If geophysical equipment shuts down for reasons other than mitigation (*i.e.*, mechanical or electronic failure) resulting in the cessation of the survey equipment for a period of less than 20 minutes, the equipment may be restarted as soon as practicable if visual surveys were continued diligently throughout the silent period and the relevant Exclusion Zones are confirmed by PSOs to have remained clear of marine mammals during the entire 20-minute period. If visual surveys were not continued diligently during the pause of 20 minutes or less, a 30-minute pre-clearance period must precede the restart of the geophysical survey equipment as described in 4(e). If the period of shutdown for reasons other than mitigation is greater than 20 minutes, a pre-clearance period must precede the restart of the geophysical survey equipment as described in 4(e).
- (e) Pre-clearance observation – 30 minutes of pre-clearance observation must be conducted prior to initiation of geophysical survey equipment. Geophysical survey equipment must not be initiated if marine mammals are observed within or approaching a 200-m radius from the geophysical survey equipment or any relevant Exclusion Zone as described under 4(d) during the pre-clearance period. If a marine mammal is observed within or approaching the relevant Exclusion Zone during the pre-clearance period, geophysical survey equipment must not be initiated until the animal(s) is confirmed by visual observation to have exited the relevant Exclusion Zone or until an additional time period has elapsed with no further sighting of the animal (15 minutes for small cetaceans and pinnipeds and 30 minutes for all other species).
- (f) Ramp-up – when technically feasible, survey equipment must be ramped up at the start or re-start of survey activities. Ramp-up must begin with the power of the smallest acoustic equipment at its lowest practical power output appropriate for the survey. When technically feasible the power must then be gradually turned up and other acoustic sources added in way such that the source level would increase gradually.
- (g) Vessel Strike Avoidance – Vessel operator and crew must maintain a vigilant watch for all marine mammals and slow down or stop the vessel or alter course, as appropriate, to avoid striking any marine mammal, unless such action represents a human safety concern. Survey vessel crew members responsible for navigation duties must receive site-specific training on marine mammal sighting/reporting and vessel strike avoidance measures. Vessel strike avoidance measures must include the following, except under circumstances when complying with these requirements would put the safety of the vessel or crew at risk:
 - (i) The vessel operator and crew must maintain vigilant watch for cetaceans and pinnipeds, and slow down or stop the vessel to avoid striking marine mammals;

- (ii) The vessel operator must reduce vessel speed to 10 kn (18.5 km/hr) or less when any large whale, any mother/calf pairs, whale or dolphin pods, or larger assemblages of non-delphinoid cetaceans are observed near (within 100 m (330 ft)) an underway vessel;
- (iii) The survey vessel must maintain a separation distance of 500 m (1640 ft) or greater from any sighted North Atlantic right whale;
- (iv) If underway, the vessel must steer a course away from any sighted North Atlantic right whale at 10 kn (18.5 km/hr) or less until the 500 m (1640 ft) minimum separation distance has been established. If a North Atlantic right whale is sighted in a vessel's path, or within 100 m (330 ft) to an underway vessel, the underway vessel must reduce speed and shift the engine to neutral. Engines must not be engaged until the North Atlantic right whale has moved outside of the vessel's path and beyond 100 m. If stationary, the vessel must not engage engines until the North Atlantic right whale has moved beyond 100 m;
- (v) The vessel must maintain a separation distance of 100 m (330 ft) or greater from any sighted non-delphinoid cetacean. If sighted, the vessel underway must reduce speed and shift the engine to neutral, and must not engage the engines until the non-delphinoid cetacean has moved outside of the vessel's path and beyond 100 m. If a survey vessel is stationary, the vessel must not engage engines until the non-delphinoid cetacean has moved out of the vessel's path and beyond 100 m;
- (vi) The vessel must maintain a separation distance of 50 m (164 ft) or greater from any sighted delphinoid cetacean. Any vessel underway remain parallel to a sighted delphinoid cetacean's course whenever possible, and avoid excessive speed or abrupt changes in direction. Any vessel underway reduces vessel speed to 10 kn (18.5 km/hr) or less when pods (including mother/calf pairs) or large assemblages of delphinoid cetaceans are observed. Vessels may not adjust course and speed until the delphinoid cetaceans have moved beyond 50 m and/or the abeam of the underway vessel;
- (vii) All vessels underway must not divert or alter course in order to approach any whale, delphinoid cetacean, or pinniped. Any vessel underway must avoid excessive speed or abrupt changes in direction to avoid injury to the sighted cetacean or pinniped;
- (viii) All vessels must maintain a separation distance of 50 m (164 ft) or greater from any sighted pinniped;
- (ix) The vessel operator must comply with 10 kn (18.5 km/hr) or less speed restrictions in any Seasonal Management Area per NMFS guidance;

- (x) If NMFS should establish a Dynamic Management Area (DMA) in the area of the survey, within 24 hours of the establishment of the DMA, Dominion must contact the NMFS Office of Protected Resources to determine whether survey location and/or activities should be altered to avoid North Atlantic right whales; and
- (xi) Between watch shifts, PSOs must consult NMFS' North Atlantic right whale reporting systems for the presence of North Atlantic right whales throughout survey operations.

5. Monitoring Requirements – The Holder of this Authorization is required to conduct marine mammal visual monitoring during geophysical survey activity. Monitoring must be conducted in accordance with the following requirements:

- (a) A minimum of four NMFS-approved PSOs, operating in shifts, must be employed by Dominion during geophysical surveys.
- (b) Observations must take place from the highest available vantage point on the survey vessel. General 360-degree scanning must occur during the monitoring periods, and target scanning by PSOs must occur when alerted of a marine mammal presence.
- (c) PSOs must be equipped with binoculars and have the ability to estimate distances to marine mammals located in proximity to the vessel and/or Exclusion Zones using range finders. Reticulated binoculars must also be available to PSOs for use as appropriate based on conditions and visibility to support the sighting and monitoring of marine species. Digital single-lens reflex camera equipment must be used to record sightings and verify species identification.
- (d) During night surveys, night-vision equipment and infrared technology must be used. Specifications for night-vision and infrared equipment must be provided to NMFS for review and acceptance prior to start of surveys.
- (e) PSOs operators must work in shifts such that no one monitor must work more than 4 consecutive hours without a 2 hour break or longer than 12 hours during any 24-hour period. During daylight hours the PSOs must rotate in shifts of 1 on and 3 off. During ramp-up procedures and nighttime operations PSOs must work in pairs.
- (f) Position data must be recorded using hand-held or vessel global positioning system (GPS) units for each sighting.
- (g) A briefing must be conducted between survey supervisors and crews, PSOs, and Dominion to establish responsibilities of each party, define chains of command,

discuss communication procedures, provide an overview of monitoring purposes, and review operational procedures.

- (h) PSO Qualifications must include direct field experience on a marine mammal observation vessel and/or aerial surveys.
- (i) Data on all PSO observations must be recorded based on standard PSO collection requirements. PSOs must use standardized data forms, whether hard copy or electronic. The following information must be reported:
 - (i) PSO names and affiliations;
 - (ii) Dates of departures and returns to port with port name;
 - (iii) Dates and times (Greenwich Mean Time) of survey effort and times corresponding with PSO effort;
 - (iv) Vessel location (latitude/longitude) when survey effort begins and ends; vessel location at beginning and end of visual PSO duty shifts;
 - (v) Vessel heading and speed at beginning and end of visual PSO duty shifts and upon any line change;
 - (vi) Environmental conditions while on visual survey (at beginning and end of PSO shift and whenever conditions change significantly), including wind speed and direction, Beaufort sea state, Beaufort wind force, swell height, weather conditions, cloud cover, sun glare, and overall visibility to the horizon;
 - (vii) Factors that may be contributing to impaired observations during each PSO shift change or as needed as environmental conditions change (*e.g.*, vessel traffic, equipment malfunctions);
 - (viii) Survey activity information, such as acoustic source power output while in operation, number and volume of airguns operating in the array, tow depth of the array, and any other notes of significance (*i.e.*, pre-ramp-up survey, ramp-up, shutdown, testing, shooting, ramp-up completion, end of operations, streamers, etc.);
 - (ix) If a marine mammal is sighted, the following information should be recorded:
 - (A) Watch status (sighting made by PSO on/off effort, opportunistic, crew, alternate vessel/platform);
 - (B) PSO who sighted the animal;

- (C) Time of sighting;
- (D) Vessel location at time of sighting;
- (E) Water depth;
- (F) Direction of vessel's travel (compass direction);
- (G) Direction of animal's travel relative to the vessel;
- (H) Pace of the animal;
- (I) Estimated distance to the animal and its heading relative to vessel at initial sighting;
- (J) Identification of the animal (*e.g.*, genus/species, lowest possible taxonomic level, or unidentified); also note the composition of the group if there is a mix of species;
- (K) Estimated number of animals (high/low/best);
- (L) Estimated number of animals by cohort (adults, yearlings, juveniles, calves, group composition, etc.);
- (M) Description (as many distinguishing features as possible of each individual seen, including length, shape, color, pattern, scars or markings, shape and size of dorsal fin, shape of head, and blow characteristics);
- (N) Detailed behavior observations (*e.g.*, number of blows, number of surfaces, breaching, spyhopping, diving, feeding, traveling; as explicit and detailed as possible; note any observed changes in behavior);
- (O) Animal's closest point of approach and/or closest distance from the center point of the acoustic source;
- (P) Platform activity at time of sighting (*e.g.*, deploying, recovering, testing, data acquisition, other); and
- (Q) Description of any actions implemented in response to the sighting (*e.g.*, delays, shutdown, ramp-up, speed or course alteration, etc.) and time and location of the action.

6. Reporting – a technical report must be provided to NMFS within 90 days after

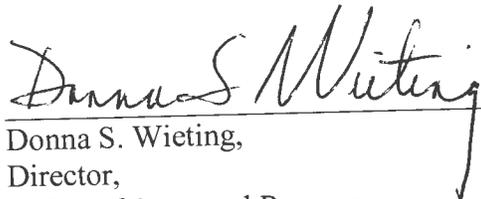
completion of survey activities that fully documents the methods and monitoring protocols, summarizes the data recorded during monitoring, estimates the number of marine mammals that may have been taken during survey activities, describes the effectiveness of the various mitigation techniques and provides an interpretation of the results and effectiveness of all monitoring tasks. Any recommendations made by NMFS must be addressed in the final report prior to acceptance by NMFS.

- (a) Reporting injured or dead marine mammals:
 - (i) In the event that the specified activity clearly causes the take of a marine mammal in a manner not prohibited by this IHA (if issued), such as serious injury or mortality, Dominion must immediately cease the specified activities and immediately report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources ((301) 427-8401) and the NMFS New England/Mid-Atlantic Stranding Coordinator ((978) 282-8478). The report must include the following information:
 - (A) Time, date, and location (latitude/longitude) of the incident;
 - (B) Vessel's speed during and leading up to the incident;
 - (C) Description of the incident;
 - (D) Status of all sound source use in the 24 hours preceding the incident;
 - (E) Water depth;
 - (F) Environmental conditions (*e.g.*, wind speed and direction, Beaufort sea state, cloud cover, and visibility);
 - (G) Description of all marine mammal observations in the 24 hours preceding the incident;
 - (H) Species identification or description of the animal(s) involved;
 - (I) Fate of the animal(s); and
 - (J) Photographs or video footage of the animal(s).

Activities must not resume until NMFS is able to review the circumstances of the prohibited take. NMFS will work with Dominion to determine what measures are necessary to minimize the likelihood of further prohibited take and ensure MMPA compliance. Dominion may not resume their activities until notified by NMFS.

- (ii) In the event that Dominion discovers an injured or dead marine mammal, and the lead PSO determines that the cause of the injury or death is unknown and the death is relatively recent (*e.g.*, in less than a moderate state of decomposition), Dominion must immediately report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources ((301) 427-8401) and the NMFS New England/Mid-Atlantic Stranding Coordinator ((978) 282-8478). The report must include the same information identified in condition 6(b)(i) of this IHA. Activities may continue while NMFS reviews the circumstances of the incident. NMFS will work with Dominion to determine whether additional mitigation measures or modifications to the activities are appropriate.
 - (iii) In the event that Dominion discovers an injured or dead marine mammal, and the lead PSO determines that the injury or death is not associated with or related to the specified activities (*e.g.*, previously wounded animal, carcass with moderate to advanced decomposition, or scavenger damage), Dominion must report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources ((301) 427-8401) and the NMFS New England/Mid-Atlantic Stranding Coordinator ((978) 282-8478). within 24 hours of the discovery. Dominion must provide photographs or video footage or other documentation of the sighting to NMFS.
- 7. This Authorization may be modified, suspended or withdrawn if the holder fails to abide by the conditions prescribed herein, or if NMFS determines the authorized taking is having more than a negligible impact on the species or stock of affected marine mammals.
- 8. On a case-by-case basis, NMFS may issue a second one-year IHA when 1) another year of identical or nearly identical activities is planned or 2) the activities would not be completed by the time the IHA expires and a second IHA would allow for completion of the activities, provided all of the following conditions are met:
 - (a) A request for renewal is received no later than 60 days prior to expiration of the current IHA.
 - (b) The request for renewal must include the following:
 - (i) An explanation that the activities to be conducted beyond the initial dates either are identical to the previously analyzed activities or include changes so minor (*e.g.*, reduction in pile size) that the changes do not affect the previous analyses, take estimates, or mitigation and monitoring requirements.
 - (ii) A preliminary monitoring report showing the results of the required monitoring to date and an explanation showing that the monitoring results do not indicate impacts of a scale or nature not previously analyzed or authorized.

- (c) Upon review of the request for renewal, the status of the affected species or stocks, and any other pertinent information, NMFS determines that there are no more than minor changes in the activities, the mitigation and monitoring measures remain the same and appropriate, and the original findings remain valid.


Donna S. Wieting,
Director,
Office of Protected Resources,
National Marine Fisheries Service.

JUL 3 1 2018

Date

Table 1. Numbers of Incidental Take of Marine Mammals Calculated and Authorized for Level B Harassment.

Species Common Name	Species Scientific Name	Authorized Level B Harassment Take
Bottlenose dolphin – N. Coastal Migratory	<i>Tursiops truncatus</i>	350
Bottlenose dolphin – Offshore	<i>Tursiops truncatus</i>	350
Atlantic spotted dolphin	<i>Stenella frontalis</i>	300
Common dolphin	<i>Delphinus delphis</i>	400
Atlantic white-sided dolphin	<i>Lagenorhynchus acutus</i>	200
Short-finned/long-finned pilot whale	<i>Globicephala macrorhynchus/</i> <i>G. melas</i>	15
Harbor porpoise	<i>Phocoena phocoena</i>	6
Harbor seal	<i>Phoca vitulina</i>	5
Gray seal	<i>Halichoerus grypus</i>	1

APPENDIX B:
Reticle Binocular Calibration Table

Table B- 1: Reticule binocular calibration table

Week #	Date	Observer Name	Big Eye Reticule Distance (m)	Reticule Bino #1	Reticule Bino #2	True Distance from Radar (m)	Sea State (Beaufort)	Wind Force (Beaufort)	Swell (m)
1	2018-08-12	Jeri Butcher	1100			1300	2	14	<2
2	2018-08-20	Jeri Butcher	7500			7000	2	4	<2
3	2018-08-27	Edgar Brunett	1190	1100		1000	2	12	<2
4	2018-09-03	William Habich	1500		1500	1400	1	3	<2
5	2018-09-06	Edgar Brunett	1200	1200		1000	2	5	<2
6	2018-09-23	Heber Huizar	2500	2700		2800	2	12	<2
7	2018-10-01	Heber Huizar	1100	900		900	2	10	<2
8	2018-10-08	Daniela Cuevas	5000	4500		4500	2	4	<2
9	2018-10-15	Eren Penfield	2344	2600		3000	3	13	<2
10	2018-10-22	Eren Penfield	3125	3300		3400	2	7	<2

APPENDIX C: **Night Monitoring Equipment Specifications**

Infrared LED Pistol Grip Spotlight - 15 Hour Runtime - Rechargeable Lithium Ion - 3 Watt

Part #: RL-85-3W1-IR

**Buy American Compliant**

The Larson Electronics RL-85-3W1-IR Infrared LED Pistol Grip Spotlight is an extremely rugged and effective IR spotlight designed to give users in operations requiring infrared illumination a powerful, durable and easy to use source of IR light. This IR spotlight produces an infrared light beam approximately 1,800' long by 175' wide in the 850 to 940 Nm range depending upon configuration, requires no tools for servicing and runs for 15 hours on a single charge.

This light weight, infrared LED spotlight is ergonomically designed to produce a well balanced and easily managed handheld infrared light source that can withstand abuse under tactical conditions and operate for 15 hours on a single charge of its integrated lithium ion battery pack. This light contains a single infrared LED which is paired with a patent pending reflector design to produce an infrared light beam that reaches 1,800 feet in length and 175 feet in width. This beam is strong enough to allow operators to read signs, license plates, addresses and other similar markings at the far end of its total range. This pistol grip spotlight is designed for durability with a handle constructed of high impact nylon and an LED fully potted within a lamp assembly constructed of machined aluminum. The LED lamp assembly is protected by a thick Lexan lens and the integral lithium ion battery pack provides long battery life rated at 1,000's of charge cycles.

This IR spotlight and the materials it is constructed from are water, UV ray, impact and vibration resistant and designed to be easily field serviceable. This unit requires no tools to remove any components and the service factors are accessed through a snap in base at the bottom of the handle.

The Larson Electronics RL-85-3W1-IR handheld infrared spotlight from Larson Electronics was chosen as an Editor's Choice product by Military Embedded Systems Magazine and is featured in the Editors Choice Products column of their July/August 2011 edition.



Lithium Ion Reliability: This pistol grip IR spotlight contains an integral lithium ion battery pack for the highest reliability and durability possible. This unit charges in 2.5 hours and provides 15 hours of runtime when fully charged. The lithium ion batteries used in this unit do not require special charging practices to preserve their effectiveness or longevity and can be recharged when only halfway depleted or only charged to a fraction of their full capacity and will not suffer from degradation or battery memory issues. This means you do not need to wait until the batteries are fully depleted before recharging them, nor do you need to allow them to fully recharge before using the unit. This unit can be partially recharged, used, then the recharging process can be finished later as time allows without any loss of battery life as would happen with NiCad batteries if they were used in this manner. This allows users to use this unit at any time without having to follow complex or highly inconvenient battery charging procedures. Finally, these batteries hold their charge for up to 12 months, allowing users to avoid the need for constant maintenance charging.

Durability-Convenience: The RL-85-3W1-IR Infrared LED Pistol Grip Spotlight contains a single infrared LED that is fully potted within a machined aluminum lamp housing and protected by a thick Lexan lens. This LED has an expected life span of 50,000+ hours and the entire LED lamp housing can be removed and replaced. This light is constructed of UV, water and impact resistant materials including a handle constructed of high impact nylon for extreme durability and resistance to damage from vibrations, shocks and impacts. The machined aluminum lamp housing is finished with an anodized coating for corrosion resistance. 16 gauge wiring is used to connect the internal components and an integral lithium ion battery pack provides 16 hours of runtime and requires 2.5 hours for a full charge. The included universal smart charging unit is compatible with any voltages both domestic and international and plugs into any standard wall outlet. The smart charger that ships with this light operates automatically and will top off the battery and quit once the battery is fully charged, even if the light is left connected to the charger once fully charged.

Versatility: The entire unit weighs only 14 ounces. This light can be ordered in either 850Nm light output configuration for use with older and more common night vision devices or 940Nm light output configuration for use with the latest 4th generation night vision equipment. This light has a 3/8-16 inch brass nut fastener imbedded in the base of the handle to allow mounting this light to a tripod or magnetic base like our MM-2 or MM-5. We also offer permanent mount bases, which can be screwed into the base as well. This unit is fully field serviceable and requires no tools to disassemble or reassemble. This unit is ideal for military, security and law enforcement as well as hunting and any application that requires an extremely durable and effective source of infrared illumination.

Specifications / Additional Information

RL-85-3W1-IR Spotlight

Lamp Type: Infrared LED

Dimensions: 4.5"-L 1.5"-Depth 5/8" W

Weight: 14.Oz

Watts: 3 watts

Voltage: Rechargeable- Universal Smart Charger

Materials: Aluminum - High Impact Nylon

Lamp Life Expectancy: 50,000 Hours

Battery: Lithium Ion

Charge Time: 2.5 Hours

Wavelength: 850 or 940 Nm

Beam Type: Spot

Special Orders- Requirements

Contact us for special requirements

Toll Free: 1-800-369-6671

Intl: 1-903-498-3363

E-mail: sales@larsonelectronics.com

[Scroll Down to Purchase-](#)

Part #: RL-85-3W1-IR (48406)

Options:

RL-85-3W1-IR- IR WAVELENGTH

Example: RL-85-3W1-IR-850

IR WAVELENGTH	
IR850nm	-850
IR940nm	-940
IR750nm	-750









Links (Click on the below items to view):

- [SpecSheet French](#)
- [SpecSheet Arabic](#)
- [SpecSheet Spanish](#)
- [Dimensional Drawing](#)
- [Manual](#)
- [SpectrumChart](#)
- [STEP](#)
- [MSDS](#)
- [DXF](#)
- [Hi-Res Image 1 - Infrared LED Pistol Grip Spotlight](#)
- [Hi-Res Image 2 - Infrared LED Pistol Grip Spotlight](#)
- [Hi-Res Image 3 - Infrared LED Pistol Grip Spotlight](#)
- [Hi-Res Image 4 - Infrared LED Pistol Grip Spotlight](#)
- [Hi-Res Image 5 - Infrared LED Pistol Grip Spotlight](#)
- [Hi-Res Image 6 - Infrared LED Pistol Grip Spotlight](#)
- [Hi-Res Image 7 - Infrared LED Pistol Grip Spotlight](#)
- [Hi-Res Image 8 - Infrared LED Pistol Grip Spotlight](#)

PVS-7 Goggle Generation 3 PINNACLE®

The PVS-7 (PVS-7B/D) is the standard issue goggle type supplied to the U.S. Military and its allies. Equipped with a factory new, high-performance, ITT Generation 3 **PINNACLE®** image intensifier tube, the PVS-7 Gen 3 **PINNACLE®** night vision goggle is designed for the most demanding of night time applications. Battle-proven technology includes Automatic Brightness Control (ABC) which automatically adjusts the brightness of the image tube to achieve the highest quality image resolution under varying light conditions as well as a built-in infra-red illuminator which allows the user to operate under zero light conditions. Lightweight and versatile, the PVS-7 Gen 3 **PINNACLE®** night vision goggle can be hand-held, head-mounted, and helmet-mounted. Standard accessories and System Data Sheet included.



PART #: MVP-MVPVS7-3P

Standard Accessories Included:

- **Head Mount Assembly** – Allows for hands free operation. Accommodates user's head size and eye positioning.
- **Medium & Thick Brow Pads** – Changeable pads.
- **Eye Cups** - Prevents the emission of stray light or facial reflections.
- **Lens Cap**
- **Soft Carrying Case** – Provides convenient storage.
- **Shoulder Strap** – Attaches to the PVS-7 carrying case for easy portability.
- **Lens Paper** – Used to lightly clean the objective and eyepiece glass surfaces.
- **Sacrificial Window**– Shields the optics from sand, air particles or anything that may scratch the lens.
- **Demist Shields** – Snaps onto the eyepiece to prevent condensation from forming on the optics.
- **Operators Manual** - Instructional users guide.
- **Batteries** – Two (2) AA
- **Data Sheet** – System Test Data Sheet

Features and Benefits:

- High resolution 64 lp/mm (Min) **PINNACLE®**, high gain and high photoresponse in visible and near infrared
- Multifunctional: Hand-held, head-mounted or helmet mounted.
- Lightweight only 24 oz w/ batteries
- Equipped with momentary or continuous IR switch
- Automatic high-light cutoff
- Comprehensive two-year warranty

Optional Accessories (not included):

- 3x Mil-Spec Magnifier Lens
- 5x Mil-Spec Magnifier Lens
- Helmet Mount Assembly (PASGT/MICH)
- Sacrificial Window
- Magnetic Compass
- SKB Mil-Standard Hard Case
- And more... (see website)

MOROVISION NIGHT VISION, INC.
23382 Mill Creek Drive, Suite D-115
Laguna Hills, CA 92653

By Phone: Toll Free 1-800-424-8222 or 949-581-9988
By Fax: 949-581-1133
Email: info@morovision.com
Website: <http://www.morovision.com>

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This data sheet is approved for unlimited release. Specifications subject to change without notice.

MORO VISION NIGHT VISION

LIGHT THE NIGHT™



SPECIFICATIONS: PVS-7 Goggle Generation 3 PINNACLE®

Intensifier Tube	Generation	3 U.S. (ITT PINNACLE®)
	Resolution	64 lp/mm (Min)
	Film	Thin
	Gate	Auto-Gated
Optics	Magnification	1x
	Field of View	40 ± 2°
	Objective Lens	F/1.2
	Eyepiece Lens	EFL 26mm
	Diopter Adjustment	+2 to -6 diopters
	Interpupillary Adjustment	55 to 71mm
Range of Focus	20cm to infinity ∞	
Power	Power Source	Two (2) AA size batteries
	Operating Time	Approx. 30 hrs at room temp.
Environmental Characteristics	Operating Temperature	-51° C to +52° C
	Storage Temperature	-51° C to +85° C
Physical Characteristics	Size:	
	Length	6 3/8"
	Height	3"
	Width	6"
	Weight:	
w/batteries	24 oz (680 grams)	
Warranty	System	Two (2) years

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TACS-M™

Rev. 21 Jan 2013

Thermal Acquisition Clip-On System, Miniature

TACS-M shown here on a MUM-14.



Manufactured by
OPTICS 1

SPECIFICATIONS*

Field of View	Boresight Accuracy	Magnification	F Number
20° circular (centered)	3 MOA	1X, optical unity	1.2
Sensor	Spectral Response	Pitch	NEΔT
320 x 240 VOx uncooled LWIR microbolometer	8-12μm	25μm	50mK
Display Brightness	Polarity	Calibration	Display
Adjustable	White hot/black hot	Manual	Kopin (RED)
Range (Clear)	Range (Obscured)	Compatibility	Interface
Detection: 300m Recognition: 260m	Detection: 250m Recognition: 210m	PVS-7, PVS-14, PVS-15, PVS-18, PVS-23, MUM-14	Standard quick connect
Battery Type	Battery Life	Dimensions	Weight
CR123, 3V Lithium, 1ea.	>3.0 hrs (23°C) 2.5 hrs (0°C)	(W x H x L) 38 x 64 x 89mm	166g with battery

*Specifications are subject to change without notice.

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DESCRIPTION

The Miniature Thermal Acquisition Clip-On System (TACS-M) provides the soldier with ultimate performance in technology. Low power consumption, optimal sensor technology, and high-performance optics all seamlessly integrate to provide state of the art long wave infrared (LWIR) technology.

When added to a standard image intensified system, TACS-M provides a second channel with LWIR capability, extending engagement capabilities through obscurants. The TACS-M unit along with Nivisys experience and expertise provides the best value solution for adding low light and no light performance to currently fielded night vision systems.

The unit's waterproof and rugged construction stands up to the harshest environments and features a red display for visual security. This multi-purpose surveillance tool uses the latest in miniature thermal sensor technology and a high resolution display to provide superior imagery in the smallest package available.

For more information on the TACS-M or other Nivisys products call (480) 970-3222 or visit us on the web at www.nivisys.com.

APPENDIX D:

Passive Acoustic Monitoring System Specifications

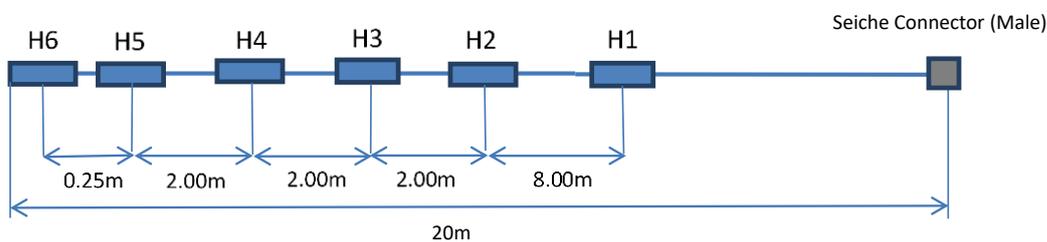
6 Hydrophone Array

230+20m Heavy Tow Array

This sensor array comprises a 20m detachable hydrophone section and a 230m heavy tow cable. The sections are joined with a Seiche connector specifically designed for this application and are fully waterproof. The 20m array section can be interchanged with alternative designs allowing versatility. Longer array sections can also be provided to improve detection and localisation of low frequency vocalising marine mammals.

Mechanical Information

Length	20m
Depth Rating	100m (not connector)
Diameter	14mm over cable. 32mm over mouldings. 45mm over connectors
Weight	20kg
Connector	ITT 19 pin 65mm over connectors



Hydrophone elements

H1 (Low Frequency)	10 Hz to 24 kHz (-3dB points)
H2 (Low Frequency)	10 Hz to 24 kHz (-3dB points)
H3 (Ultra Broadband)	200 Hz to 200 kHz (-3dB points)
H4 (Ultra Broadband)	200 Hz to 200 kHz (-3dB points)
H5 (Broadband)	2 kHz to 200 kHz (-3dB points)
H6 (Broadband)	2 kHz to 200 kHz (-3dB points)

Hydrophone spacing

Spacing H1 - H2 (Low detection)	8.00m
Spacing H3 - H4 (Low-Mid detection)	2.00m
Spacing H5 - H6 (Mid-High detection)	0.25m

Hydrophone sensitivity

Broadband channel sensitivity	-166dB re 1V/ μ Pa (nominal)
Standard channel sensitivity	-157dB re 1V/ μ Pa (nominal)

2.1 Frequency Response Curves

Frequency response curves provide a standard for demonstrating hydrophone sensitivity over a range of frequencies. A flat response between the frequencies of interest is desirable, indicating consistent sensitivity across the band of interest. The frequency response curves provided were generated from 10Hz to 24kHz, 200Hz to 200kHz, and 2kHz to 200kHz hydrophone elements (including pre-amps) of a Seiche towed array and are representative of the response curves for the 6 Hydrophone Array. The frequency response curves for each element within the arrays (main system and spare) used on the survey will be generated as part of the calibration process prior to their dispatch.

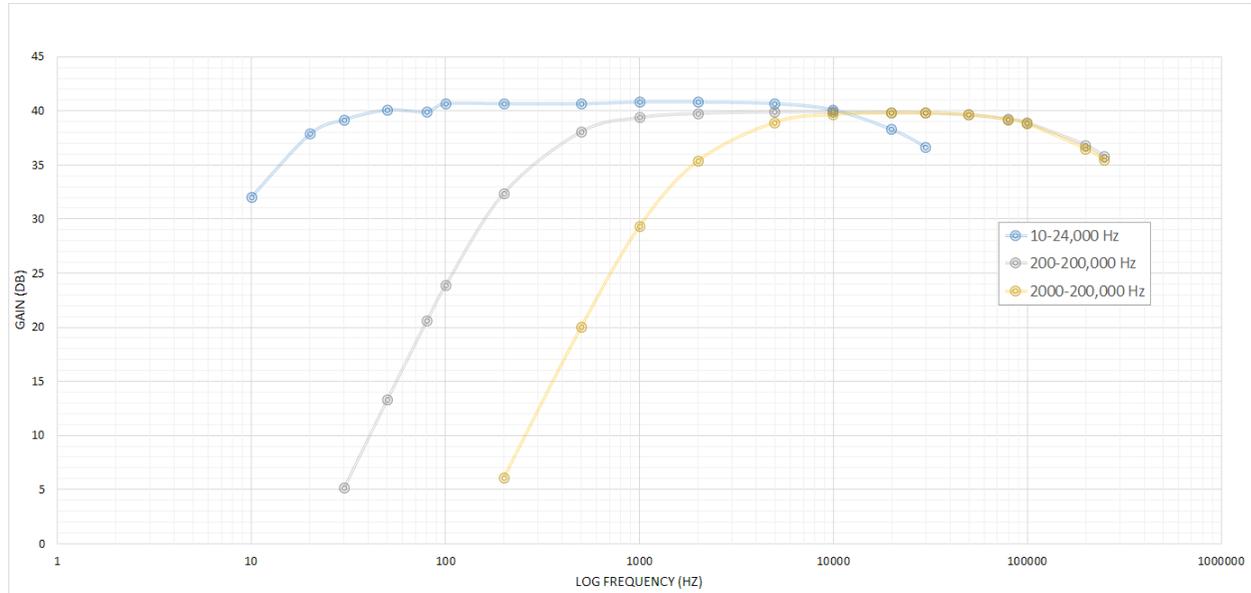


Figure 3 Frequency Response Curve of the Three Types of Hydrophones

APPENDIX E:

PAM Hydrophone Deployment

Survey Deployment

A 250 meter conventionally towed hydrophone cable containing six hydrophone elements and a 100-meter deck cable have been supplied for the Survey. The six hydrophones are positioned along the last 20 meters of the cable. The 100-meter deck cable connects the hydrophone tow cable, which is coiled around the port stern bollard, spooled onto the reels secured on port side of the stern deck, and to the data processing unit (DPU) located in the instrument room (Figure E- 1).



Figure E- 1: PAM monitoring station in the survey room

The hydrophone cable is guided from the secured wooden cable reels on the port stern and coiled around a bollard (Figure E- 2 and Figure E- 3). Upon approach to the survey area, a 10-meter boom arm is deployed off the port stern. The hydrophone cable is secured to the boom arm by a pulley system, which is connected to the hydrophone cable by a Chinese finger (Figure E- 4). The Chinese finger is attached to the cable at the deployment point to prevent excessive strain on the cable or snapping. Pre-measured distances were marked on the hydrophone tow cable at 10-meter increments to assist with accurate deployment in relation to the source locations off the port side of the vessel should a change to hydrophone deployment distances become necessary. During deployment, the hydrophone cable is slowly put out manually from the port stern by two PAM operators. One operator slowly uncoils the hydrophone cable from the bollard while feeding it to the other who ensures proper deployment off the stern. Upon reaching the desired deployment distance, the attachment point is led out to the end of the boom arm by the pulley system so as to avoid entanglement with the side scan sonar (port side) and tow-fish (starboard side) survey equipment (Figure E- 5 Figure 7).



Figure E- 2: Cable reels secured on the port stern of the vessel



Figure E- 3: Tow cable stored on the bollard



Figure E- 4: Chinese finger attached to hydrophone cable tow point leading out to deployment point



Figure E- 5: Fully deployed hydrophone cable

When the tow cable is fully deployed from the *Gerry Bordelon*, the hydrophones are approximately 65 meters from the stern of the vessel, towing at a depth of three to six meters depending on sea current and vessel speed. The hydrophone tow cable is attached to the deck cable with the ITT 19 pin connector. Two foam floats were attached to the hydrophone cable two meters apart and at one meter from the first hydrophone to achieve optimal depth of the towed hydrophone array (Figure E- 6). They were secured with cable-ties and waterproof tape on both ends and the middle.

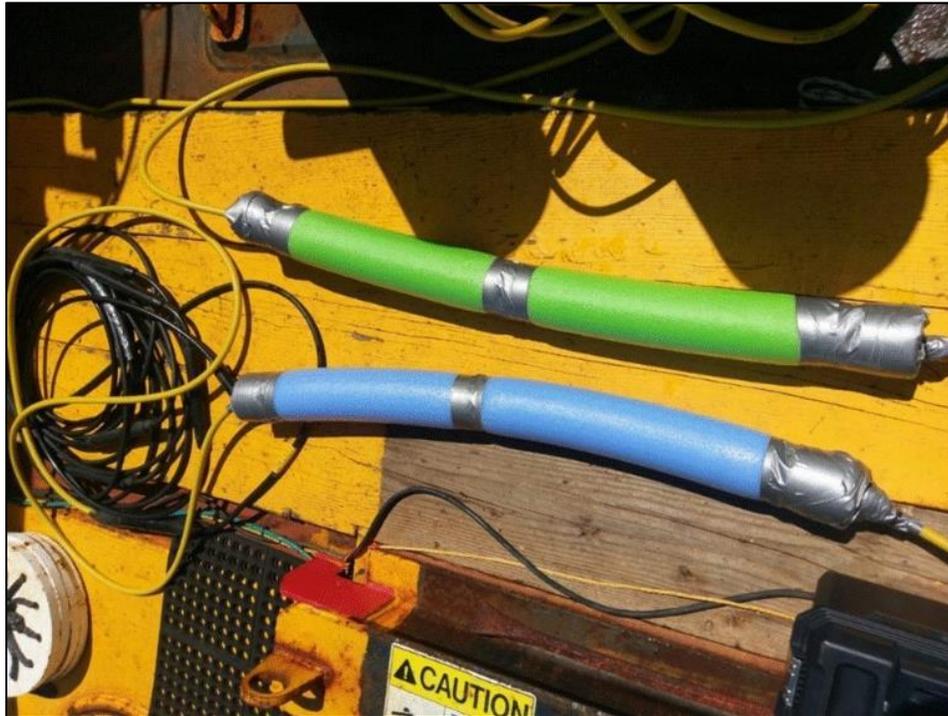


Figure E- 6: Floating tubes attached and secured to the hydrophone cable

APPENDIX F:
**Summary of Visual Detections of Protected
Species during the Survey**

Table F- 1: Summary of Visual Detections of Protected Species during the Survey

Date	Visual Det. No.	Time at first visual sighting	Time at last visual sighting	Detection Cue	Water depth (m)	GIS Latitude	GIS Longitude	Common name	Certainty of Id	Total No. of animals	Initial Behavior	Subsequent behaviors	Range of animals to vessel at first detection	Range of animals to source at first detection	Animal(s) Pace at Initial Detection	Direction of travel at Initial Detection	Range of animals to vessel at last detection	Range of animals to source at last detection	Animal(s) Pace at Final Detection	Direction of travel at Final Detection	Source activity at initial detection	Source activity at final detection	Source mitigation action required
2018-08-09	1	18:38	18:49	Splash	20	36.87263	-075.57493	Common Bottlenose Dolphin	Definite	10	Porpoising	Swimming Diving Breaching/Jumping/Acrobatic Behavior	250	280	Moderate	Crossing Ahead of Vessel	300	325	Vigorous	Away From Vessel	Full Volume While Not On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-08-09	2	20:42	20:44	Body	20	36.94100	-075.55983	Leatherback Sea Turtle	Definite	1	Resting at Surface/Logging	Diving	40	60	Sedate	Crossing Ahead of Vessel	40	60	Sedate	Stationary	Full Volume While Not On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-08-10	3	10:51	10:51	Body	20	36.80569	-075.74868	Leatherback Sea Turtle	Definite	1	Surfacing	Swimming Below Surface	50	70	Sedate	Parallel in Opposite Direction as Vessel	50	60	Sedate	Parallel in Opposite Direction as Vessel	Full Volume While On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-08-10	4	18:30	18:32	Body	20	36.80608	-075.75557	Unidentifiable Shelled Sea Turtle	Definite	1	Surfacing	Swimming Below Surface Resting at Surface/Logging Diving	150	170	Sedate	Parallel in Opposite Direction as Vessel	100	120	Sedate	Away From Vessel	Full Volume While On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-08-10	5	19:12	19:13	Dorsal Fin	51	36.80925	-075.81895	Unidentifiable Dolphin	Definite	2	Porpoising		400	430	Moderate	Crossing Ahead of Vessel	390	420	Moderate	Crossing Ahead of Vessel	Source deployed but silent	Source deployed but silent	None
2018-08-10	6	20:32	20:33	Body	64	36.80925	-075.81895	Unidentifiable Shelled Sea Turtle	Definite	1	Swimming Below Surface		5	25	Sedate	Towards Vessel	5	25	Sedate	Parallel in Opposite Direction as Vessel	Full Volume While Not On Survey Line	Full Volume While Not On Survey Line	Shutdown of Active Source
2018-08-11	7	17:39	17:42	Body	16	36.80017	-075.83913	Unidentifiable Shelled Sea Turtle	Definite	1	Resting at Surface/Logging	Diving	180	211	Sedate	Parallel in Opposite Direction as Vessel	150	180	Sedate	Parallel in Opposite Direction as Vessel	Full Volume While Not On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-08-12	8	17:30	17:42	Splash	13	36.77827	-075.84628	Common Bottlenose Dolphin	Definite	100	Swimming	Porpoising Breaching/Jumping/Acrobatic Behavior Diving	800	830	Moderate	Crossing Ahead of Vessel	400	405	Moderate	Milling	Source deployed but silent	Source deployed but silent	None

Date	Visual Det. No.	Time at first visual sighting	Time at last visual sighting	Detection Cue	Water depth (m)	GIS Latitude	GIS Longitude	Common name	Certainty of Id	Total No. of animals	Initial Behavior	Subsequent behaviors	Range of animals to vessel at first detection	Range of animals to source at first detection	Animal(s) Pace at Initial Detection	Direction of travel at Initial Detection	Range of animals to vessel at last detection	Range of animals to source at last detection	Animal(s) Pace at Final Detection	Direction of travel at Final Detection	Source activity at initial detection	Source activity at final detection	Source mitigation action required
2018-08-12	9	18:50	19:22	Splash	16	36.80217	- 075.81217	Common Bottlenose Dolphin	Definite	90	Swimming	Porpoising Diving Breaching/Jumping/Acrobatic Behavior	1500	1530	Moderate	Crossing Ahead of Vessel	500	500	Moderate	Away From Vessel	Source deployed but silent	Source deployed but silent	None
2018-08-12	10	21:18	21:30	Body	19	36.80867	- 075.82717	Common Bottlenose Dolphin	Definite	25	Swimming	Porpoising	1200	1200	Moderate	Parallel in Opposite Direction as Vessel	1400	1400	Moderate	Crossing Astern of Vessel	Source deployed but silent	Source deployed but silent	None
2018-08-12	11	23:02	23:03	Dorsal Fin	13	36.78317	- 075.84433	Common Bottlenose Dolphin	Definite	25	Swimming		100	110	Moderate	Parallel in Same Direction as Vessel	100	100	Moderate	Parallel in Same Direction as Vessel	Source deployed but silent	Source deployed but silent	None
2018-08-13	12	10:32	10:43	Dorsal Fin	20	36.80050	- 075.85493	Common Bottlenose Dolphin	Definite	8	Surfacing	Milling	200	250	Moderate	Away From Vessel	200	250	Moderate	Milling	Source deployed but silent	Source deployed but silent	None
2018-08-13	13	12:09	12:20	Dorsal Fin	15	36.76597	- 075.83435	Common Bottlenose Dolphin	Definite	30	Surfacing	Swimming Blowing	900	950	Sedate	Crossing Ahead of Vessel	1000	1050	Sedate	Away From Vessel	Source deployed but silent	Source deployed but silent	None
2018-08-13	14	14:15	14:15	Body	16	36.76382	- 075.82946	Loggerhead Sea Turtle	Probable	1	Swimming Below Surface		30	60	Moderate	Towards Vessel	1	15	Moderate	Towards Vessel	Source deployed but silent	Source deployed but silent	None
2018-08-13	15	15:34	15:42	Dorsal Fin	16	36.79433	- 075.82695	Common Bottlenose Dolphin	Definite	60	Swimming	Breaching/Jumping/Acrobatic Behavior	700	730	Moderate	Parallel in Opposite Direction as Vessel	2000	2000	Moderate	Away From Vessel	Source deployed but silent	Source deployed but silent	None
2018-08-13	16	20:40	20:55	Dorsal Fin	17	36.79517	- 075.79763	Common Bottlenose Dolphin	Definite	60	Swimming	Breaching/Jumping/Acrobatic Behavior	200	230	Moderate	Towards Vessel	2000	2000	Moderate	Away From Vessel	Source deployed but silent	Source deployed but silent	None
2018-08-13	17	21:20	21:24	Dorsal Fin	17	36.91412	- 075.94782	Common Bottlenose Dolphin	Definite	10	swimming	Porpoising	500	530	Sedate	Crossing Ahead of Vessel	400	420	Moderate	Parallel in Opposite Direction as Vessel	Source deployed but silent	Source deployed but silent	None

Date	Visual Det. No.	Time at first visual sighting	Time at last visual sighting	Detection Cue	Water depth (m)	GIS Latitude	GIS Longitude	Common name	Certainty of Id	Total No. of animals	Initial Behavior	Subsequent behaviors	Range of animals to vessel at first detection	Range of animals to source at first detection	Animal(s) Pace at Initial Detection	Direction of travel at Initial Detection	Range of animals to vessel at last detection	Range of animals to source at last detection	Animal(s) Pace at Final Detection	Direction of travel at Final Detection	Source activity at initial detection	Source activity at final detection	Source mitigation action required
2018-08-13	18	22:48	22:49	Dorsal Fin	17	36.94993	- 076.00217	Common Bottlenose Dolphin	Definite	1	milling	Porpoising	600	630	Sedate	Milling	500	510	Sedate	Milling	Source deployed but silent	Source deployed but silent	None
2018-08-13	19	23:18	23:23	Splash	12	36.96967	- 076.08700	Common Bottlenose Dolphin	Definite	7	Swimming	Porpoising	130	160	Sedate	Towards Vessel	400	440	Sedate	Parallel in Opposite Direction as Vessel	Source deployed but silent	Source deployed but silent	None
2018-08-13	20	23:41	23:57	Dorsal Fin	13	36.99750	- 076.20150	Common Bottlenose Dolphin	Definite	10	Surfacing	Porpoising	150	180	Sedate	Crossing Ahead of Vessel	5	35	Sedate	Parallel in Opposite Direction as Vessel	Source deployed but silent	Source deployed but silent	None
2018-08-17	21	11:39	11:42	Blow	41	36.93028	- 075.96253	Common Bottlenose Dolphin	Definite	4	Blowing	Swimming	1000	1035	Sedate	Crossing Ahead of Vessel	1200	1235	Sedate	Crossing Ahead of Vessel	Source not deployed	Source not deployed	None
2018-08-17	22	22:05	22:06	carpace	20	36.80602	- 075.73227	Loggerhead Sea Turtle	Definite	1	swimming	Diving	170	200	Sedate	Towards Vessel	100	130	Moderate	Towards Vessel	Full Volume While Not On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-08-20	23	4:11	4:13	Dorsal Fin	20	36.80683	- 075.77483	Unidentifiable Dolphin	Definite		Swimming		250	285	Sedate	Crossing Ahead of Vessel	250	285	Sedate	Crossing Ahead of Vessel	Full Volume While Not On Survey Line	Full Volume While On Survey Line	None
2018-08-20	24	17:24	17:24	Body	17	36.81975	- 075.80108	Unidentifiable Shelled Sea Turtle	Definite		Resting at Surface/Logging	Diving	50	55	sedate	Parallel in Opposite Direction as Vessel	50	55	Sedate	Parallel in Opposite Direction as Vessel	Full Volume While On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-08-20	25	23:10	23:14	Dorsal Fin	14	36.81900	- 075.87417	Unidentifiable Dolphin	Definite		Porpoising	Swimming	300	300	Sedate	Parallel in Opposite Direction as Vessel	600	600	Sedate	Parallel in Opposite Direction as Vessel	Full Volume While Not On Survey Line	Full Volume While Not On Survey Line	None
2018-08-22	26	16:11	16:12	Body	12	36.81750	- 075.88717	Unidentifiable Dolphin	Definite		Swimming		150	150	Moderate	Parallel in Same Direction as Vessel	150	150	Moderate	Away From Vessel	Full Volume While Not On Survey Line	Full Volume While Not On Survey Line	None

Date	Visual Det. No.	Time at first visual sighting	Time at last visual sighting	Detection Cue	Water depth (m)	GIS Latitude	GIS Longitude	Common name	Certainty of Id	Total No. of animals	Initial Behavior	Subsequent behaviors	Range of animals to vessel at first detection	Range of animals to source at first detection	Animal(s) Pace at Initial Detection	Direction of travel at Initial Detection	Range of animals to vessel at last detection	Range of animals to source at last detection	Animal(s) Pace at Final Detection	Direction of travel at Final Detection	Source activity at initial detection	Source activity at final detection	Source mitigation action required
2018-08-22	27	18:18	18:19	Body	15	36.80413	- 075.86732	Unidentifiable Shelled Sea Turtle	Definite		Resting at Surface/Logging	Swimming Diving	180	210	Sedate	Parallel in Opposite Direction as Vessel	180	185	Sedate	Parallel in Opposite Direction as Vessel	Full Volume While Not On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-08-22	28	18:54	18:54	Body	15	36.80733	- 075.82150	Unidentifiable Shelled Sea Turtle	Definite		Resting at Surface/Logging	Diving	100	130	Sedate	Parallel in Opposite Direction as Vessel	100	130	Sedate	Parallel in Opposite Direction as Vessel	Source deployed but silent	Source deployed but silent	Delayed Source Activity
2018-08-23	29	0:44	0:53	Body	21	36.81320	- 075.70977	Unidentifiable Dolphin	Definite		Porpoising	Swimming	5	39	Moderate	Towards Vessel	10	44	Moderate	Towards Vessel	Full Volume While On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-08-23	30	22:53	22:53	Body	17	36.82817	- 075.60483	Loggerhead Sea Turtle	Definite		Resting at Surface/Logging	Milling	70	70	Sedate	Parallel in Opposite Direction as Vessel	70	70	Sedate	Parallel in Opposite Direction as Vessel	Full Volume While Not On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-08-23	31	23:02	23:03	Body	16	36.82033	- 075.59033	Loggerhead Sea Turtle	Definite		Resting at Surface/Logging	Diving	100	135	Sedate	Towards Vessel	100	135	Sedate	Towards Vessel	Full Volume While Not On Survey Line	Source deployed but silent	Delayed Source Activity
2018-08-25	32	11:34	11:39	Dorsal Fin	14	36.81948	- 075.87792	Common Bottlenose Dolphin	Definite		Milling	Feeding	800	800	Sedate	Milling	1200	1200	Sedate	Milling	Full Volume While On Survey Line	Full Volume While On Survey Line	None
2018-08-25	33	12:54	13:03	Dorsal Fin	9	36.81717	- 075.88532	Unidentifiable Dolphin	Definite		Porpoising	Fast Travel Breaching/Jumping/Acrobatic Behavior	500	500	Moderate	Parallel in Opposite Direction as Vessel	2500	2520	Vigorous	Away From Vessel	Full Volume While Not On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-08-25	34	20:53	21:09	Dorsal Fin	16	36.80867	- 075.84500	Common Bottlenose Dolphin	Probable		Swimming	Porpoising Blowing	200	200	Moderate	Crossing Astern of Vessel	350	350	Moderate	Away From Vessel	Full Volume While Not On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-08-26	35	12:31	12:33	Body	20	36.81083	- 075.72333	Leatherback Sea Turtle	Definite	1	Resting at Surface/Logging	Diving	250	300	Sedate	Stationary	100	100	Vigorous	Towards Vessel	Full Volume While On Survey Line	Source deployed but silent	Shutdown of Active Source

Date	Visual Det. No.	Time at first visual sighting	Time at last visual sighting	Detection Cue	Water depth (m)	GIS Latitude	GIS Longitude	Common name	Certainty of Id	Total No. of animals	Initial Behavior	Subsequent behaviors	Range of animals to vessel at first detection	Range of animals to source at first detection	Animal(s) Pace at Initial Detection	Direction of travel at Initial Detection	Range of animals to vessel at last detection	Range of animals to source at last detection	Animal(s) Pace at Final Detection	Direction of travel at Final Detection	Source activity at initial detection	Source activity at final detection	Source mitigation action required
2018-08-26	36	15:38	15:39	Body	17	36.83100	- 075.60867	Leatherback Sea Turtle	Definite	1	Resting at Surface/Logging	Diving	220	270	Sedate	Stationary	220	270	Sedate	Stationary	Full Volume While Not On Survey Line	Full Volume While Not On Survey Line	None
2018-08-26	37	17:30	17:31	Body	17	36.80450	- 075.75900	Loggerhead Sea Turtle	Definite	1	Surfacing	Diving	5	30	Sedate	Crossing Ahead of Vessel	2	30	Sedate	Away From Vessel	Full Volume While Not On Survey Line	Full Volume While Not On Survey Line	Shutdown of Active Source
2018-08-26	38	20:16	20:17	Body	16	36.83000	- 075.60400	Loggerhead Sea Turtle	Definite	1	Resting at Surface/Logging	Diving	12	47	Sedate	Milling	12	47	Sedate	Milling	Full Volume While Not On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-08-27	39	16:13	16:13	Body	17	36.80917	- 075.72783	Loggerhead Sea Turtle	Definite	1	Resting at Surface/Logging		60	80	Sedate	Parallel in Same Direction as Vessel	60	75	Sedate	Parallel in Same Direction as Vessel	Full Volume While On Survey Line	Full Volume While On Survey Line	Shutdown of Active Source
2018-08-27	40	16:43	16:45	Body	20	36.81750	- 075.68083	Loggerhead Sea Turtle	Definite	1	Resting at Surface/Logging	Swimming Diving	40	75	Sedate	Towards Vessel	5	25	Sedate	Towards Vessel	Source deployed but silent	Source deployed but silent	Delayed Source Activity
2018-08-31	41	8:35	8:36	Body	23	36.87433	- 075.52550	Unidentifiable Shelled Sea Turtle	Definite	1	Resting at Surface/Logging	Swimming	50	75	Sedate	Towards Vessel	30	55	Sedate	Parallel in Opposite Direction as Vessel	Full Volume While On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-08-31	42	22:34	22:35	Body	7	36.81670	- 075.95072	Unidentifiable Shelled Sea Turtle	Definite	1	Swimming	Diving	30	20	Vigorous	Parallel in Opposite Direction as Vessel	35	25	Vigorous	Parallel in Opposite Direction as Vessel	Full Volume While On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-09-01	43	4:42	4:44	Dorsal Fin	11	36.81652	- 075.93192	Common Bottlenose Dolphin	Definite		Swimming	Surfacing	50	90	Sedate	Towards Vessel	40	60	Moderate	Parallel in Opposite Direction as Vessel	Full Volume While On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-09-01	44	6:48	6:51	Dorsal Fin	11	36.83877	- 075.95733	Unidentifiable Dolphin	Definite		Surfacing	Porpoising Swimming	150	180	Moderate	Parallel in Opposite Direction as Vessel	100	100	Moderate	Parallel in Opposite Direction as Vessel	Source deployed but silent	Source deployed but silent	Delayed Source Activity

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2018-09-01	45	7:36	7:42	Dorsal Fin	10	36.79804	-075.92628	Unidentifiable Dolphin	Definite		Surfacing	Porpoising Swimming	150	180	Moderate	Crossing Ahead of Vessel	100	100	Moderate	Parallel in Opposite Direction as Vessel	Source deployed but silent	Source deployed but silent	Delayed Source Activity
2018-09-01	46	9:17	9:18	Dorsal Fin	11	36.81600	-075.95750	Unidentifiable Dolphin	Definite		Surfacing	Porpoising Swimming	40	75	Moderate	Towards Vessel	20	55	Moderate	Parallel in Opposite Direction as Vessel	Full Volume While On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-09-01	47	17:26	17:27	Body	24	36.89970	-075.45710	Leatherback Sea Turtle	Definite		Surfacing	Resting at Surface/Logging Diving	40	75	Sedate	Stationary	20	25	Vigorous	Towards Vessel	Full Volume While Not On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-09-01	48	18:14	18:20	Body	24	36.89733	-075.46931	Leatherback Sea Turtle	Definite		Surfacing	Swimming Diving	150	180	Moderate	Away From Vessel	500	500	Moderate	Away From Vessel	Source deployed but silent	Source deployed but silent	Delayed Source Activity
2018-09-02	49	8:56	8:57	Body	21	36.89438	-075.47778	Unidentifiable Shelled Sea Turtle	Definite		Surfacing	Swimming	30	55	Moderate	Parallel in Opposite Direction as Vessel	30	45	Moderate	Parallel in Opposite Direction as Vessel	Full Volume While On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-09-02	50	11:56	11:57	Body	20	36.82450	-075.62867	Unidentifiable Shelled Sea Turtle	Definite		Swimming	Diving	50	50	Moderate	Parallel in Opposite Direction as Vessel	50	40	Moderate	Parallel in Opposite Direction as Vessel	Full Volume While On Survey Line	Full Volume While On Survey Line	Shutdown of Active Source
2018-09-02	51	12:55	12:56	Body	24	36.81817	-075.62767	Loggerhead Sea Turtle	Definite		Surfacing	Swimming	70	70	Moderate	Parallel in Opposite Direction as Vessel	70	70	Moderate	Parallel in Opposite Direction as Vessel	Source deployed but silent	Source deployed but silent	Delayed Source Activity
2018-09-02	52	13:40	13:42	Body	20	36.81100	-075.65050	Loggerhead Sea Turtle	Definite		Swimming	Diving Resting at Surface/Logging	300	320	Sedate	Parallel in Opposite Direction as Vessel	320	300	Sedate	Away From Vessel	Source deployed but silent	Source deployed but silent	None
2018-09-02	53	14:41	14:42	Body	20	36.85667	-075.56267	Loggerhead Sea Turtle	Definite	1	Swimming	Diving	100	130	Moderate	Parallel in Opposite Direction as Vessel	100	80	Moderate	Parallel in Opposite Direction as Vessel	Full Volume While On Survey Line	Source deployed but silent	Shutdown of Active Source

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2018-09-02	54	18:14	18:15	Body	17	36.83951	- 075.59937	Loggerhead Sea Turtle	Definite	1	Swimming	Diving Surfacing Diving	150	150	Moderate	Parallel in Opposite Direction as Vessel	400	425	Moderate	Parallel in Opposite Direction as Vessel	Full Volume While On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-09-02	55	18:53	18:54	Body	18	36.82356	- 075.61719	Leatherback Sea Turtle	Definite	1	Surfacing	Swimming Diving	15	35	Moderate	Parallel in Same Direction as Vessel	10	25	Moderate	Parallel in Same Direction as Vessel	Source deployed but silent	Source deployed but silent	Delayed Source Activity
2018-09-02	56	21:01	21:02	Body	20	36.83472	- 075.60775	Loggerhead Sea Turtle	Definite	1	Surfacing	Diving	100	103	Sedate	Parallel in Opposite Direction as Vessel	100	103	Moderate	Parallel in Opposite Direction as Vessel	Full Volume While On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-09-02	57	22:16	22:17	Body	23	36.89035	- 075.49291	Leatherback Sea Turtle	Definite	1	Surfacing	Swimming Diving	400	400	Moderate	Away From Vessel	400	400	Moderate	Away From Vessel	Source deployed but silent	Source deployed but silent	None
2018-09-03	58	2:03	2:04	Body	27	36.89095	- 075.48582	Leatherback Sea Turtle	Definite		Surfacing	Swimming	5	25	Moderate	Towards Vessel	5	25	Moderate	Towards Vessel	Full Volume While On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-09-03	59	3:30	3:31	Body	24	36.82593	- 075.63177	Unidentifiable shelled sea turtle	Definite		Swimming	Diving	15	20	Vigorous	Parallel in Opposite Direction as Vessel	15	15	Vigorous	Parallel in Opposite Direction as Vessel	Full Volume While Not On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-09-03	60	10:52	10:57	Body	20	36.90137	- 075.48072	Loggerhead Sea Turtle	Definite		Swimming	Swimming Below Surface	300	320	Moderate	Parallel in Opposite Direction as Vessel	300	320	Moderate	Parallel in Opposite Direction as Vessel	Full Volume While On Survey Line	Full Volume While On Survey Line	None
2018-09-03	61	11:17	11:18	Body	20	36.88117	- 075.51067	Loggerhead Sea Turtle	Definite		Swimming Below Surface	Swimming	300	300	Moderate	Parallel in Opposite Direction as Vessel	300	550	Moderate	Parallel in Opposite Direction as Vessel	Full Volume While On Survey Line	Full Volume While On Survey Line	None
2018-09-03	62	11:17	11:19	Body	20	36.88117	- 075.51067	Leatherback Sea Turtle	Definite		Swimming Below Surface	Swimming	500	500	Moderate	Towards Vessel	500	550	Moderate	Away From Vessel	Full Volume While On Survey Line	Full Volume While On Survey Line	None

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2018-09-03	63	12:52	12:53	Body	17	36.83100	- 075.61850	Loggerhead Sea Turtle	Definite		Surfacing	Swimming Resting at Surface/Logging	5	25	Moderate	Parallel in Opposite Direction as Vessel	5	25	Moderate	Parallel in Opposite Direction as Vessel	Full Volume While Not On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-09-03	64	17:10	17:11	Body	19	36.82488	- 075.62710	Loggerhead Sea Turtle	Definite		Surfacing	Diving	75	77	Sedate	Parallel in Opposite Direction as Vessel	75	77	Moderate	Parallel in Opposite Direction as Vessel	Full Volume While Not On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-09-03	65	19:33	19:34	Body	23	35.87860	- 075.51814	Leatherback Sea Turtle	Definite		Surfacing	Swimming Diving	500	510	Sedate	Parallel in Opposite Direction as Vessel	500	510	Sedate	Parallel in Opposite Direction as Vessel	Full Volume While On Survey Line	Full Volume While On Survey Line	None
2018-09-03	66	21:09	21:10	Body	20	36.84500	- 075.58577	Leatherback Sea Turtle	Definite		Surfacing	Diving	40	45	Moderate	Parallel in Opposite Direction as Vessel	40	45	Vigorous	Parallel in Opposite Direction as Vessel	Full Volume While On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-09-03	67	22:03	22:04	Body	17	36.85150	- 075.57320	Leatherback Sea Turtle	Definite	1	Swimming	Diving	10	20	Moderate	Parallel in Opposite Direction as Vessel	10	10	Moderate	Parallel in Opposite Direction as Vessel	Source deployed but silent	Source deployed but silent	Delayed Source Activity
2018-09-04	68	9:56	9:57	Body	19	36.84078	- 075.59650	Unidentifiable Shelled Sea Turtle	Definite	1	Swimming	Diving	175	210	Moderate	Parallel in Opposite Direction as Vessel	175	210	Moderate	Parallel in Opposite Direction as Vessel	Full Volume While On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-09-04	69	10:25	10:26	Body	18	36.85665	- 075.55320	Loggerhead Sea Turtle	Definite	1	Swimming	Resting at Surface/Logging	120	150	Sedate	Parallel in Opposite Direction as Vessel	120	150	Sedate	Parallel in Opposite Direction as Vessel	Source deployed but silent	Source deployed but silent	Delayed Source Activity
2018-09-04	70	10:43	11:08	Dorsal Fin	21	36.86637	- 075.52975	Atlantic Spotted Dolphin	Definite	15	Surfacing	Swimming Diving Swimming Below Surface	4000	4000	Moderate	Towards Vessel	300	330	Moderate	Away From Vessel	Source deployed but silent	Source deployed but silent	None
2018-09-04	71	11:14	11:15	Body	20	36.88602	- 075.48840	Loggerhead Sea Turtle	Definite	1	Resting at Surface/Logging	Surfacing Swimming	90	120	Sedate	Parallel in Opposite Direction as Vessel	90	120	Sedate	Parallel in Opposite Direction as Vessel	Source deployed but silent	Source deployed but silent	Delayed Source Activity

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2018-09-04	72	11:20	11:28	Body	20	36.89018	-075.48760	Leatherback Sea Turtle	Definite	1	Resting at Surface/Logging	Surfacing Swimming	150	180	Sedate	Towards Vessel	150	180	Sedate	Towards Vessel	Source deployed but silent	Source deployed but silent	Delayed Source Activity
2018-09-04	73	11:45	11:46	Body	21	36.90850	-075.46750	Leatherback Sea Turtle	Definite	1	Resting at Surface/Logging	Surfacing Swimming	160	190	Sedate	Parallel in Opposite Direction as Vessel	160	190	Sedate	Parallel in Opposite Direction as Vessel	Source deployed but silent	Source deployed but silent	Delayed Source Activity
2018-09-04	74	12:08	12:09	Body	19	36.84083	-075.57383	Leatherback Sea Turtle	Definite	1	Resting at Surface/Logging	Surfacing Swimming	60	90	Sedate	Parallel in Opposite Direction as Vessel	60	90	Sedate	Parallel in Opposite Direction as Vessel	Source deployed but silent	Source deployed but silent	Delayed Source Activity
2018-09-04	75	15:18	15:20	Body	18	36.84785	-075.58138	Leatherback Sea Turtle	Definite	1	Surfacing	Resting at Surface/Logging Diving	225	220	Sedate	Parallel in Opposite Direction as Vessel	100	105	Moderate	Parallel in Opposite Direction as Vessel	Full Volume While On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-09-04	76	16:11	16:12	Body	18	36.84517	-075.59153	Leatherback Sea Turtle	Definite	1	Surfacing	Diving	100	105	Sedate	Parallel in Opposite Direction as Vessel	75	77	Moderate	Parallel in Opposite Direction as Vessel	Source deployed but silent	Source deployed but silent	Delayed Source Activity
2018-09-04	77	16:42	16:43	Body	18	36.84125	-075.60830	Leatherback Sea Turtle	Definite	1	Surfacing	Resting at Surface/Logging Diving	75	75	Sedate	Parallel in Opposite Direction as Vessel	77	80	Moderate	Parallel in Opposite Direction as Vessel	Source deployed but silent	Source deployed but silent	Delayed Source Activity
2018-09-04	78	17:07	17:09	Body	18	36.83032	-075.61798	Loggerhead Sea Turtle	Definite	1	Surfacing	Swimming Below Surface Diving	40	42	Sedate	Parallel in Same Direction as Vessel	100	102	Vigorous	Parallel in Same Direction as Vessel	Source deployed but silent	Source deployed but silent	Delayed Source Activity
2018-09-04	79	18:32	18:33	Body	25	36.87985	-075.48266	Loggerhead Sea Turtle	Definite	1	Swimming	Diving	700	710	Sedate	Parallel in Opposite Direction as Vessel	700	700	Sedate	Parallel in Opposite Direction as Vessel	Full Volume While On Survey Line	Full Volume While On Survey Line	None
2018-09-04	80	18:38	18:40	Body	25	36.88711	-075.48942	Loggerhead Sea Turtle	Definite	1	Swimming	Diving	750	760	Sedate	Parallel in Opposite Direction as Vessel	750	750	Sedate	Parallel in Opposite Direction as Vessel	Full Volume While On Survey Line	Full Volume While On Survey Line	None

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2018-09-04	81	18:40	18:42	Body	25	36.88711	-075.48942	Leatherback Sea Turtle	Definite	1	Surfacing	Swimming Diving	800	810	Moderate	Towards Vessel	750	760	Moderate	Towards Vessel	Full Volume While On Survey Line	Full Volume While On Survey Line	None
2018-09-04	82	19:00	19:01	Body	23	36.89617	-075.49385	Leatherback Sea Turtle	Definite	1	Surfacing	Swimming Diving	300	320	Moderate	Towards Vessel	100	100	Moderate	Towards Vessel	Full Volume While On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-09-04	83	19:39	19:42	Body	24	36.90643	-075.49084	Leatherback Sea Turtle	Definite	1	Surfacing	Swimming Diving	850	860	Moderate	Crossing Ahead of Vessel	800	810	Moderate	Crossing Ahead of Vessel	Source deployed but silent	Source deployed but silent	None
2018-09-04	84	19:57	19:59	Body	23	36.90396	-075.49356	Leatherback Sea Turtle	Definite	1	Surfacing	Swimming Diving	150	160	Moderate	Parallel in Opposite Direction as Vessel	150	150	Moderate	Parallel in Opposite Direction as Vessel	Source deployed but silent	Source deployed but silent	Delayed Source Activity
2018-09-04	85	20:06	20:08	Body	24	36.89308	-075.49382	Leatherback Sea Turtle	Definite	2	Surfacing	Resting at Surface/Logging Diving	5	7	Sedate	Parallel in Same Direction as Vessel	20	19	Moderate	Parallel in Same Direction as Vessel	Source deployed but silent	Source deployed but silent	Delayed Source Activity
2018-09-04	86	20:57	20:58	Body	27	36.86032	-075.48292	Leatherback Sea Turtle	Definite	1	Surfacing	Resting at Surface/Logging Diving	50	60	Sedate	Parallel in Opposite Direction as Vessel	25	35	Moderate	Parallel in Opposite Direction as Vessel	Source deployed but silent	Source deployed but silent	Delayed Source Activity
2018-09-04	87	21:29	21:30	Body	22	36.91170	-075.48708	Leatherback Sea Turtle	Definite	1	Surfacing	Resting at Surface/Logging Diving	100	100	Sedate	Parallel in Same Direction as Vessel	100	100	Sedate	Parallel in Same Direction as Vessel	Source deployed but silent	Source deployed but silent	Delayed Source Activity
2018-09-04	88	22:36	22:37	Body	23	36.89837	-075.49169	Leatherback Sea Turtle	Definite	1	Surfacing	Swimming Diving	250	250	Sedate	Parallel in Same Direction as Vessel	100	130	Sedate	Parallel in Same Direction as Vessel	Full Volume While Not On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-09-04	89	22:56	22:57	Body	22	36.87035	-075.49208	Leatherback Sea Turtle	Definite	1	Surfacing	Swimming Diving	100	120	Moderate	Away From Vessel	100	100	Moderate	Away From Vessel	Source deployed but silent	Source deployed but silent	Delayed Source Activity

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2018-09-05	90	11:03	11:05	Body	27	36.88270	-075.48283	Leatherback Sea Turtle	Definite	1	Swimming	Surfacing Diving	300	300	Sedate	Parallel in Same Direction as Vessel	300	300	Sedate	Parallel in Same Direction as Vessel	Full Volume While Not On Survey Line	Full Volume While Not On Survey Line	None
2018-09-05	91	11:32	11:34	Body	27	36.88983	-075.50178	Leatherback Sea Turtle	Definite	1	Swimming	Surfacing Diving	150	150	Sedate	Away From Vessel	180	180	Sedate	Away From Vessel	Full Volume While On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-09-05	92	14:23	14:25	Body	26	36.89383	-075.50500	Leatherback Sea Turtle	Definite	1	Swimming	Surfacing Diving	300	325	Sedate	Crossing Ahead of Vessel	150	175	Sedate	Crossing Ahead of Vessel	Full Volume While On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-09-05	93	19:07	19:08	Body	26	36.88830	-075.49603	Leatherback Sea Turtle	Definite	1	Surfacing	Swimming Diving	300	300	Moderate	Parallel in Opposite Direction as Vessel	350	350	Moderate	Parallel in Opposite Direction as Vessel	Full Volume While On Survey Line	Full Volume While On Survey Line	None
2018-09-05	94	19:26	19:27	Body	25	36.88775	-075.50115	Loggerhead Sea Turtle	Definite	1	Swimming Below Surface	Diving	1	15	Vigorous	Away From Vessel	30	30	Vigorous	Away From Vessel	Full Volume While On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-09-05	95	20:36	20:37	Body	27	36.88318	-075.48103	Leatherback Sea Turtle	Definite	1	Surfacing	Swimming Diving	250	255	Sedate	Crossing Ahead of Vessel	225	230	Sedate	Crossing Ahead of Vessel	Full Volume While On Survey Line	Full Volume While On Survey Line	None
2018-09-05	96	21:41	21:45	Body	24	36.87312	-075.48710	Leatherback Sea Turtle	Definite	1	Surfacing	Swimming Diving	300	305	Sedate	Crossing Ahead of Vessel	30	33	Vigorous	Parallel in Opposite Direction as Vessel	Full Volume While On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-09-06	97	1:31	1:32	Blow	26	36.89870	-075.49198	Common Bottlenose Dolphin	Possible	2	Blowing	Swimming	20	55	Sedate	Towards Vessel	5	10	Sedate	Parallel in Opposite Direction as Vessel	Full Volume While On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-09-06	98	3:47	3:50	Dorsal Fin	21	36.87591	-075.48848	Unidentifiable Dolphin	Definite	2	Surfacing	Swimming Swimming Below Surface Bow riding	20	25	Vigorous	Towards Vessel	30	45	Vigorous	Away From Vessel	Full Volume While On Survey Line	Source deployed but silent	Shutdown of Active Source

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2018-09-06	99	5:15	5:16	Body	21	36.88833	-075.49062	Leatherback Sea Turtle	Definite	1	Surfacing	Resting at Surface/Logging Diving	100	130	Moderate	Parallel in Opposite Direction as Vessel	50	40	Moderate	Parallel in Opposite Direction as Vessel	Full Volume While On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-09-06	100	6:10	6:11	Body	21	36.90650	-075.50600	Unidentifiable Shelled Sea Turtle	Definite	1	Resting at Surface/Logging	Surfacing Diving	150	180	Sedate	Parallel in Opposite Direction as Vessel	20	40	Moderate	Parallel in Opposite Direction as Vessel	Source deployed but silent	Source deployed but silent	Delayed Source Activity
2018-09-06	101	6:56	6:57	Body	21	36.92178	-075.49154	Unidentifiable Shelled Sea Turtle	Definite	1	Surfacing	Diving	150	180	Moderate	Parallel in Opposite Direction as Vessel	20	40	Moderate	Parallel in Opposite Direction as Vessel	Source deployed but silent	Source deployed but silent	Delayed Source Activity
2018-09-06	102	11:46	11:48	Body	26	36.88483	-075.49250	Leatherback Sea Turtle	Definite	1	Surfacing	Resting at Surface/Logging Diving	500	500	Sedate	Parallel in Opposite Direction as Vessel	550	550	Sedate	Parallel in Opposite Direction as Vessel	Full Volume While Not On Survey Line	Full Volume While Not On Survey Line	None
2018-09-06	103	15:44	15:45	Body	24	36.88447	-075.49300	Leatherback Sea Turtle	Definite	1	Surfacing	Diving	100	135	Sedate	Crossing Ahead of Vessel	100	135	Sedate	Crossing Ahead of Vessel	Full Volume While On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-09-06	104	17:07	17:08	Body	23	36.92018	-075.49320	Leatherback Sea Turtle	Definite	1	Surfacing	Resting at Surface/Logging Diving	15	15	Sedate	Away From Vessel	15	15	Sedate	Away From Vessel	Full Volume While Not On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-09-06	105	18:19	18:22	Body	25	36.89199	-075.49315	Loggerhead Sea Turtle	Definite	1	Resting at Surface/Logging	Swimming Diving	400	425	Sedate	Parallel in Opposite Direction as Vessel	150	150	Sedate	Parallel in Opposite Direction as Vessel	Full Volume While On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-09-06	106	19:38	19:40	Body	24	36.88330	-075.49299	Leatherback Sea Turtle	Definite	2	Surfacing	Swimming Diving	50	75	Moderate	Parallel in Opposite Direction as Vessel	50	50	Moderate	Parallel in Opposite Direction as Vessel	Full Volume While On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-09-06	107	19:54	19:54	Body	25	36.87950	-075.47820	Loggerhead Sea Turtle	Definite	1	Surfacing	Swimming Below Surface Diving	15	40	Vigorous	Towards Vessel	20	20	Vigorous	Away From Vessel	Source deployed but silent	Source deployed but silent	Delayed Source Activity

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2018-09-07	108	18:39	18:40	Body	25	36.89711	- 075.49327	Leatherback Sea Turtle	Definite		Swimming	Surfacing Diving	700	725	Moderate	Parallel in Same Direction as Vessel	650	650	Moderate	Parallel in Same Direction as Vessel	Full Volume While On Survey Line	Full Volume While On Survey Line	None
2018-09-07	109	19:20	19:21	Body	23	36.88240	- 075.49373	Leatherback Sea Turtle	Definite		Surfacing	Swimming Diving	100	100	Moderate	Parallel in Opposite Direction as Vessel	100	100	Moderate	Parallel in Opposite Direction as Vessel	Full Volume While Not On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-09-07	110	19:25	19:26	Body	23	36.88919	- 075.49336	Green Sea Turtle	Probable		Surfacing	Swimming Below Surface Diving	15	40	Moderate	Towards Vessel	10	10	Vigorous	Parallel in Opposite Direction as Vessel	Source deployed but silent	Source deployed but silent	Delayed Source Activity
2018-09-07	111	19:25	19:26	Body	23	36.88919	- 075.49336	Leatherback Sea Turtle	Definite		Surfacing	Swimming Below Surface Diving	10	35	Moderate	Towards Vessel	10	10	Vigorous	Parallel in Opposite Direction as Vessel	Source deployed but silent	Source deployed but silent	Delayed Source Activity
2018-09-07	112	19:42	19:46	Body	23	36.90827	- 075.48917	Leatherback Sea Turtle	Definite		Resting at Surface/Logging	Diving	150	150	Sedate	Stationary	180	180	Moderate	Away From Vessel	Source deployed but silent	Source deployed but silent	Delayed Source Activity
2018-09-07	113	19:46	19:47	Body	23	36.90217	- 075.48981	Leatherback Sea Turtle	Definite		Surfacing	Swimming Diving	150	175	Moderate	Parallel in Same Direction as Vessel	150	175	Moderate	Parallel in Same Direction as Vessel	Source deployed but silent	Source deployed but silent	Delayed Source Activity
2018-09-08	114	10:25	10:26	Body	21	36.90050	- 075.48950	Leatherback Sea Turtle	Definite		Surfacing	Swimming Diving	110	140	Moderate	Away From Vessel	110	140	Moderate	Away From Vessel	Full Volume While On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-09-08	115	10:37	10:37	Body	21	36.91700	- 075.48800	Leatherback Sea Turtle	Definite		Surfacing	Resting at Surface/Logging Diving	181	211	Sedate	Crossing Ahead of Vessel	181	211	Sedate	Crossing Ahead of Vessel	Source deployed but silent	Source deployed but silent	Delayed Source Activity
2018-09-08	116	16:04	16:06	Body	24	36.87810	- 075.48980	Leatherback Sea Turtle	Definite		Surfacing	Swimming Diving	150	150	Sedate	Parallel in Opposite Direction as Vessel	200	225	Sedate	Parallel in Opposite Direction as Vessel	Full Volume While On Survey Line	Source deployed but silent	Shutdown of Active Source

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2018-09-08	117	17:34	17:35	Body	22	36.90647	-075.49843	Leatherback Sea Turtle	Definite		Surfacing	Swimming Diving	100	115	Sedate	Away From Vessel	100	115	Sedate	Away From Vessel	Source deployed but silent	Source deployed but silent	Delayed Source Activity
2018-09-08	118	17:37	17:42	Body	22	36.90292	-075.49285	Leatherback Sea Turtle	Definite		Surfacing	Swimming Diving	400	415	Sedate	Towards Vessel	90	100	Sedate	Parallel in Opposite Direction as Vessel	Source deployed but silent	Source deployed but silent	Delayed Source Activity
2018-09-08	119	17:50	17:51	Body	22	36.89733	-075.48408	Leatherback Sea Turtle	Definite		Surfacing	Swimming Diving	100	105	Sedate	Away From Vessel	100	105	Sedate	Away From Vessel	Source deployed but silent	Source deployed but silent	Delayed Source Activity
2018-09-08	120	18:02	18:10	Body	23	36.90336	-075.46636	Leatherback Sea Turtle	Definite	1	Surfacing	Resting at Surface/Logging Swimming Diving	50	75	Sedate	Away From Vessel	150	150	Sedate	Away From Vessel	Source deployed but silent	Source deployed but silent	Delayed Source Activity
2018-09-08	121	18:25	18:26	Body	24	36.90103	-075.46366	Leatherback Sea Turtle	Definite	1	Surfacing	Swimming Diving	100	100	Moderate	Parallel in Same Direction as Vessel	150	150	Moderate	Parallel in Same Direction as Vessel	Source deployed but silent	Source deployed but silent	Delayed Source Activity
2018-09-08	122	19:07	19:08	Body	23	36.89879	-075.46868	Leatherback Sea Turtle	Definite	1	Surfacing	Swimming Diving	100	110	Moderate	Towards Vessel	90	100	Moderate	Towards Vessel	Source deployed but silent	Source deployed but silent	Delayed Source Activity
2018-09-08	123	19:47	19:48	Body	24	36.91381	-075.46197	Loggerhead Sea Turtle	Definite	1	Swimming Below Surface	Diving	5	25	Moderate	Parallel in Opposite Direction as Vessel	5	20	Vigorous	Parallel in Opposite Direction as Vessel	Source deployed but silent	Source deployed but silent	Delayed Source Activity
2018-09-08	124	21:42	21:43	Body	18	36.85317	-075.56953	Leatherback Sea Turtle	Definite	1	Surfacing	Swimming Diving	50	65	Sedate	Parallel in Opposite Direction as Vessel	50	65	Sedate	Parallel in Opposite Direction as Vessel	Full Volume While On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-09-20	125	22:34	22:35	Body	14	36.97441	-076.11833	Common Bottlenose Dolphin	Definite	2	Surfacing	Bow riding	300	300	Vigorous	Parallel in Same Direction as Vessel	600	630	Vigorous	Parallel in Same Direction as Vessel	Full Volume While Not On Survey Line	Full Volume While Not On Survey Line	none

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2018-09-21	126	10:02	10:20	Body	8	36.99910	-076.17298	Unidentifiable Dolphin	Definite	1	Porpoising	swimming diving	20	35	sedate	Away From Vessel	100	120	Moderate	Crossing Ahead of Vessel	Source not deployed	Source not deployed	none
2018-09-22	127	12:32	12:33	Body	8	36.83850	-075.94570	Loggerhead Sea Turtle	Possible	1	Surfacing	Diving	80	100	Moderate	Away From Vessel	80	100	Vigorous	Away From Vessel	Full Volume While Not On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-09-23	128	13:22	13:23	Body	24	36.88267	-075.51237	Leatherback Sea Turtle	Definite	1	Surfacing	Diving	100	130	Moderate	Towards Vessel	10	15	Moderate	Parallel in Opposite Direction as Vessel	Full Volume While On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-09-26	129	15:29	15:31	Dorsal Fin	10	36.98630	-076.16578	Common Bottlenose Dolphin	Definite		Porpoising		150	150	Vigorous	Towards Vessel	30	30	Moderate	Towards Vessel	Full Volume While Not On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-09-26	130	15:44	15:47	Splash	13	36.97367	-076.11017	Common Bottlenose Dolphin	Definite		Porpoising	Breaching/Jumping/Acrobatic Behavior	600	600	Vigorous	Away From Vessel	700	700	Vigorous	Away From Vessel	Full Volume While Not On Survey Line	Full Volume While Not On Survey Line	None
2018-09-26	131	16:13	16:15	Dorsal Fin	24	36.95083	-076.02933	Common Bottlenose Dolphin	Definite		Porpoising		30	55	Vigorous	Crossing Ahead of Vessel	200	225	Moderate	Away From Vessel	Full Volume While Not On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-09-26	132	16:59	17:07	Breach	10	36.87150	-075.93783	Common Bottlenose Dolphin	Definite		Porpoising	Milling	70	95	Vigorous	Towards Vessel	500	525	Moderate	Away From Vessel	Full Volume While Not On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-09-26	133	19:06	19:07	Dorsal Fin	11	36.87883	-075.92700	Unidentifiable Dolphin	Definite		Surfacing	Diving	20	45	Moderate	Crossing Astern of Vessel	20	45	Moderate	Crossing Astern of Vessel	Full Volume While Not On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-09-27	134	12:31	12:33	Dorsal Fin	11	36.81888	-075.93675	Common Bottlenose Dolphin	Probable		Fast Travel	Diving Breaching/Jumping/Acrobatic Behavior	300	330	Vigorous	Parallel in Opposite Direction as Vessel	350	370	Vigorous	Away From Vessel	Full Volume While Not On Survey Line	Full Volume While On Survey Line	None

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2018-09-27	135	12:54	12:55	Body	11	36.81920	-075.90327	Loggerhead Sea Turtle	Definite		Surfacing	Swimming Below Surface	80	50	Moderate	Parallel in Opposite Direction as Vessel	75	45	Moderate	Parallel in Opposite Direction as Vessel	Full Volume While On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-09-27	136	13:08	13:11	Dorsal Fin	10	36.81947	-075.87713	Common Bottlenose Dolphin	Definite		Fast Travel	Breaching/Jumping/Acrobatic Behavior Diving	200	230	Vigorous	Parallel in Same Direction as Vessel	300	330	Vigorous	Away From Vessel	Source deployed but silent	Source deployed but silent	None
2018-09-28	137	18:21	18:22	Dorsal Fin	7	36.82483	-075.94267	Common Bottlenose Dolphin	Definite		Surfacing	Diving	5	30	Moderate	Towards Vessel	50	75	Moderate	Crossing Astern of Vessel	Full Volume While Not On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-09-28	138	21:07	21:08	Dorsal Fin	18	36.95832	-076.05945	Common Bottlenose Dolphin	Definite		Porpoising		200	225	Sedate	Crossing Ahead of Vessel	200	225	Sedate	Crossing Ahead of Vessel	Source not deployed	Source not deployed	None
2018-09-28	139	21:13	21:14	Dorsal Fin	15	36.96633	-076.08517	Common Bottlenose Dolphin	Definite		Porpoising		400	400	Sedate	Away From Vessel	400	400	Sedate	Away From Vessel	Source not deployed	Source not deployed	None
2018-09-28	140	21:20	21:21	Dorsal Fin	13	36.97083	-076.09800	Common Bottlenose Dolphin	Definite		Porpoising		300	325	Moderate	Crossing Ahead of Vessel	200	200	Moderate	Crossing Ahead of Vessel	Source not deployed	Source not deployed	None
2018-09-28	141	21:47	21:48	Dorsal Fin	10	36.98933	-076.16817	Common Bottlenose Dolphin	Definite	3	Porpoising		400	400	Moderate	Away From Vessel	400	400	Moderate	Away From Vessel	Source not deployed	Source not deployed	None
2018-09-28	142	21:57	22:52	Dorsal Fin	10	36.99401	-076.18866	Common Bottlenose Dolphin	Definite	11	Porpoising		600	625	Vigorous	Crossing Ahead of Vessel	300	225	Vigorous	Parallel in Opposite Direction as Vessel	Source not deployed	Source not deployed	None
2018-09-29	143	18:39	18:40	Dorsal Fin	21	36.99600	-076.20217	Common Bottlenose Dolphin	Definite	1	Porpoising		25	50	Vigorous	Towards Vessel	1	25	Vigorous	Towards Vessel	Full Volume While Not On Survey Line	Source deployed but silent	Shutdown of Active Source

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2018-09-29	144	19:07	19:09	Dorsal Fin	12	36.97783	-076.12567	Common Bottlenose Dolphin	Definite	1	Porpoising		250	275	Moderate	Crossing Ahead of Vessel	100	100	Moderate	Away From Vessel	Full Volume While Not On Survey Line	Full Volume While Not On Survey Line	None
2018-09-29	145	19:26	19:29	Dorsal Fin	14	36.96567	-076.08233	Common Bottlenose Dolphin	Definite	12	Porpoising	Milling Swimming Diving	75	50	Moderate	Towards Vessel	100	135	Moderate	Away From Vessel	Full Volume While Not On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-09-29	146	20:33	20:36	Dorsal Fin	16	36.90852	-075.91528	Common Bottlenose Dolphin	Definite	10	Porpoising	Swimming Diving	100	125	Moderate	Variable	100	145	Moderate	Away From Vessel	Source deployed but silent	Source deployed but silent	None
2018-09-29	147	21:13	21:24	Dorsal Fin	9	36.87117	-075.80200	Common Bottlenose Dolphin	Definite	20	Porpoising		1000	1000	Vigorous	Crossing Ahead of Vessel	1000	1000	Vigorous	Away From Vessel	Source deployed but silent	Source deployed but silent	None
2018-09-30	148	6:28	6:28	Body	14	36.80918	-075.74220	Unidentifiable Shelled Sea Turtle	Definite		Resting at Surface/Logging	Diving	100	120	Sedate	Parallel in Opposite Direction as Vessel	50	20	Sedate	Parallel in Opposite Direction as Vessel	Full Volume While Not On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-10-01	149	11:25	11:26	Body	12	36.80550	-075.79683	Unidentifiable Shelled Sea Turtle	Definite	1	Swimming	Diving	350	370	Moderate	Parallel in Opposite Direction as Vessel	300	300	Moderate	Parallel in Opposite Direction as Vessel	Full Volume While Not On Survey Line	Full Volume While Not On Survey Line	None
2018-10-01	150	13:48	14:12	Dorsal Fin	9	37.01063	-075.94845	Unidentifiable Dolphin	Definite	4	Swimming	Diving Milling Feeding	1000	1030	Sedate	Parallel in Opposite Direction as Vessel	2000	2030	Sedate	Stationary	Full Volume While Not On Survey Line	Full Volume While Not On Survey Line	None
2018-10-01	151	16:31	16:40	Splash	6	36.80265	-075.95298	Common bottlenose dolphin	Definite	4	Tail or Pectoral Slapping	Porpoising Milling	500	500	Vigorous	Away From Vessel	600	600	Vigorous	Away From Vessel	Full Volume While Not On Survey Line	Full Volume While Not On Survey Line	None
2018-10-01	152	16:24	16:26	Dorsal Fin	6	36.80479	-075.95471	Common bottlenose dolphin	Definite	4	Porpoising		75	100	Vigorous	Towards Vessel	300	300	Vigorous	Parallel in Opposite Direction as Vessel	Full Volume While Not On Survey Line	Full Volume While Not On Survey Line	None

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2018-10-01	153	17:40	17:52	Dorsal Fin	6	36.82491	-075.95683	Common bottlenose dolphin	Definite	8	Porpoising		400	425	Vigorous	Crossing Ahead of Vessel	400	425	Vigorous	Parallel in Opposite Direction as Vessel	Full Volume While Not On Survey Line	Full Volume While Not On Survey Line	None
2018-10-01	154	19:19	19:21	Blow	7	36.81108	-075.95576	Melon-headed Whale	Probable	5	Blowing	Surfacing Milling Porpoising	600	600	Moderate	Parallel in Opposite Direction as Vessel	900	900	Moderate	Parallel in Opposite Direction as Vessel	Full Volume While On Survey Line	Full Volume While On Survey Line	None
2018-10-02	155	11:25	11:30	Dorsal Fin	9	36.81450	-075.95150	Common bottlenose dolphin	Definite	4	Milling	Swimming	500	500	Moderate	Parallel in Same Direction as Vessel	500	520	Moderate	Parallel in Same Direction as Vessel	Full Volume While On Survey Line	Full Volume While On Survey Line	None
2018-10-02	156	13:05	13:09	Dorsal Fin	9	36.81812	-075.90980	Common bottlenose dolphin	Probable	8	Swimming	Diving	800	830	Moderate	Parallel in Opposite Direction as Vessel	500	530	Moderate	Away From Vessel	Full Volume While On Survey Line	Full Volume While On Survey Line	None
2018-10-02	157	15:37	15:39	Dorsal Fin	7	36.85532	-075.96370	Common bottlenose dolphin	Definite	2	Porpoising		100	100	Vigorous	Parallel in Opposite Direction as Vessel	250	250	Vigorous	Parallel in Opposite Direction as Vessel	Full Volume While Not On Survey Line	Full Volume While Not On Survey Line	None
2018-10-02	158	15:43	15:45	Dorsal Fin	7	36.85425	-075.95443	Common bottlenose dolphin	Definite	3	Porpoising		100	100	Vigorous	Parallel in Opposite Direction as Vessel	200	200	Vigorous	Parallel in Opposite Direction as Vessel	Full Volume While Not On Survey Line	Full Volume While Not On Survey Line	None
2018-10-02	159	15:56	15:58	Dorsal Fin	7	36.84733	-075.95228	Common bottlenose dolphin	Definite	4	Porpoising		150	150	Vigorous	Parallel in Opposite Direction as Vessel	300	300	Vigorous	Parallel in Opposite Direction as Vessel	Full Volume While Not On Survey Line	Full Volume While Not On Survey Line	None
2018-10-02	160	16:06	16:19	Dorsal Fin	6	36.83205	-075.94560	Common bottlenose dolphin	Definite	10	Porpoising	Breaching/Jumping/Aerobic Behavior	100	100	Vigorous	Parallel in Same Direction as Vessel	500	500	Vigorous	Variable	Full Volume While Not On Survey Line	Full Volume While Not On Survey Line	None
2018-10-02	161	17:07	17:08	Dorsal Fin	7	36.83977	-075.93840	Common bottlenose dolphin	Definite	1	Porpoising		300	300	Sedate	Away From Vessel	400	400	Sedate	Away From Vessel	Full Volume While Not On Survey Line	Full Volume While Not On Survey Line	None

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2018-10-02	162	19:05	19:05	Dorsal Fin	7	36.83251	-075.94708	Common bottlenose dolphin	Definite	4	Surfacing	Diving	5	30	Moderate	Crossing Ahead of Vessel	5	30	Moderate	Crossing Ahead of Vessel	Full Volume While Not On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-10-03	163	11:01	11:08	Body	12	36.81927	-075.88840	Common bottlenose dolphin	Definite	4	Fast Travel	Breaching/Jumping/Aerobic Behavior	1000	1000	Vigorous	Parallel in Opposite Direction as Vessel	1000	1000	Vigorous	Parallel in Opposite Direction as Vessel	Full Volume While On Survey Line	Full Volume While Not On Survey Line	None
2018-10-03	164	14:25	14:28	Dorsal Fin	8	36.81550	-075.94600	Common bottlenose dolphin	Definite	3	Porpoising		40	40	Moderate	Parallel in Opposite Direction as Vessel	400	420	Moderate	Parallel in Opposite Direction as Vessel	Full Volume While Not On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-10-03	165	17:25	17:28	Dorsal Fin	7	36.80502	-075.94958	Common bottlenose dolphin	Definite	10	Porpoising		300	300	Sedate	Away From Vessel	500	500	Sedate	Away From Vessel	Full Volume While Not On Survey Line	Full Volume While Not On Survey Line	None
2018-10-05	166	13:13	13:34	Dorsal Fin	10	36.81750	-075.95132	Common bottlenose dolphin	Definite		Swimming	Diving Tail or Pectoral Slapping Feeding	150	180	Moderate	Towards Vessel	2500	2530	Moderate	Away From Vessel	Full Volume While Not On Survey Line	Full Volume While On Survey Line	None
2018-10-06	167	15:29	15:31	Dorsal Fin	10	36.81687	-075.91633	Common bottlenose dolphin	Definite		Porpoising		300	325	Moderate	Away From Vessel	150	150	Moderate	Away From Vessel	Full Volume While Not On Survey Line	Full Volume While Not On Survey Line	None
2018-10-07	168	14:29	15:01	Dorsal Fin	9	36.81900	-075.94700	Common Bottlenose Dolphin	Definite	4	Fast Travel	Diving Feeding	100	125	Moderate	Crossing Ahead of Vessel	50	30	Moderate	Towards Vessel	Full Volume While Not On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-10-07	169	15:46	15:47	Dorsal Fin	9	36.80408	-075.94773	Common Bottlenose Dolphin	Definite	1	Porpoising		300	300	Sedate	Away from Vessel	300	300	Sedate	Away from Vessel	Full Volume While Not On Survey Line	Full Volume While Not On Survey Line	None
2018-10-07	170	16:24	16:28	Dorsal Fin	9	36.80700	-075.94730	Common Bottlenose Dolphin	Definite	1	Porpoising		70	95	Moderate	Crossing Ahead of Vessel	200	200	Moderate	Crossing Ahead of Vessel	Full Volume While Not On Survey Line	Full Volume While Not On Survey Line	None

Date	Visual Det. No.	Time at first visual sighting	Time at last visual sighting	Detection Cue	Water depth (m)	GIS Latitude	GIS Longitude	Common name	Certainty of Id	Total No. of animals	Initial Behavior	Subsequent behaviors	Range of animals to vessel at first detection	Range of animals to source at first detection	Animal(s) Pace at Initial Detection	Direction of travel at Initial Detection	Range of animals to vessel at last detection	Range of animals to source at last detection	Animal(s) Pace at Final Detection	Direction of travel at Final Detection	Source activity at initial detection	Source activity at final detection	Source mitigation action required
2018-10-08	171	19:29	19:33	Splash	7	36.81713	-075.92294	Common bottlenose dolphin	Definite		Breaching/Jumping/Acrobatic Behaviour	Porpoising Fast Travel Diving	400	430	Vigorous	Away From Vessel	300	330	Vigorous	Away From Vessel	Full Volume While Not On Survey Line	Full Volume While On Survey Line	None
2018-10-09	172	13:15	13:18	Body	9	36.81562	-075.95073	Unidentifiable Shelled Sea Turtle	Definite		Surfacing	Swimming Diving	90	95	Sedate	Parallel in Opposite Direction as Vessel	80	85	Sedate	Parallel in Opposite Direction as Vessel	Full Volume While Not On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-10-13	173	19:59	20:13	Dorsal Fin	13	36.86600	-075.90000	Common bottlenose dolphin	Definite	20	Porpoising	Fast Travel Breaching/Jumping/Acrobatic Behavior	70	95	Moderate	Crossing Ahead of Vessel	35	35	Moderate	Crossing Astern of Vessel	Source not deployed	Source not deployed	None
2018-10-14	174	15:00	15:39	Dorsal Fin	10	36.81333	-075.89267	Common bottlenose dolphin	Definite		Porpoising	Swimming Blowing Diving with Flukes/Fluking	70	70	Moderate	Variable	2000	2000	Moderate	Parallel in Opposite Direction as Vessel	Full Volume While Not On Survey Line	Full Volume While Not On Survey Line	None
2018-10-14	175	16:00	16:24	Dorsal Fin	7	36.81817	-075.92567	Common bottlenose dolphin	Definite		Porpoising	Swimming Blowing Diving with Flukes/Fluking	2000	2000	Moderate	Variable	50	25	Moderate	Away From Vessel	Full Volume While On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-10-14	176	17:05	17:14	Dorsal Fin	7	36.81683	-075.94817	Common bottlenose dolphin	Definite		Porpoising	Swimming Blowing Diving with Flukes/Fluking	700	700	Moderate	Variable	15	40	Moderate	Crossing Ahead of Vessel	Full Volume While Not On Survey Line	Source deployed but silent	Shutdown of Active Source
2018-10-14	177	17:42	17:47	Dorsal Fin	7	36.81317	-075.94983	Common bottlenose dolphin	Definite		Porpoising	Swimming Diving with Flukes/Fluking	400	400	Moderate	Parallel in Opposite Direction as Vessel	400	400	Moderate	Parallel in Opposite Direction as Vessel	Full Volume While Not On Survey Line	Full Volume While Not On Survey Line	None
2018-10-14	178	18:18	18:21	Dorsal Fin	7	36.81903	-075.94802	Common bottlenose dolphin	Definite		Porpoising	Swimming Blowing Diving with Flukes/Fluking	100	100	Moderate	Parallel in Opposite Direction as Vessel	100	100	Moderate	Towards Vessel	Full Volume While Not On Survey Line	Full Volume While Not On Survey Line	None
2018-10-14	179	21:36	21:36	Dorsal Fin	6	36.81083	-075.94650	Common bottlenose dolphin	Definite		Porpoising	Swimming	140	170	Moderate	Crossing Ahead of Vessel	140	170	Moderate	Away From Vessel	Full Volume While Not On Survey Line	Full Volume While Not On Survey Line	None

Date	Visual Det. No.	Time at first visual sighting	Time at last visual sighting	Detection Cue	Water depth (m)	GIS Latitude	GIS Longitude	Common name	Certainty of Id	Total No. of animals	Initial Behavior	Subsequent behaviors	Range of animals to vessel at first detection	Range of animals to source at first detection	Animal(s) Pace at Initial Detection	Direction of travel at Initial Detection	Range of animals to vessel at last detection	Range of animals to source at last detection	Animal(s) Pace at Final Detection	Direction of travel at Final Detection	Source activity at initial detection	Source activity at final detection	Source mitigation action required
2018-10-16	180	20:45	21:10	Dorsal Fin	11	36.99867	-076.21517	Common Bottlenose Dolphin	Definite	35	Porpoising	Swimming Diving with Flukes/Fluking Blowing	30	60	Moderate	Towards Vessel	500	500	Moderate	Away From Vessel	Source not deployed	Source not deployed	None
2018-10-17	181	12:00	12:10	Splash	10	36.80258	-075.95235	Common Bottlenose Dolphin	Definite	10	Porpoising	Swimming Milling Breaching/Jumping/Aerobic Behavior	500	530	Moderate	Variable	500	530	Moderate	Parallel in Same Direction as Vessel	Full Volume While Not On Survey Line	Full Volume While Not On Survey Line	None
2018-10-17	182	14:12	14:15	Dorsal Fin	9	36.81567	-075.92450	Common Bottlenose Dolphin	Definite	8	Milling	Swimming Tail or Pectoral Slapping Diving	500	530	Vigorous	Variable	10	30	Moderate	Towards Vessel	Full Volume While Not On Survey Line	Full Volume While Not On Survey Line	Shutdown of Active Source
2018-10-17	183	20:10	20:10	Body	17	36.85517	-075.56750	Loggerhead sea turtle	Probable	1	Resting at Surface/Logging	Diving	300	330	Sedate	Crossing Ahead of Vessel	300	330	Sedate	Crossing Ahead of Vessel	Full Volume While On Survey Line	Full Volume While On Survey Line	None
2018-10-17	184	21:51	21:51	Body	21	36.87167	-075.52583	Loggerhead sea turtle	Probable	1	Resting at Surface/Logging	Diving	1000	1000	Sedate	Parallel in Opposite Direction as Vessel	1000	1000	Sedate	Parallel in Opposite Direction as Vessel	Full Volume While Not On Survey Line	Full Volume While Not On Survey Line	None
2018-10-19	185	13:31	13:33	Body	20	36.87172	-075.53270	Leatherback sea turtle	Definite		Surfacing	Swimming Resting at Surface/Logging Diving	180	182	Moderate	Parallel in Opposite Direction as Vessel	180	182	Sedate	Parallel in Opposite Direction as Vessel	Source deployed but silent	Source deployed but silent	None
2018-10-19	186	21:19	21:19	Body	22	36.88100	-075.50900	Loggerhead sea turtle	Definite		Resting at Surface/Logging	Diving	230	255	Sedate	Parallel in Opposite Direction as Vessel	230	255	Sedate	Parallel in Opposite Direction as Vessel	Full Volume While Not On Survey Line	Full Volume While Not On Survey Line	None
2018-10-22	187	15:33	15:33	Body	20	36.81050	-075.74300	Leatherback sea turtle	Definite		Surfacing	Swimming Below Surface Diving	15	45	Sedate	Crossing Ahead of Vessel	15	45	Sedate	Crossing Ahead of Vessel	Source not deployed	Source not deployed	None
2018-10-22	188	17:07	17:07	Body	20	36.85200	-075.56850	Loggerhead sea turtle	Definite		Surfacing	Resting at Surface/Logging Diving	150	175	Sedate	Crossing Ahead of Vessel	150	175	Sedate	Crossing Ahead of Vessel	Source not deployed	Source not deployed	Delayed Source Activity

Date	Visual Det. No.	Time at first visual sighting	Time at last visual sighting	Detection Cue	Water depth (m)	GIS Latitude	GIS Longitude	Common name	Certainty of Id	Total No. of animals	Initial Behavior	Subsequent behaviors	Range of animals to vessel at first detection	Range of animals to source at first detection	Animal(s) Pace at Initial Detection	Direction of travel at Initial Detection	Range of animals to vessel at last detection	Range of animals to source at last detection	Animal(s) Pace at Final Detection	Direction of travel at Final Detection	Source activity at initial detection	Source activity at final detection	Source mitigation action required
2018-10-22	189	18:08	18:09	Body	16	36.87617	-075.45617	Leatherback sea turtle	Definite		Surfacing	Resting at Surface/Logging Diving	225	250	Sedate	Parallel in Opposite Direction as Vessel	25	25	Sedate	Towards Vessel	Source not deployed	Source not deployed	Delayed Source Activity

APPENDIX G:
**Summary of Acoustic Detections of
Protected Species during the Survey**

Table G- 1: Summary of Acoustic Detections during the Survey

Record No.	Date	Time (UTC)	Species	Group Size	Vessel Position	Source Activity Initial Detection	Acoustic Detection Details	CPA Source / Source Activity	Mitigation Action	Comments
AD1	2018-08-23	00:57	Unidentifiable Dolphin	9	36.81320°N 075.70977°W	Innomar USBL	Click trains	None	Shut-down	Correlated detection with visual detection 29
AD2	2018-08-31	03:05	Unidentifiable Dolphin	2	36.82430°N 075.64520°W	None	Click trains and tonal sounds	100m/ Innomar USBL	none	Uncorrelated. Sources already silent due to lightning shut-down.
AD3	09-01-2018	04:44	Bottlenose dolphins	6	36°48.99'N 75°55.91'W	Innomar USBL	Click trains and tonal sounds	70m/ Innomar USBL	Shut-down	Correlated with visual detection 43.
AD4	09-01-2018	05:15	Unidentified dolphins	2	36°48.13'N 75°55.98'W	None	Click trains	100m/ Innomar USBL	Delay	Uncorrelated.
AD5	09-01-2018	05:49	Unidentified dolphins	2	36°50.82'N 75°55.29'W	None	Click trains	100m/ Innomar USBL	Delay	Uncorrelated.
AD6	09-01-2018	06:43	Unidentified dolphins	3	36°50.32'N 75°57.44'W	None	Click trains and tonal sounds	100m/ None	Delay	Correlated with visual detection 44.
AD7	09-01-2018	07:36	Unidentified dolphins	3	36°47.88°N 75°55.57'W	None	Click trains and tonal sounds	100m/ None	Delay	Correlated with visual detection 45.
AD8	09-01-2018	09:18	Unidentifiable Dolphin	6	36°48.96'N 75°57.45W	Innomar USBL	Click trains and tonal sounds	20m/ Innomar USBL	Shut-down	Production loss associated with acoustic detections is reflected in value calculated for visual detections 43-46.
AD9	10-06-2018	06:07	Unidentified dolphins	4	36°48.272'N 75°47.492'W	Innomar and USBL	Up and down whistles	500m/ Innomar and USBL	None	Uncorrelated.

APPENDIX H:
**Photographs of Identified Protected
Species Visually Detected during the
Survey**



Figure H- 1: Visual Detection #08 – Pod of common bottlenose dolphins



Figure H- 2: Visual Detection #14 - Loggerhead Sea Turtle



Figure H- 3: Visual Detection #17 - Common Bottlenose Dolphins



Figure H- 4: Visual Detection #56 - Loggerhead Sea Turtle



Figure H- 5: Visual Detection #69 - Atlantic Spotted Dolphin



Figure H- 6: Visual Detection #82 - Leatherback Sea Turtle



Figure H- 7: Visual Detection #85 - Leatherback Sea Turtle



Figure H- 8: Visual Detection #86 - Leatherback Sea Turtle



Figure H- 9: Visual Detection #103 - Leatherback Sea Turtle



Figure H- 10: Visual Detection #106 - Green Sea Turtle



Figure H- 11: Visual Detection #116 - Leatherback Sea Turtle



Figure H- 12: Visual Detection #120 - Leatherback Sea Turtle



Figure H- 13: Visual Detection #127 - Common Bottlenose Dolphins



Figure H- 14: Visual Detection #153 - Melon-headed Whales

APPENDIX I:
**Screenshots Taken during Acoustic
Detections of Protected Species during
Survey**

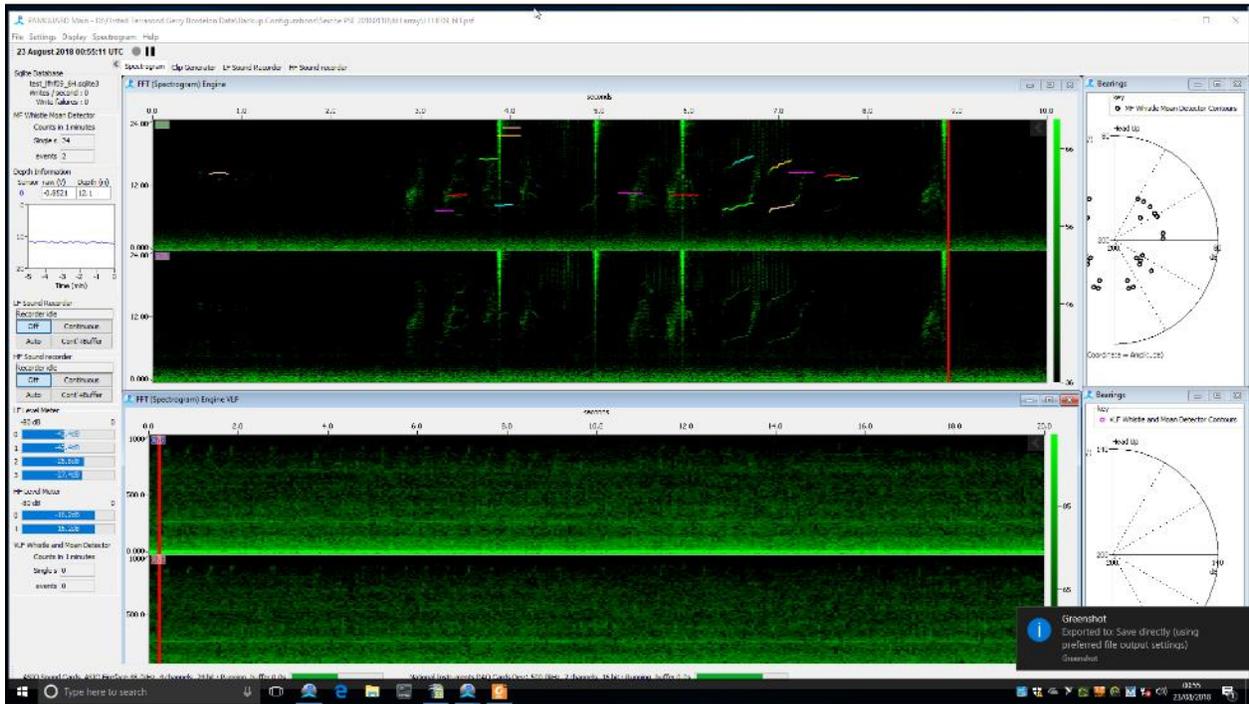


Figure I- 1: Acoustic Detection #01 - UNID delphinid whistles as soon on the Panguard Spectrogram

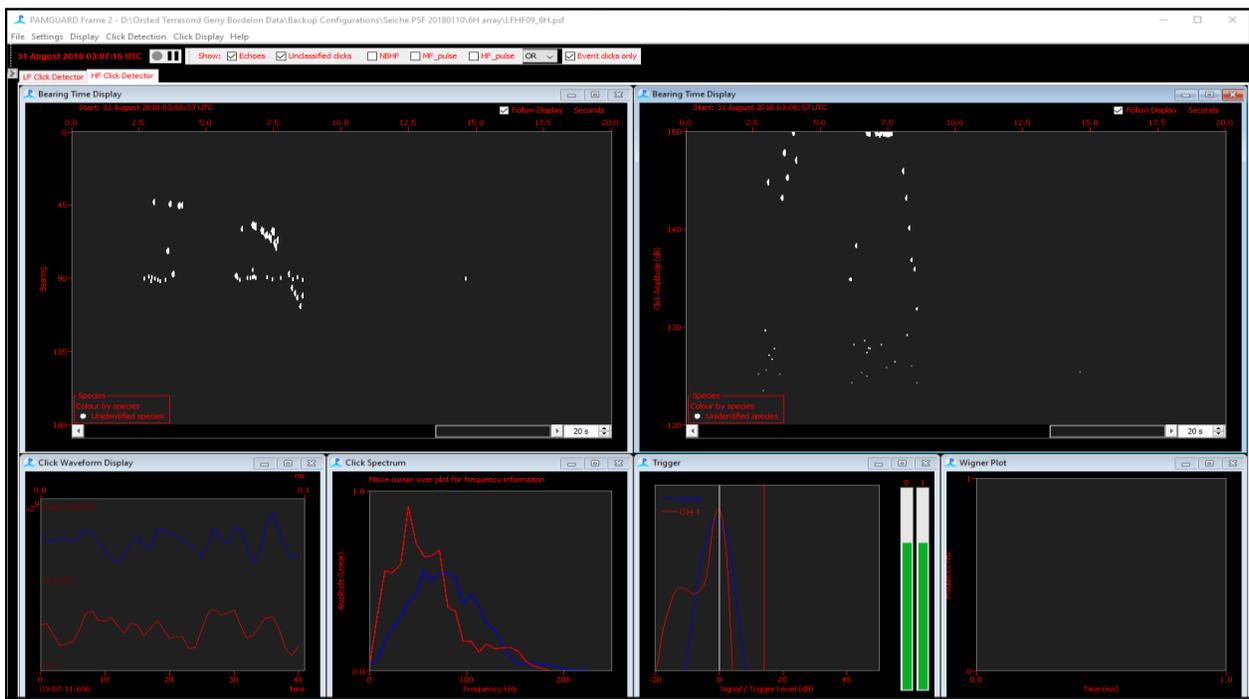


Figure I- 2: Acoustic Detection #02 - High frequency clicks of UNID dolphins

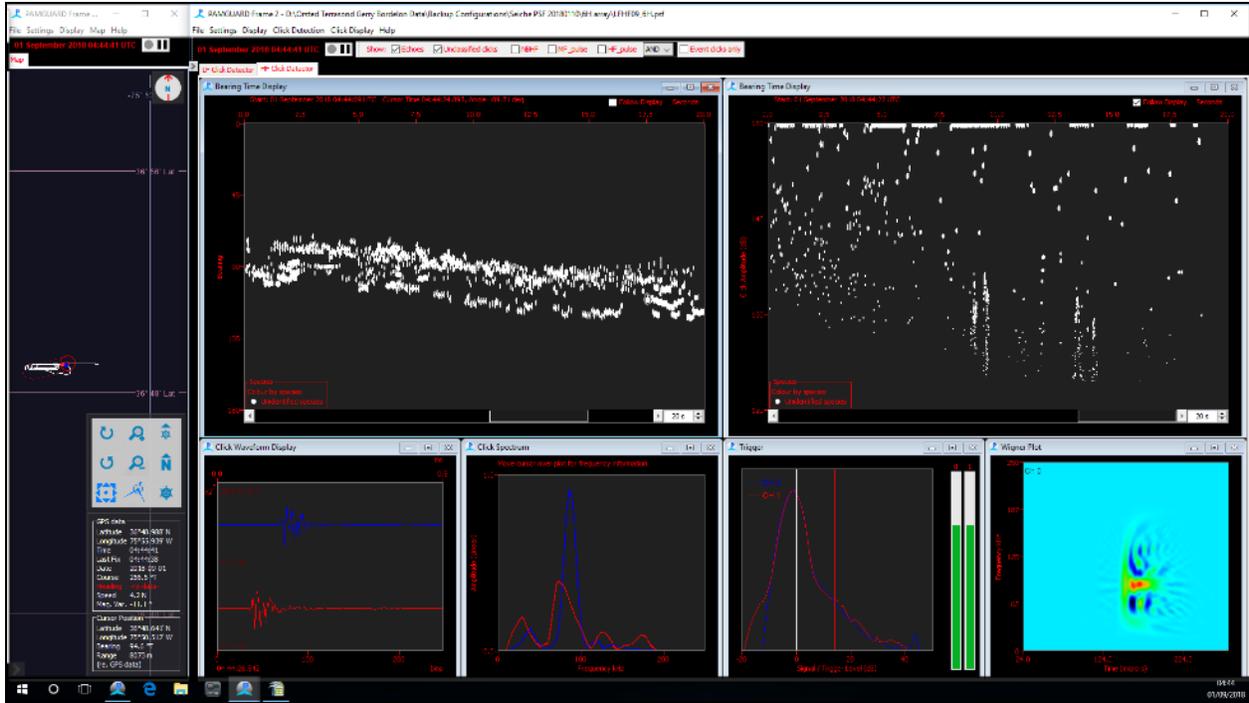


Figure I- 3: Acoustic Detection #03 - High frequency clicks of common bottlenose dolphins

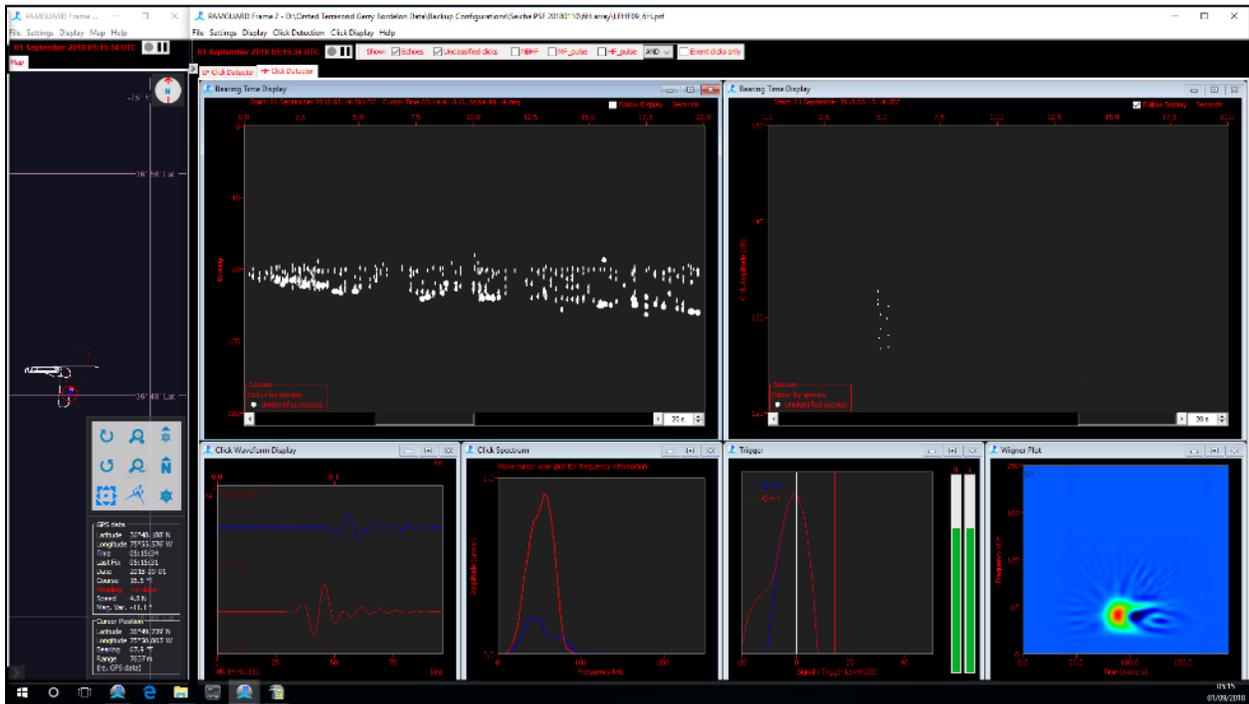


Figure I- 4: Acoustic Detection #04 - High frequency clicks of UNID dolphins

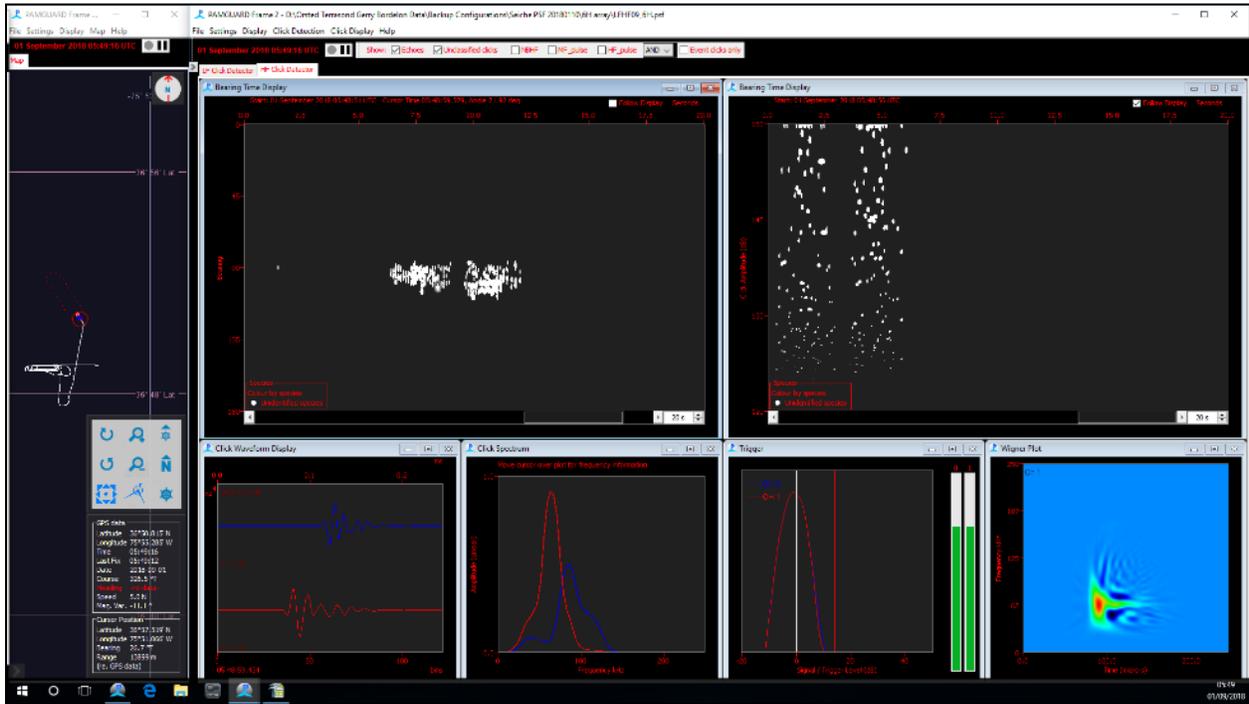


Figure I- 5: Acoustic Detection #05 - High frequency clicks of UNID dolphins

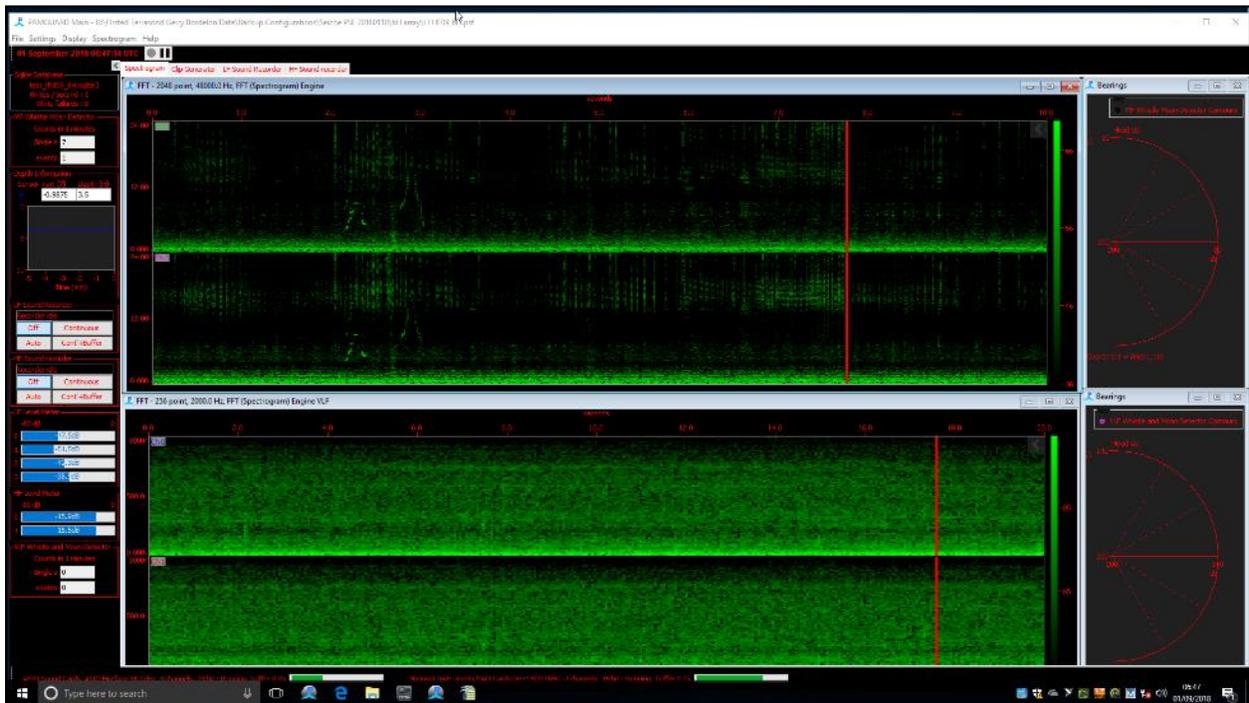


Figure I- 6: Acoustic Detection #06 - Whistles and burst pulse signatures of UNID dolphins

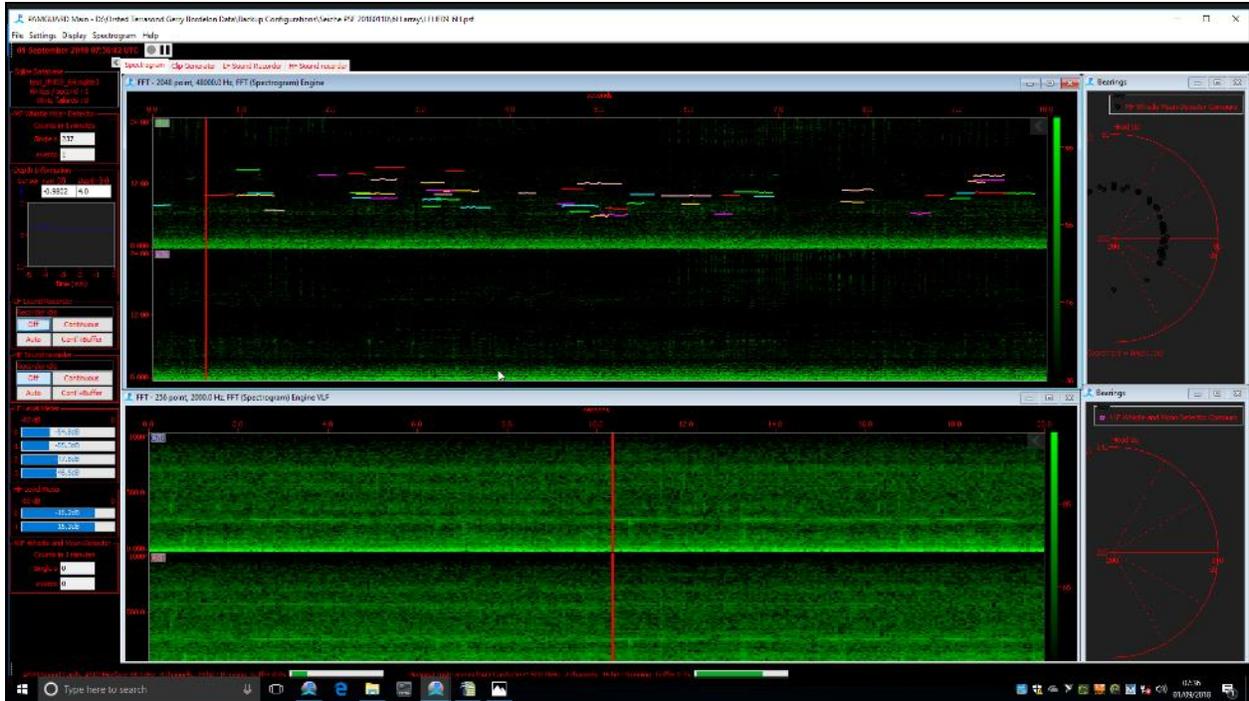


Figure I- 7: Acoustic Detection #07 - Burst pulse signatures and varying whistles of UNID dolphins

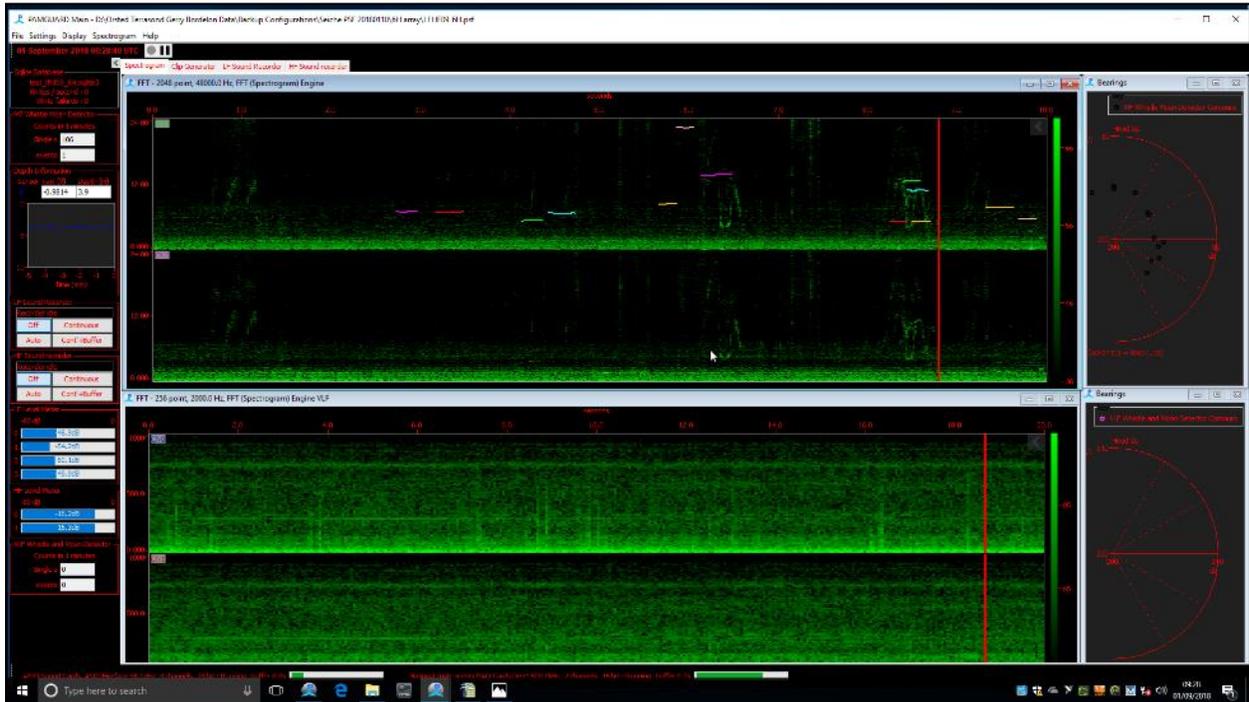


Figure I- 8: Acoustic Detection #08 - Multiple whistle signatures of UNID dolphins

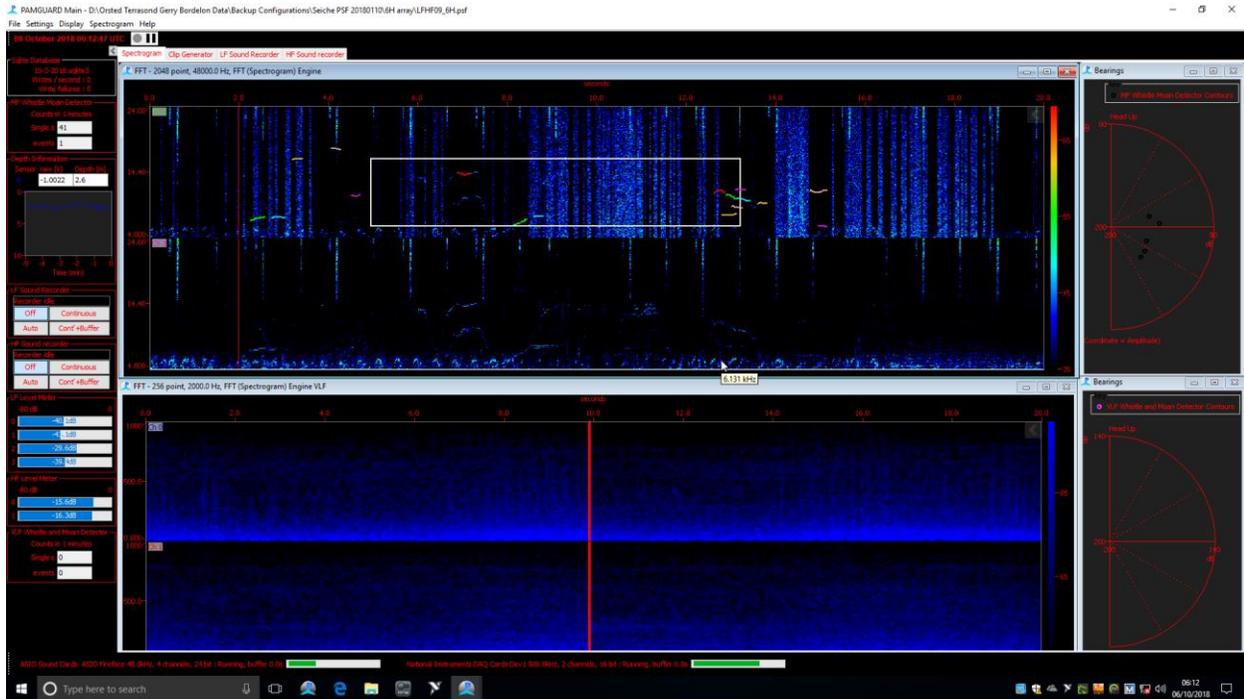


Figure I- 9: Acoustic Detection #09 - Multiple whistles signatures of UNID dolphins

APPENDIX J: **Summary of Mitigation Actions**

Table J- 1: Summary of Mitigation Actions

Date	Visual or Acoustic Detection Number	Species	Group Size	Source Activity (initial detection)	Closest Approach to Active Source (m)	Number of animals considered to be a Level A "take"	Number of animals considered to be a Level B "take"	Mitigation Action	Total Duration of Production Loss
Survey Mitigation Actions									
2018-08-09	1	Common bottlenose dolphin	10	Full volume while not on survey line	20	0	10	Shut-down of active source	00:00
2018-08-09	2	Leatherback sea turtle	1	Full volume while not on survey line	40	0	0	Shut-down of active source	00:00
2018-08-10	3	Leatherback sea turtle	1	Full volume while on survey line	60	0	0	Shut-down of active source	00:53
2018-08-10	4	Unidentifiable shelled sea turtle	1	Full volume while on survey line	80	0	0	Shut-down of active source	00:50
2018-08-10	6	Unidentifiable shelled sea turtle	1	Full volume while not on survey line	25	0	0	Shut-down of active source	00:32
2018-08-11	7	Unidentifiable shelled sea turtle	1	Full volume while not on survey line	210	0	0	Shut-down of active source	00:20
2018-08-17	22	Loggerhead sea turtle	1	Full volume while not on survey line	130	0	0	Shut-down of active source	00:33
2018-08-20	24	Unidentifiable shelled sea turtle	1	Full volume while on survey line	55	0	0	Shut-down of active source	01:01
2018-08-22	27	Unidentifiable shelled sea turtle	1	Full volume while not on survey line	180	0	0	Shut-down of active source	00:21
2018-08-22	28	Unidentifiable shelled sea turtle	1	Source deployed but silent	N/A	0	0	Delayed source activity	01:25
2018-08-23	29/AD1	Unidentifiable dolphin	9	Full volume while on survey line	39	0	0	Shut-down of active source	01:58
2018-08-23	30	Loggerhead sea turtle	1	Full volume while not on survey line	70	0	0	Shut-down of active source	00:09
2018-08-23	31	Loggerhead sea turtle	1	Full volume while not on survey line	135	0	0	Delayed source activity	00:43
2018-08-25	33	Unidentifiable dolphin	6	Full volume while not on survey line	50	0	0	Shut-down of active source	00:00
2018-08-25	34	Common bottlenose dolphin	15	Full volume while not on survey line	150	0	0	Shut-down of active source	00:50
2018-08-26	35	Leatherback sea turtle	1	Full volume while on survey line	100	0	0	Shut-down of active source	01:38
2018-08-26	37	Loggerhead sea turtle	1	Full volume while not on survey line	30	0	0	Shut-down of active source	01:06
2018-08-26	38	Loggerhead sea turtle	1	Full volume while not on survey line	12	0	0	Shut-down of active source	00:56

Date	Visual or Acoustic Detection Number	Species	Group Size	Source Activity (initial detection)	Closest Approach to Active Source (m)	Number of animals considered to be a Level A "take"	Number of animals considered to be a Level B "take"	Mitigation Action	Total Duration of Production Loss
2018-08-27	39	Loggerhead sea turtle	1	Full volume while on survey line	75	0	0	Shut-down of active source	00:31
2018-08-27	40	Loggerhead sea turtle	1	Source deployed but silent	N/A	0	0	Delayed source activity	01:29
2018-08-31	41	Unidentifiable shelled sea turtle	1	Full volume while on survey line	20	0	0	Shut-down of active source	01:16
2018-08-31	42	Unidentifiable shelled sea turtle	1	Full volume while on survey line	20	0	0	Shut-down of active source	01:12
2018-09-01	43/ AD 3	Common bottlenose dolphin	6	Full volume while on survey line	70	0	6	Shut-down of active source	00:32
2018-09-01	AD 4	Unidentifiable dolphin	2	Source deployed but silent	100	0	0	Delayed source activity	00:34
2018-09-01	AD 5	Unidentifiable dolphin	2	Source deployed but silent	100	0	0	Delayed source activity	00:59
2018-09-01	44/AD 6	Unidentifiable dolphins	3	Source deployed but silent	100	0	0	Delayed source activity	00:48
2018-09-01	45/AD 7	Unidentifiable dolphins	3	Source deployed but silent	20	0	0	Delayed source activity	01:33
2018-09-01	46/AD 8	Unidentifiable dolphins	6	Full volume while on survey line	20	0	0	Shut-down of active source	01:25
2018-09-01	47	Leatherback sea turtle	1	Full volume while not on survey line	75	0	0	Shut-down of active source	00:48
2018-09-01	48	Leatherback sea turtle	1	Source deployed but silent	180	0	0	Delayed source activity	01:09
2018-09-02	49	Unidentifiable shelled sea turtle	1	Full volume while on survey line	55	0	0	Shut-down of active source	01:11
2018-09-02	50	Unidentifiable shelled sea turtle	1	Full volume while on survey line	40	0	0	Shut-down of active source	01:00
2018-09-02	51	Loggerhead sea turtle	1	Source deployed but silent	N/A	0	0	Delayed source activity	01:08
2018-09-02	53	Loggerhead sea turtle	1	Full volume while on survey line	80	0	0	Shut-down of active source	01:17
2018-09-02	54	Loggerhead sea turtle	1	Full volume while on survey line	150	0	0	Shut-down of active source	00:39
2018-09-02	55	Leatherback sea turtle	1	Source deployed but silent	N/A	0	0	Delayed source activity	01:11
2018-09-02	56	Loggerhead sea turtle	1	Full volume while on survey line	103	0	0	Shut-down of active source	01:30

Date	Visual or Acoustic Detection Number	Species	Group Size	Source Activity (initial detection)	Closest Approach to Active Source (m)	Number of animals considered to be a Level A "take"	Number of animals considered to be a Level B "take"	Mitigation Action	Total Duration of Production Loss
2018-09-03	58	Leatherback sea turtle	1	Full volume while on survey line	25	0	0	Shut-down of active source	01:27
2018-09-03	59	Unidentifiable shelled sea turtle	1	Full volume while on survey line	20	0	0	Shut-down of active source	01:30
2018-09-03	63	Loggerhead sea turtle	1	Full volume while not on survey line	25	0	0	Shut-down of active source	01:03
2018-09-03	64	Loggerhead sea turtle	1	Full volume while not on survey line	77	0	0	Shut-down of active source	01:08
2018-09-03	66	Leatherback sea turtle	1	Full volume while on survey line	45	0	0	Shut-down of active source	00:54
2018-09-03	67	Leatherback sea turtle	1	Source deployed but silent	NA	0	0	Delayed source activity	01:20
2018-09-04	68	Unidentifiable shelled sea turtle	1	Full volume while on survey line	175	0	0	Shut-down of active source	00:28
2018-09-04	69	Loggerhead sea turtle	1	Source deployed but silent	N/A	0	0	Delayed source activity	00:49
2018-09-04	71	Loggerhead sea turtle	1	Source deployed but silent	N/A	0	0	Delayed source activity	00:06
2018-09-04	72	Leatherback sea turtle	1	Source deployed but silent	N/A	0	0	Delayed source activity	00:25
2018-09-04	73	Leatherback sea turtle	1	Source deployed but silent	N/A	0	0	Delayed source activity	00:23
2018-09-04	74	Leatherback sea turtle	1	Source deployed but silent	N/A	0	0	Delayed source activity	01:07
2018-09-04	75	Leatherback sea turtle	1	Full volume while on survey line	200	0	0	Shut-down of active source	00:52
2018-09-04	76	Leatherback sea turtle	1	Source deployed but silent	N/A	0	0	Delayed source activity	00:31
2018-09-04	77	Leatherback sea turtle	1	Source deployed but silent	N/A	0	0	Delayed source activity	00:25
2018-09-04	78	Loggerhead sea turtle	1	Source deployed but silent	N/A	0	0	Delayed source activity	01:20
2018-09-04	82	Leatherback sea turtle	1	Full volume while on survey line	50	0	0	Shut-down of active source	00:56
2018-09-04	84	Leatherback sea turtle	1	Source deployed but silent	N/A	0	0	Delayed source activity	00:09
2018-09-04	85	Leatherback sea turtle	1	Source deployed but silent	N/A	0	0	Delayed source activity	00:51

Date	Visual or Acoustic Detection Number	Species	Group Size	Source Activity (initial detection)	Closest Approach to Active Source (m)	Number of animals considered to be a Level A "take"	Number of animals considered to be a Level B "take"	Mitigation Action	Total Duration of Production Loss
2018-09-04	86	Leatherback sea turtle	1	Source deployed but silent	N/A	0	0	Delayed source activity	00:32
2018-09-04	87	Leatherback sea turtle	1	Source deployed but silent	N/A	0	0	Delayed source activity	01:01
2018-09-04	88	Leatherback sea turtle	1	Full volume while on survey line	180	0	0	Shut-down of active source	00:19
2018-09-04	89	Leatherback sea turtle	1	Source deployed but silent	N/A	0	0	Delayed source activity	01:03
2018-09-05	91	Leatherback sea turtle	1	Full volume while on survey line	150	0	0	Shut-down of active source	01:16
2018-09-05	92	Leatherback sea turtle	1	Full volume while on survey line	175	0	0	Shut-down of active source	01:05
2018-09-05	94	Loggerhead sea turtle	1	Full volume while on survey line	15	0	0	Shut-down of active source	01:05
2018-09-05	96	Leatherback sea turtle	1	Full volume while on survey line	33	0	0	Shut-down of active source	01:04
2018-09-06	97	Common bottlenose dolphin	2	Full volume while on survey line	55	0	2	Shut-down of active source	00:36
2018-09-06	98	Unidentifiable dolphin	2	Full volume while on survey line	25	0	0	Shut-down of active source	00:38
2018-09-06	99	Leatherback sea turtle	1	Full volume while on survey line	80	0	0	Shut-down of active source	00:54
2018-09-06	100	Unidentifiable shelled sea turtle	1	Source deployed but silent	N/A	0	0	Delayed source activity	00:46
2018-09-06	101	Unidentifiable shelled sea turtle	1	Source deployed but silent	N/A	0	0	Delayed source activity	01:14
2018-09-06	103	Leatherback sea turtle	1	Full volume while on survey line	135	0	0	Shut-down of active source	01:09
2018-09-06	104	Leatherback sea turtle	1	Full volume while not on survey line	15	0	0	Shut-down of active source	01:08
2018-09-06	105	Loggerhead sea turtle	1	Full volume while on survey line	150	0	0	Shut-down of active source	01:05
2018-09-06	106	Leatherback sea turtle	2	Full volume while on survey line	75	0	0	Shut-down of active source	00:16
2018-09-06	107	Loggerhead sea turtle	1	Source deployed but silent	N/A	0	0	Delayed source activity	01:07
2018-09-07	109	Leatherback sea turtle	1	Full volume while not on survey line	100	0	0	Shut-down of active source	00:05

Date	Visual or Acoustic Detection Number	Species	Group Size	Source Activity (initial detection)	Closest Approach to Active Source (m)	Number of animals considered to be a Level A "take"	Number of animals considered to be a Level B "take"	Mitigation Action	Total Duration of Production Loss
2018-09-07	111	Leatherback sea turtle	1	Source deployed but silent	N/A	0	0	Delayed source activity	00:17
2018-09-07	112	Leatherback sea turtle	1	Source deployed but silent	N/A	0	0	Delayed source activity	00:04
2018-09-07	113	Leatherback sea turtle	1	Source deployed but silent	N/A	0	0	Delayed source activity	01:03
2018-09-08	114	Leatherback sea turtle	1	Full volume while on survey line	140	0	0	Shut-down of active source	00:11
2018-09-08	115	Leatherback sea turtle	1	Source deployed but silent	N/A	0	0	Delayed source activity	01:13
2018-09-08	116	Leatherback sea turtle	1	Full volume while on survey line	N/A	0	0	Delayed source activity	01:11
2018-09-08	117	Leatherback sea turtle	1	Source deployed but silent	N/A	0	0	Delayed source activity	00:03
2018-09-08	118	Leatherback sea turtle	1	Source deployed but silent	N/A	0	0	Delayed source activity	00:13
2018-09-08	119	Leatherback sea turtle	1	Source deployed but silent	N/A	0	0	Delayed source activity	00:12
2018-09-08	120	Leatherback sea turtle	1	Source deployed but silent	N/A	0	0	Delayed source activity	00:23
2018-09-08	121	Leatherback sea turtle	1	Source deployed but silent	N/A	0	0	Delayed source activity	00:42
2018-09-08	122	Leatherback sea turtle	1	Source deployed but silent	N/A	0	0	Delayed source activity	00:40
2018-09-08	123	Loggerhead sea turtle	1	Source deployed but silent	N/A	0	0	Delayed source activity	01:08
2018-09-08	124	Leatherback sea turtle	1	Full volume while on survey line	65	0	0	Shut-down of active source	01:03
2018-09-22	127	Loggerhead sea turtle	1	Full volume while not on survey line	100	0	0	Shut-down of active source	00:57
2018-09-23	128	Leatherback sea turtle	1	Full volume while on survey line	15	0	0	Shut-down of active source	01:04
2018-09-26	129	Common bottlenose dolphins	4	Full volume while not on survey line	30	0	0	Shut-down of active source	00:00
2018-09-26	131	Common bottlenose dolphins	5	Full volume while not on survey line	25	0	1	Shut-down of active source	00:00

Date	Visual or Acoustic Detection Number	Species	Group Size	Source Activity (initial detection)	Closest Approach to Active Source (m)	Number of animals considered to be a Level A "take"	Number of animals considered to be a Level B "take"	Mitigation Action	Total Duration of Production Loss
2018-09-26	132	Common bottlenose dolphins	11	Full volume while not on survey line	40	0	0	Shut-down of active source	00:00
2018-09-26	133	Common bottlenose dolphins	1	Full volume while not on survey line	45	0	0	Shut-down of active source	00:00
2018-09-27	135	Loggerhead sea turtle	1	Full volume while on survey line	15	0	0	Shut-down of active source	01:00
2018-09-28	137	Common bottlenose dolphins	4	Full volume while not on survey line	30	0	4	Shut-down of active source	00:00
2018-09-29	143	Common bottlenose dolphins	1	Full volume while not on survey line	25	0	1	Shut-down of active source	00:00
2018-09-29	145	Common bottlenose dolphins	12	Full volume while not on survey line	50	0	1	Shut-down of active source	00:00
2018-09-30	148	Unidentified shelled sea turtle	1	Full volume while not on survey line	120	0	0	Shut-down of active source	01:11
2018-10-02	162	Common bottlenose dolphins	4	Full volume while not on survey line	30	0	4	Shut-down of active source	00:39
2018-10-03	164	Common bottlenose dolphins	3	Full volume while not on survey line	40	0	1	Shut-down of active source	00:18
2018-10-07	168	Common bottlenose dolphins	4	Full volume while not on survey line	30	0	1	Shut-down of active source	00:19
2018-10-09	172	Unidentified shelled sea turtle	1	Full volume while not on survey line	80	0	0	Shut-down of active source	01:08
2018-10-14	175	Common bottlenose dolphins	45	Full volume while on survey line	25	0	1	Shut-down of active source	00:18
2018-10-14	176	Common bottlenose dolphins	50	Full volume while not on survey line	40	0	5	Shut-down of active source	00:22
2018-10-16	182	Common bottlenose dolphins	8	Full volume while on survey line	30	0	4	Shut-down of active source	00:26
2018-10-22	188	Loggerhead sea turtle	1	Source not yet deployed	175	0	0	Delayed source activity	00:45
2018-10-22	189	Leatherback sea turtle	1	Source deployed but silent	25	0	0	Delayed source activity	01:00