CONTRACT NO. HY/2012/07
Hong Kong-Zhuhai-Macao Bridge
Tuen Mun – Chek Lap Kok Link (Southern Connection Viaduct Section)
Baseline Monitoring Report for Underwater Noise and Dolphin Acoustic Behavioural Monitoring

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1. INTRODUCTION

The Tuen Mun-Chek Lap Kok Link (TM-CLKL) comprises a 1.6 km long dual 2-lane viaduct section between the Hong Kong Boundary Crossing Facilities (HKBCF) and the North Lantau Highway and associated roads at Tai Ho. Gammon Construction Limited (hereinafter called the "Contractor") was awarded as the main contractor of Contract No. HY/2012/07 – Hong Kong-Zhuhai-Macao Bridge (HZMB) Tuen Mun-Chek Lap Kok Link (TM-CLKL) – Southern Connection Viaduct Section.

According to Section 6.4.5. of the TM-CLKL EM&A Manual, a bored piling monitoring programme in relation to Chinese white dolphins (a.k.a Indo-Pacific humpback dolphins, *Sousa chinensis*) shall be conducted during baseline and construction phases. These include underwater noise levels measurements to evaluate the details of frequency and intensity spectra of the bored piling noise in relation to dolphin acoustic behaviours, and dolphin acoustic behavioural monitoring to record and note any changes in response of dolphins to the bored piling noise. Such monitoring shall be undertaken by qualified dolphin specialists who have sufficient relevant post-graduate experience and publication in the respective aspects. Approval of the specialists responsible for these bored piling monitoring studies shall be sought from AFCD and EPD, and Drs. Bernd Würsig, Marc Lammers, Lisa Munger and Katherine Kim were selected and approved.

This monitoring assessment of underwater noise and dolphin acoustic behaviour for the initial baseline phase details the methodology and results in the baseline phase (September 26 to October 25, 2013) to meet the requirement in the particular specification and EM&A Manual. The present data will need to be compared to construction and post-construction phases in due time.

2. METHODS AND MATERIALS

2.1. Overall Objective and Scheme

For the underwater noise study, the primary objectives were to measure and characterize: (1) baseline ambient noise levels during the pre-construction phase of development; and (2) industrial noise levels associated with bored piling activities during the construction phase. The results obtained from this study, in conjunction with the concurrent dolphin acoustic behavioural and shore-based theodolite tracking studies, would provide guidance with respect to mitigation for the resident dolphin population.

On the other hand, the primary objective of the dolphin acoustic behavioural study was to investigate their acoustic behaviour and movement in response to bored piling sites during both baseline and construction phases. Overall, a set of parameters such as the presence of dolphin acoustic signaling, durations of periods of acoustic activity, relative occurrence of different kinds of signals per unit time and shifts in the time of day of acoustic activity were quantified. Other factors would also need to be measured concurrently during baseline and construction phases in order to understand whether any observed differences in acoustic behaviour of dolphins may represent a reaction to the bored piling works, or are an artifact of other factors. To achieve this goal, the primary approach was to conduct dedicated acoustic surveys of focal follows of Chinese white dolphins in North Lantau with sound recordings taken from a dipping hydrophone deployed from the research vessel, and their movements near the bored piling site were also monitored during focal follow sessions for both baseline and construction phases. These recordings were used to establish baseline acoustic behaviour of the dolphins (e.g. rate of sound production, types of sounds), and its relation to visually determined dolphin group size, behaviour (e.g. foraging, socializing, traveling, milling) and covariates such as the time of day, Beaufort sea state, and occurrence of nearby vessels. Types, distances, and behaviours of vessels will be determined from the recording vessel using laser rangefinder.

A complementary approach for the acoustic data collection was to deploy two sets of ecological acoustic recorders (EARs) near the bored piling site and at a control site for passive acoustic monitoring during both baseline and construction phases. The EARs are bottom-moored, autonomous acoustic recording systems that are used to monitor ambient sounds on a programmable duty cycle (see detailed specifications of EAR in Lammers et al. 2008). They have a programmable bandwidth up to 40 kHz and can be deployed from days to months at a time. Based on past experience in other areas, the effective detection range of EARs on dolphin signals in Hong Kong waters is estimated to be between 500-1,000 metres.

2.2. Monitoring Location

To characterize the local soundscape, underwater sound data collection were conducted mostly in the northeastern waters of Lantau Island during baseline phases where bored piling activities in association with TM-CLKL construction will occur. Sound measurements were made at various distances from six bored piling sites along the TM-CLKL alignment (Figure 1), to allow estimation of a simple acoustic propagation model for the region where bored piling activities will occur during the construction phase. The numberings and locations of these six bored piling sites to be monitored during baseline phase were listed as follow (some of the bored piling works from different pier sites will be conducted concurrently), and three of these six sites will be chosen for impact phase monitoring from the start of the bored piling activities when the initial phase of the construction schedule is confirmed:

Pier No.	Northing	Easting	Number of Bored Piles	Tentative Starting and Ending Months since Commencement of Marine Bored Pile Construction**
B1	818342	814940	3	Month 9-14
B2	818306	814987	2	Month 9-14
B3	818261	815028	2	Month 9-14
B5	818152	815081	2	Month 9-14
B6	818094	815091	3	Month 9-14
B7	818035	815093	2	Month 9-11

** As the commencement date of the works under the contract was 22 June 2013, which is month 0, Month 9-14 would represent March-August 2014, while Month 9-11 would represent March-May 2014.

Moreover, the dolphin acoustic behavioural study were conducted concurrently with the underwater noise study mostly in the northeastern waters of Lantau Island where the bored piling activities will occur. For this study, the research vessel would follow a predefined route for systematic search effort in Northeast Lantau region to cover the area overlapped with the TM-CLKL alignment (Figure 2), where dolphins will be potentially disturbed by the bored piling works during the construction phase. The acoustic surveys would also cover some part of Northwest Lantau waters as control sites, where dolphins were likely encountered for acoustic data collection but would not be disturbed by the bored piling activities (e.g. Sha Chau, Lung Kwu Chau, Black Point).

The EARs were deployed at two locations: 1) within 500 m of the bridge alignment (Site C1: N 818198, E 814807), and 2) a control site between Sha Chau and Lung Kwu Chau (Site C2: N 825101, E 806072), a less disturbed site relatively far away from the bridge alignment (Figure 2). The scientific permit obtained from AFCD to deploy the EAR within the Sha Chau and Lung Kwu Chau Marine Park (i.e. Site C2) was attached with this report.

2.3. Monitoring Methodology

2.3.1. Underwater noise study using dipping hydrophone

The underwater sound recording system consists of a high-sensitivity, high-bandwidth hydrophone (International Transducer Corporation ITC-6050c) and two-channel audio recorder (Sound Devices 702T). The hydrophone was deployed from the stern of the research vessel, a deployment scheme sometimes referred to as a “dipping hydrophone”, approximately mid-water column at a depth of 5 m beneath a 2 m spar buoy. The hydrophone cable was faired to streamline water flow around the cable, reducing pseudonoise and eliminating cable vibration. The vessel would “go quiet” (its engine, generator, bilge pump, and depth sounder turned off) and drift for the duration of each recording. The recording system and deployment method generally followed that of another well-established study of underwater sounds in Hong Kong waters (Würsig and Greene 2002).

The ITC-6050c is a wide-band hydrophone with a built-in, low-noise preamplifier for optimum noise performance. Its nominal operating band is 30 Hz to 70 kHz, and its self-noise level is well below Knudsen Sea State 0 up to 20 kHz. The hydrophone signal would be amplified as needed via a postamplifier with user-selectable gains from 0 to 60 dB in 10 dB increments. The audio recorder was configured to sample 16-bit data received on each of its two channels at a rate of 192 kHz, thus allowing analysis of the acoustic data up to 96 kHz. According to Section 6.4.5 of the EM&A Manual, “the acoustic results of the monitoring should be analyzed in terms of both the broadband range (100 Hz to 25.6 kHz) and, also, the dolphin sensitive range (400 Hz to 12.6 kHz).” In compliance with the EM&A Manual requirement, the acoustic data collected from the present underwater noise study was analyzed between 30 Hz and 40 kHz, avoiding a hydrophone resonance frequency at 50 kHz.

Observers would log document the recording date, start and end times, hydrophone and water depths, Beaufort sea state, survey area, and postamplifier gain in each recording. Wind speed, often directly correlated with underwater levels, were measured and documented in the survey team's logs. The wind speed measurements were performed with a handheld Kestrel 1000 anemometer, containing an impeller with precision axle and low-friction bearings, providing 0.1 m/s resolution between 0.6–40.0 m/s and an accuracy (calculated using two standard deviations) of the larger of 3% of the reading, least significant digit, or 0.1 m/s.

2.3.2. Dolphin acoustic behavioural study using dipping hydrophone

During dedicated acoustic surveys, the survey team of 2-3 HKCRP researchers conducted systematic search for dolphins within the study area. The survey protocol to search for dolphins was similar to the line-transect survey methodology adopted in the vessel survey under the AFCD long-term marine mammal monitoring programme (Hung 2012, 2013) as well as various HZMB EM&A dolphin monitoring programmes. For each survey, a 15-m inboard vessel with an open upper deck was used to make observations from the flying bridge area, at a visual height of 4-5 m above water surface. The two observers searched with unaided eyes and 7 x 50 marine binoculars ahead of the vessel (between 270^o and 90^o in relation to the bow, which is defined as 0^o). The survey team recorded effort data including time, position (latitude and longitude), weather conditions (Beaufort sea state and visibility), and distance travelled in each series (a continuous period of search effort) with the assistance of a handheld GPS.

When dolphins were sighted, the survey team ended the search effort, and the research vessel was diverted from its course to slowly approach the animals for group size estimation, assessment of group composition, and behavioural observations in the initial 5-10 minutes. The dipping hydrophone was then deployed 3 to 7 metres below the sea surface by 2-metre long spar buoy from the stern of the research vessel, with vessel engine noise off and the vessel drifting. Broadband dolphin recordings was made with the same set of underwater sound recording system as mentioned in Section 2.3.1 (see previous paragraph for detailed description). According to Section 6.4.5 of the EM&A Manual, "the acoustic results of the monitoring should be analyzed in terms of both the broadband range (100 Hz to 25.6 kHz) and, also, the dolphin sensitive range (400 Hz to 12.6 kHz)." Dolphin acoustic data collected from the recording system was analyzed from 100 Hz and up to 40 kHz, which avoided a hydrophone resonance frequency at 50 kHz. This range would be sufficient to detect the presence of dolphin acoustic signals and their temporal parameters (e.g. click intervals), while it was also in compliance with the EM&A Manual requirement.

During the dipping hydrophone deployment, the date, start and end times, hydrophone and water depths, Beaufort sea state, survey area, locations, gain, event, and notes were taken for each recording in five-minute intervals. Within each corresponding five-minute interval, observers also noted variables including the group size, group composition and general behaviour during the 5-minute period (i.e. feeding, socializing, travelling, resting, milling and any aerial activity). The number of vessels that passed within 500 m of the dolphin group was also recorded during the same 5-minute interval, with special notes on close approaches by vessels within 100 m of dolphins, including the time of closest approach and any behavioural reaction being noted. Distances of vessels were gathered by hand-held laser rangefinder (*Bushnell* Yardage Pro 800; maximum range of detection for most objects: 720 metres; ranging accuracy ± 2 metres under most circumstances). Also, notes were made on the approximate distance (i.e. 0-250m, 250-500m, >500 m) of the dolphin groups to the hydrophone during the 5-minute interval. Notably, positions of dolphin group was recorded continuously during the entire focal follow session to examine their movements in detail, especially when they occur in the vicinity of the TM-CLKL alignment.

2.3.3. Passive acoustic monitoring using EARs

Two sets of EARs were deployed at two sites in North Lantau, one near the bored piling site and another at a control site between Sha Chau and Lung Kwu Chau. The EARs were deployed and recovered by a professional dive team from Oceanway Corporation Limited. During each deployment, the EAR serial number, as well as the time and date of deployment were recorded. Moreover, the GPS position, water depth and type of substrate at the deployment location were also recorded.

The EARs were programmed to record on a 20% duty cycle (1 minute "on" for every 5 minutes). Recordings was from approximately 20 Hz at the low end to 32 kHz at the high end, which effectively covered a major part of the acoustic channel of the Chinese White Dolphins (Sims et al. 2011). Data from the EARs were downloaded onto a computer hard disk at the end of the baseline monitoring period, and will then be re-deployed at the same location before the start of bored piling works until the study is completed at the end of the 30 days of construction phase monitoring.

2.4 Data Analysis

2.4.1. Dipping hydrophone data for underwater noise measurement

The acoustic data were analysed for narrowband spectra, one-third-octave band levels, and broadband levels. The levels were tabulated and summarized with respect to various noise contributors including but not limited to vessels, wind, industrial activity, and biological sounds.

Due to the transient nature of vessel noise and the highly variable ambient noise levels encountered throughout the study, the estimation of a single baseline noise level representative of the study area is not be feasible. However, ambient noise levels were quantitatively characterized and their potential masking effect on dolphin vocalization was discussed.

2.4.2. Dipping hydrophone data for dolphin acoustic behaviour

To evaluate if dolphin acoustic behaviour varies between baseline and construction phases, a number of parameters will be examined during both phases for comparison, and this data analysis has begun for the baseline phase. For the calibrated hydrophone data, parameters include the duration of acoustic encounters of dolphins and the rates of their whistling and click production (echolocation and burst pulses) per 5 min recording time bin. The rates of sound production as a function of dolphin group size, behavioural state, location and time of day were also examined.

For the comparison of response variables between baseline and construction phases, each 5 min recording time bin was treated as a sample point, providing a measure of the rate of whistling (whistles/min) and click production (clicks/min). The rate of whistling is quantified for each time period by visually and aurally examining individual recordings and logging the presence of signals using the program Raven Pro 1.5™. Click production (echolocation and burst pulses) was quantified using a custom-written click detector program in MATLAB™ R2011b. Recording periods when the dolphins were more than 500 m away or when they were on the bow of the research vessel were excluded from consideration.

To investigate signal production as a function of dolphin group size, the whistling and clicking rates were binned by group size as follows: 1 individual dolphin, 2-5 dolphins, 6-9 dolphins, and 10+ dolphins. The whistling and clicking rates were also similarly grouped by the behavioural categories of milling, traveling, socializing, feeding and resting. Signal production by time of day was investigated by grouping the number of sightings and rates of whistling and clicking occurring in five two-hour periods of data collection (08:00-09:59, 10:00-11:59, 12:00-13:59, 14:00-15:59 and 16:00-17:59). Finally, to examine sound production by location, the GPS coordinates of the first recording for each sighting were plotted using Google Earth™, and these were divided into two zones based on proximity to the construction area. The recordings were then grouped by zone.

2.4.3. EARs data for passive acoustic monitoring

The data from EARs were analyzed by visually and aurally examining individual recordings. The presence of clicks and/or whistles was used to establish the presence of dolphins near the EAR.

Analysts scanned spectrograms of each file in either a 60-second display window (browsing mode) or a 10-second display window (verification mode). Dolphin sounds were confirmed visually and aurally by playing back at reduced speed (usually to ½ original speed, and in some cases ¼ speed).

The occurrence of dolphin signals was used to examine temporal trends in dolphin presence and activity level, and to provide a baseline for future comparison with the construction phase. The number and duration of dolphin encounters was established for each day. Here an encounter is defined as a period of recordings containing dolphin signals in which the interval between detected signals is less than 30 minutes. For example, two recordings with detections separated by 25 minutes would be treated as part of the same encounter, while two recordings with detections separated 40 minutes would be treated as two separate encounters. In addition, the overall acoustic behaviour (not per individual dolphin) was also established and any changes in temporal patterns (e.g. from mostly calling at night, to mostly during the day, or vice versa), or any increase/reduction and change in the mean duration of acoustic presence at the location of EAR deployment will be compared between pre-construction and construction phases.

3. RESULTS AND ANALYSES

3.1. Summary of acoustic monitoring effort

Thirty days of acoustic monitoring surveys were conducted between 26 September and 25 October 2013 for the baseline period (see Appendix I for detailed monitoring schedule). During this period, 1,894.7 km of survey effort were conducted to search for dolphins in the North Lantau region. From these 30-days of monitoring surveys, 469 underwater sound samples were collected, with 26 hours and 46 minutes of recordings of ambient sound levels and dolphin vocalizations under various environmental conditions and during different times of the day (Appendix II). Moreover, 70 dolphin groups, numbering 301 animals, were encountered during these surveys (Appendix III), and 122 sound samples were taken from some of these dolphin groups (Appendix IV).

3.2. Underwater noise study (dipping hydrophone)

A total of 472 underwater acoustic recordings were available for the underwater noise study. These sound files were quality-checked to assess their suitability for noise analyses. Thirty-two recordings included mid-recording, user-selectable, gain changes which introduced high-frequency artifacts most noticeable above 10–20 kHz. These recordings were discarded so as not to bias the acoustic results with electronic noise. After data quality checking, 440 recordings remained for subsequent noise analyses.

In compliance with Section 6.4.5 of the EM&A Manual, the acoustic data were analyzed in terms of both a "wideband" frequency range of 30 Hz to 40 kHz and a "dolphin-sensitive" frequency range of 400 Hz to 12.5 kHz. Figure 3 depicts the mean bandlevel for each of the 440 recordings for the "wideband" frequency range (shown in red) and the "dolphin band" (shown in blue). Bandlevels were averaged over the duration of each recording, where recording durations ranged from 1 minute, 58 seconds up to 6 minutes, with most recordings around 3 minutes in duration. As seen in Figure 3, wideband levels were always greater than dolphin-band levels, as expected. Mean bandlevel across all recordings (n = 440) was 116.71 ± 6.29 dB re 1 µPa for the wideband case and 112.27 ± 6.36 dB re 1 µPa for the dolphin band case, where "± x.xx" refers to one standard deviation from the mean and indicates the degree of variability in the measurements. In addition, as anticipated, bandlevels varied greatly as a function of time, as illustrated in Figure 3, but also within individual recordings. This variability was due to the numerous transient noise sources, primarily transiting ships, present in the waters off Hong Kong. According to observer logs and confirmed in the acoustic records, vessel traffic is the greatest contributor to the local soundscape.

Wind and the subsequent sea surface waves it generates are a common and well-known source of ambient noise in the world's oceans. Wind speed was measured directly at the time of each recording, and the related Beaufort sea state was also logged by field personnel. Wind speed measurements (which ranged from 0 to 7.7 m/s) and Beaufort sea states (0 to 5) generally agreed. However, wind speeds were usually quite low, averaging only 1.00 ± 0.05 m/s, and no correlation was found between wind speed and mean bandlevels, with a Pearson's correlation coefficient of 0.05 (see Figure 4). The lack of correlation can be attributed to a number of factors: low wind speeds, deviation from wind-generated ambient noise models due to the shallow waters, and masking by other noise sources. The latter is especially relevant given the high shipping density in the region and the fact that wind and shipping noise compete in similar frequency bands (i.e. order tens to hundreds of Hz).

The potential effect of tides on ambient sound levels was also investigated. Tidal height, and by proxy, tidal current, can contribute to background noise levels in the form of, e.g., rolling gravel or similar on the seafloor, but often takes the form of "pseudo-noise", i.e., flow noise, which contaminates underwater measurements. Figure 5 shows predicted tidal heights and measured bandlevels throughout the study. No significant correlation was found between tidal height and mean bandlevels (Pearson's correlation coefficient of 0.10). The recording system, by design, employed a spar buoy and faired hydrophone cable to mitigate cable tension and flow noise, so no tidal effects were expected.

Of the 440 recordings utilized in the ambient noise study, 122 recordings contained dolphin vocalizations. The mean bandlevels for these recordings containing dolphin vocalizations are shown in Figure 6. Average bandlevel across these recordings was 118.44 ± 5.88 dB re 1 μPa and 114.94 ± 5.26 dB re 1 μPa for the wideband frequency range (red) and dolphin band (blue), respectively. By comparison, recordings without dolphin vocalizations (n = 318) had average bandlevels of 116.04 ± 6.33 dB re 1 μPa and 111.24 ± 6.46 dB re 1 μPa for wide and dolphin frequency bands, respectively. Mean bandlevel was calculated across the entire recording and the bandwidth as indicated, regardless of the duration and frequency extent of detected dolphin vocalizations. Consequently, bandlevels for the recordings containing dolphin vocalizations may not be representative of received levels of individual dolphin vocalizations, and likely contain other sound sources such as vessels, and, therefore, should be interpreted with caution. However, the large sample sizes and over 3 dB difference in average bandlevels with and without dolphin vocalizations, notably manifest in the dolphin band, suggest that dolphin vocalizations can contribute significantly to the soundscape.

Field personnel documented actively operating industrial activity that might contribute sound energy received by the recording system. Figure 7 shows mean bandlevels for recordings annotated with such industrial sound sources (n = 97), specifically, fishing activity (depicted as triangles), dredging (depicted as squares), and other general industrial activity (depicted as stars). As in previous figures, red represents analyses over the wideband frequency range and blue the dolphin-sensitive band. Figure 7 shows broadband received levels and provides only a very rough indication of broadband source levels of various industrial activities. Received levels are a function of source-to-receiver range, and distances to sound sources shown in Figure 7 ranged from a gillnet fishing vessel operating 99 m from the hydrophone to dredging operations 1153 m away. Furthermore, the mean bandlevel was calculated across the entire recording, and thus, measured sound levels represent other concurrent sound sources, such as the many vessels documented during these recordings and/or potential dolphin vocalizations. Vessels were present in all of Figure 7's recordings of industrial activity, and, out of those 97 recordings, dolphin vocalizations were detected in ten of them, notably nine of which involved fishing activity. Estimating source levels of aforementioned industrial activity or of specific vessels is beyond the scope of this study. However,

Figure 7 does show received sound levels containing concurrent industrial activity and unequivocally illustrates the high rate of occurrence of such activity.

The soundscape's time variability is demonstrated in Figure 8 in which mean bandlevels for all 440 recordings are shown as a function of time of day, represented by 12 two-hour periods. Red and blue represent the wideband frequency range and "dolphin-sensitive" band, respectively, and, as expected, wideband bandlevels are always higher than dolphin-band bandlevels. During the study's October timeframe, sunrise occurred at ~0600 HKT and sunset at ~1800 HKT. Figure 8 shows increased sound levels between sunrise and sunset. Sample sizes are indicated by the numbers above each bar in the histogram. A bias might be present due to the relatively small sample sizes outside daytime hours (n = 82, as compared to the sample size in daytime hours (n = 358)), but increased sound levels during daytime hours may also be attributed to increased vessel traffic, fishing, construction, and other anthropogenic activity more likely to occur during the day.

During the impact phase of this study, sounds associated with bored piling activity will be measured and subsequently modeled and compared to baseline phase ambient noise measurements. For the baseline phase, sound levels were measured at different distances from proposed bored piling pier locations on 3 October , 8 October, 11 October, 15 October, and 21 October 2013. The resultant mean bandlevels are given in Table 1 for bandlevel calculations over the wideband frequency range and over the dolphin-sensitive band (approximately 114 dB re 1 μPa and 108 dB re 1 μPa, respectively). As one might expect, devoid of any nearby sound sources different from those encountered elsewhere in the study area during the baseline phase in the absence of any bored piling activity, mean bandlevels and their variability were similar to other measurements in the environment (refer to Figure 3) and were the same value (within a standard deviation) regardless of source-to-receiver range. If construction-related sounds exceed ambient noise levels during the impact phase of the study, one will expect to see a monotonic decrease in sound levels on the order of 10logR to 20logR, where R is the range between the sound source and recording hydrophone.

3.3. Dolphin acoustic behavioural study (dipping hydrophone)

During the baseline acoustic monitoring period, a total of 629 recording minutes were made. Figure 9 shows the number of recording minutes summed for each day, as well as the number of sightings per day. Recordings were obtained on all but 8 days of the 30-day period. The daily number of 5-minute recordings ranged between 0 and 15 (mean = 4.4, stdv = 4.1) and the daily number of minutes recorded was between 0 and 73.4 (mean = 21.0, stdv = 20.1).

Whistling and clicking rates were determined for all recordings (n =122). Figure 10 shows the daily rate of click and whistle production recorded. The mean daily whistling rate was 2.8 whistles/min (stdv = 3.9) and the mean click production rate was 165.9 clicks/min (stdv = 100.0).

The variability of whistling and clicking rates was examined as a function of group size, behavioural state, time of day, Beaufort sea state and location within the study area. Figure 11 shows the rate of both click and whistle production as a function of group size. The rate of whistling generally increased with group size while the rate of click production did not vary much. In Figure 12 the rate of signaling is represented in relation to the dolphins' observed behavioural state during the recording period. Milling was the most common behavioural state noted. Whistling rates did not vary greatly across behavioural states. However, the rate of click production was greatest when the animals were observed socializing.

The greatest number of recordings were made during the 12:00-13:59 time period (n = 52), followed by the 10:00-11:59 period (n = 35), the 14:00-15:59 period (n = 27), the 16:00-17:59 period (n = 11), the 08:00-09:59 period (n = 5) and lastly the 18:00-19:59 period (n = 1) (Figure 13). Not counting the 18:00-19:59 time period, which had only one recording, the lowest and highest rates of and click production occurred in the morning period from 08:00 to 09:59 and the afternoon period from 14:00 to 15:59, respectively. Whistling rates, on the other hand, were lowest during the middle of the day from 12:00 to 13:59 and highest in the afternoon from 14:00 to 15:59. Notably, the daily monitoring effort has been held consistent throughout the entire monitoring period. However, the recording effort was largely depended upon the time of dolphin occurrence and whether they were available for recording. Therefore, no bias was introduced in the monitoring and recording effort throughout the day, which may be related to the observed asymmetry in peak rates of whistling and clicking during the day.

A total of 117 recordings were made with vessels transiting nearby. Of these, 17 were with vessels between 0 and 99 m at the closest approach, 26 were between 100 and 199 m, 14 were between 200 and 299 m, 13 between 300 and 399 m, 11 between 400 and 499 m, and 36 were 500 m or further away. There was a wide variation in both clicking and whistling rates for vessels at all six range categories (Figure 14). No specific conclusions can be drawn about the effects of vessel distance on signaling rate from these data.

Recordings were collected in Beaufort sea states (BSS) ranging from 1 to 5. There were 8 recordings made in BSS 1, 77 recordings in BSS 2, 41 recordings in BSS 3, 4 recordings in BSS 4, and 1 recordings in BSS 5. Whistling rates decreased with increasing BSS. Clicking rates were equivalent between BSS 2 and 4, and were highest in BSS 5 (Figure 15). However, only one recording was made in BSS 5, so it must be considered an outlier and not necessarily representative of a change in the dolphins' acoustic behavior.

The location of each recording and the division of the study area into two zones are shown in Figure 16. Zone 1b includes the construction area, while Zone 1a is to the west of the construction area. An approximately equal number of recordings were made in Zones 1a (n = 65) and 1b (n = 66). The rates of clicking were equivalent between two zones (Figure 17). However, considerably more whistles were recorded in Zone 1b. This difference was highly significant (Mann-Whitney U Test, $U = 849.5$, $p < 0.001$).

3.4. Passive acoustic monitoring (EARs)

The EAR at Bridge Alignment Area (Site C1) was deployed between 27 September and 5 November, 2013 for a total of 40 days. It yielded 11,446 one min recordings totaling 190 hours of data. The EAR near Lung Kwu Chau (site C2) was also deployed between 27 September and 5 November 2013 for 40 days and recorded 11,464 one min files. However, as agreed in the methodology proposal, only the first 30 days of collected EAR data, between 27 September and 26 October 2013, were considered for analysis.

3.4.1. Site C1 – Bridge Alignment Area

Dolphin signals were detected on 26 out of 30 days of EAR recordings at this site. Figure 18 shows the percentage of files for each day (288 recordings per day) that contained dolphin signals. Daily dolphin acoustic activity was low, with between 0% and 4.5% of recordings containing dolphin signals any given day. Figure 19 shows the number of dolphin encounters (as defined in section 2.4.3) and the mean duration of encounters for each day of the deployment period. There were a mean of 4.6 encounters per day (S.D. = 3.3) at site C1, which lasted a mean of 1.9 min (S.D. = 3.6).

Figure 20 shows the occurrence of dolphin acoustic signals in EAR recordings at site C1 as a function of the hour of the day. All detections were of dolphin click trains. No detections were made of dolphin whistles. Two possible explanation for this are that: 1) dolphins engage in little or no socializing activities (which are typically characterized by whistling) in this area, or 2) ambient and/or anthropogenic noise in the frequency bands associated with whistles (4-12 kHz) masked any whistles that were present. However, a comparison of the ambient noise levels at sites C1 and C2 revealed that the average root-mean-square (RMS) sound pressure levels (SPLs) in the 4-8 kHz and 8-16 kHz bands were 95.4 dB (S.D. = 1.7) and 95.4 dB (S.D. = 2.2), respectively at site C1, and 96.8 dB (S.D. = 1.8) and 96.3 dB (S.D. = 1.7), respectively at site C2. Although ambient noise levels were slightly higher at site C2, dolphin whistles were regularly detected there (see section 3.4.2 below), so it is unlikely that masking by noise at site C1 was the principal reason why whistle detections were absent at this location. Consequently, it can be assumed that dolphins likely do not produce many whistles at or near site C1 and that the amount of any noise masking is not greater than at site C2.

Approximately 54% of detections occurred during the nighttime period between 19:00 and 6:59 and 46% occurred during the day between 7:00 and 18:59. There were no distinct peaks in acoustic activity throughout the 24-period (Figure 20). Rather, there was a low level of acoustic activity during all hourly periods.

Figure 21 shows the root-mean-square (RMS) sound pressure level (SPL) in 1-octave bands and full bandwidth averaged hourly at site C1. The ambient noise level was highest in the 0-2 kHz frequency band, which was driven by vessel traffic, and lowest between 2-4 kHz. There was a sudden and unexpected decrease in the ambient noise levels between 2-32 kHz beginning on 5 October. It is presently unclear what caused this sudden change, but it may have resulted from either a perturbation of the nearby benthic fauna or a shift in sea surface conditions (see discussion below).

3.4.2. Site C2 – Between Lung Kwu Chau and Sha Chau

Dolphin signals were detected on all 30 days of EAR data that were recorded at site C2. Figure 22 shows the percentage of files for each day (288 recordings per day) that contained dolphin signals. Daily dolphin acoustic activity was variable, with between ~1% and 28% or recordings containing dolphin signals any given day. Figure 23 shows the number of dolphin encounters (as defined in section 2.4.3) and the mean duration of encounters for each day of the deployment period. There were a mean of 8.6 encounters per day (S.D. = 2.0) at site C2, which lasted a mean of 25.0 min (S.D. = 14.3).

Figure 24 shows the occurrence of dolphin acoustic signals in EAR recordings as a function of the hour of the day. Although the majority of detections at site C2 were of click trains, whistles were also regularly detected at this site. In addition, there was only a weak diel trend in the occurrence of detections, with approximately 53% of click train detections and 60% of whistle detections occurring during the nighttime period between 19:00 and 6:59. The peak number of detections occurred between 07:00 and 08:59.

Figure 25 shows the root-mean-square (RMS) sound pressure level (SPL) in 1-octave bands and full bandwidth averaged hourly at site C2. Average noise levels were within 3 dB re 1 μPa across all frequency bands between 0-32 kHz. However, SPLs in the 0-2 kHz band exhibited daily variations of up to 14 dB due to noise contributions from vessels and a biological evening chorus produced by one or more unknown species of fish and/or invertebrates. Overall, broadband noise levels above 2 kHz were higher at site C2 than at C1, but levels below 2 kHz were higher at C1 due to a greater daytime noise contribution from vessel traffic.

4. DISCUSSION

4.1. Underwater noise study (dipping hydrophone)

During this baseline phase of the study and throughout the study area, mean bandlevels of underwater noise were 116.71 ± 6.29 dB re 1 μPa for the "wideband" frequency range of 30 Hz to 40 kHz and 112.27 ± 6.36 dB re 1 μPa for the "dolphin-sensitive" frequency range of 400 Hz to 12.5 kHz. At greater than 100 dB, these bandlevels exceed levels of typical background ambient noise, whose source is primarily wind/waves and other environmental factors. Indeed, unlike other "ambient" noise measurements, no correlation was found between wind speed and sound levels since noise due to vessels and other anthropogenic sources masked that of wind-generated noise. With respect to studying local dolphins by passive acoustic means, these same high noise levels can also mask dolphin vocalizations and limit their detection range.

In addition to high baseline noise levels, temporal and spectral characteristics of sound in the study area varied greatly due to the high density of vessel traffic, fishing-related noise, and other anthropogenic activity that introduced transient noise throughout the day, especially during daylight hours.

4.2. Dolphin acoustic behavioural study (hydrophone)

The information obtained by focal follow hydrophone data collection yielded some anticipated and also some novel information about the acoustic activity of Chinese White Dolphins (CWD) in Hong Kong off North Lantau. CWD occur nearly daily in the study area, with approximately equal occurrence in both zones. As expected, acoustic activity tended to increase with group size and was highest during socializing periods. Larger groups have more animals that can contribute signals to recordings and it is common for delphinids to be more vocally active during periods of socializing (for example, Würsig et al. 1994; Brownlee and Norris 1994). Interestingly, there was a gradual rise in the click production rate throughout the day, peaking in the afternoon period between 14:00 and 15:59. This suggests that the afternoon could be a time of increased foraging or socializing for dolphins in this area. It is also very interesting to note that there was a large difference in the occurrence of whistling between Zones 1a (including the construction area) and 1b (to the west of the construction area). This suggests that, at least during daytime hours when the data were obtained, Zone 1a may be used differently than Zone 1b by the dolphins. A proportionately greater whistling rate in Zone 1b suggests more emphasis on social behaviors (Herzing 1996). On the other hand, clicking rates were equivalent between zones, suggesting that dolphin vigilance and foraging effort may be similar in the two zones.

The higher rates of whistling and clicking observed in the focal follow hydrophone data during the afternoon period between 14:00 and 16:59 are approximately consistent with the temporal patterns of acoustic activity observed on the EAR at C2 (near Lung Kwu Chau). This four-hour period corresponds to the higher number of afternoon sonar click detections, relative to the previous three hours. Although the peak of acoustic activity on EAR C2 was between 07:00 and 9:59, this was a time period with few sample points in the focal follow hydrophone database, so a direct comparison is not warranted.

4.3. Passive acoustic monitoring (EARs)

The EAR data indicate that dolphin acoustic activity is considerably greater at site C2 (near Lung Kwu Chau) than at site C1 (bridge alignment area). On average, 12.8% of files at site C2 per day contained dolphin detections, compared to only 1.6% of files per day at site C1. In addition, the mean number of daily encounters and the duration of encounters were greater at site C2 than at site C1. The day with the greatest number of detections at site C2 was 8 October 2013, with 28.1% of files containing dolphin detections. At site C1, the day with the most detections was 7 October 2013, with 4.5% files containing dolphin signals. Interestingly, there was an increase in dolphin detections at site C1 coincident with the sudden decrease in recorded noise levels in the 2-32 kHz band on 5 October. A likely explanation is that the lower noise levels resulted in an improvement in signal to noise ratio for dolphin signals, reducing the effects of masking and increasing the detection range. It is also interesting to note that more dolphin activity was recorded at site C2 despite higher ambient noise levels present there in the frequency band associated with dolphin signals (4-32 kHz) compared to site C1.

Dolphin detections at site C1 did not exhibit any temporal pattern of dolphin occurrence. At site C2, the main temporal features were the peak in detections occurring in the morning hours between 08:00 and 9:59, followed by a comparative lull in the mid-day hours between 11:00 and 13:59. The difference in both detection rates and temporal occurrence suggest that dolphins use sites C1 and C2 very differently. The lack of whistles recorded and the sparse detections at Site C1 is an indicator that the area is likely not used very much for socializing or regular foraging.

The drop in noise level in the 2-32 kHz band at site C1 on 5 October is somewhat puzzling. While we cannot completely rule out a hardware explanation without some testing of the EAR unit itself, there are telling factors that point to an alternative explanation. First, a manual spectral analysis of the data recorded before and after 5 October did not show any evidence of a sudden drop in instrument sensitivity, which would also be unprecedented in the more than seven years that EARs have been operational (M. Lammers, per. exp.). Second, while ambient RMS SPLs were lower, dolphin detections concurrently increased. This is inconsistent with a drop in instrument sensitivity, which would have resulted in fewer dolphin detections, not more. Consequently, a more plausible explanation is that the sources of mid- (2-16 kHz) and high frequency (16-32 kHz) noise in the area were in some way removed or suppressed. The greatest contributors to shallow water noise in the 2-32 kHz band are sounds generated from invertebrates (specifically, snapping shrimp), surface-breaking waves and rain.

Therefore, one or both of the following alternative explanations are plausible: 1) a local disturbance (e.g. a bottom trawler, large runoff event) substantially altered/affected the nearby benthic faunal composition, or 2) the days prior to 5 October were characterized by rain and/or surface breaking waves, which were not present during the remainder of the deployment period. Either or both events could result in the observed reduction in mid- and high frequency noise. However, in order to rule out the unlikely possibility of an instrument malfunction, the performance of the two EARs used for this work will be compared to one another in a mock deployment prior to the impact phase of the monitoring project. The two instruments will be co-located for a short, 24-hour recording period and the RMS SPLs of the resulting recordings will be calculated. If little (< 2 dB) or no difference is observed between the two instruments, it will be assumed that the EAR from C1 is functioning properly.

5. EVENT AND ACTION PLAN

According to Section 6.5 of the EM&A Manual, the Action and Limit Levels and event-action plan for ecology shall be proposed upon the baseline monitoring data, and agreed by AFCD and EPD. More specifically, as described in Table 6.9 of the EM&A Manual, the event-action plan should be triggered when dolphin numbers and behaviour patterns recorded in the construction and post-construction monitoring are significantly lower or different than those recorded in the pre-construction monitoring. Therefore, the Event and Action Plan should be developed to examine changes in the dolphin acoustic behaviour between baseline and impact phases of monitoring. Notably, such plan would not be needed for the underwater noise study, as it is not required by the EM&A Manual, and the mitigation measures including the 250-m dolphin exclusion zone during bored piling works as well as avoidance of the peak calving season of May and June for installation of metal caisson are already in place to keep the dolphins at a distance from the noise source of bored piling sites.

To develop the Event and Action Plan (EAP) on dolphin acoustic behaviour, we propose to take into account of the values of two response variables (clicking and whistling rates) as a function of the size of dolphin group, their behavioural state and time of day deduced from the calibrated hydrophone data as presented in Table 2. Departures of any of these variables between baseline and construction phases with a 20% difference will be of concern and should trigger the Action Level under the EAP. If a 40% difference in any of these variables between baseline and construction phases is detected, then the Limit Level under the EAP should be triggered and immediate actions will be required (see Table 3). The numerical values of these variables with the 20% and 40% differences are presented in Table 4.

Moreover, the response variable for the EAR data would be the diel occurrence at the two sites as shown in Figure 20 for Site C1 and Figure 24 for Site C2. However, there was no distinct diel pattern in acoustic activity of dolphins at Site C1, with 54% of detections occurred during the nighttime period between 19:00 and 6:59, and 46% occurred during the day between 7:00 and 18:59. Similarly, there was only a weak diel pattern in acoustic signal detection of dolphins at Site C2, with 53% of click train detections occurring during the nighttime period between 19:00 and 6:59. As there was no distinct peak occurrence of dolphins at Site C1, the shift of peak occurrence in acoustic signal detection cannot be used as triggering mechanism for the Event and Action Plan as in the HKLR09 bored piling monitoring programme.

Alternatively, we proposed that if there is a 20% difference in detections occurred during the nighttime period between 19:00 and 6:59 at Site C1 (baseline percentage of detection as 54%) in the impact phase monitoring period (i.e. ≥74% or ≤34% of all detections occurred at nighttime), then the Action Level should be triggered. On the other hand, if there is a 40% difference in detections occurred during the nighttime period between 19:00 and 6:59 at Site C1 in the impact phase monitoring period (i.e. ≥94% or ≤14% of all detections occurred at nighttime), then the Limit Level should be triggered. However, if such 20% or 40% difference occurs at both Sites C1 and C2 (baseline percentages of detections as 54% and 53% respectively), the action or limit level should not be triggered, as the change in diel pattern of dolphin occurrence does not only occur at the site of impact (C1) but also at the control site (C2), and the changes in dolphin occurrence at both sites may not be directly to the TM-CLKL construction works. Such review of data from Site C2 (control site between Lung Kwu Chau and Sha Chau) should be part of the review as listed in Action #2 by the ET Leader when the AL or LL is triggered as detailed in the Action and Event Plan (Table 3).

6. REFERENCE

Brownlee, S.M. and Norris, K.S. 1994. The acoustic domain. In: Norris, K.S., Würsig, B., Wells, R.S., and Würsig, M. The Hawaiian Spinner Dolphin. University of California Press, Berkeley, CA.

Herzing, D.L. 1996. Vocalizations and associated underwater behavior of free-ranging Atlantic spotted dolphins (*Stenella frontalis*) and bottlenose dolphins (*Tursiops truncatus*). Aquatic Mammals 22:61-79.

Hung, S. K. 2012. Monitoring of Marine Mammals in Hong Kong waters: final report (2011-12). An unpublished report submitted to the Agriculture, Fisheries and Conservation Department, 171 pp.

Hung, S. K. 2013. Monitoring of Marine Mammals in Hong Kong waters: final report (2012-13). An unpublished report submitted to the Agriculture, Fisheries and Conservation Department, 168 pp.

NMFS. 2003. Taking marine mammals incidental to conducting oil and gas activities in the Gulf of Mexico. U.S. Federal Register 68, pp. 9991–9996.

Lammers, M. O., Brainard, R. E., Au, W. W. L., Mooney, T. A. and Wong, K. 2008. An ecological acoustic recorder (EAR) for long-term monitoring of biological and anthropogenic sounds on coral reefs and other marine habitats. Journal of Acoustical Society of America 123: 1720-1728.

Piwetz, S., Hung, S.K., Wang J.Y., Lundquist, D. and Würsig, B. 2012. Influence of vessel traffic on movements of Indo-Pacific humpback dolphins (*Sousa chinensis*) off Lantau Island, Hong Kong. Aquatic Mammals 38: 325-331.

Sims, P. Q., Vaughn, R., Hung, S. K. and Würsig, B. 2011. Sounds of Indo-Pacific humpback dolphins (*Sousa chinensis*) in West Hong Kong: A preliminary description. Journal of the Acoustical Society of America, EL48-EL53 (doi: 10.1121/1.3663281).

Sims, P., Hung, S. K. and Würsig, B. 2012. High-speed vessel sounds in West Hong Kong waters and their contributions relative to Indo-Pacific humpback dolphins (*Sousa chinensis*). Journal of Marine Biology Volume 2012: Article ID 169103, 11 pages (doi: 10.1155/2012/169103).

Würsig, B. and Evans, P. G. H. 2001. Cetaceans and humans: influence of noise. In: Evans, P. G. H. and Raga, J. A (editors). Marine Mammals: Biology and Conservation. Kluwer Academic/Plenum Press, New York, pp. 565-587.

Würsig, B. and Greene, C. R., Jr. 2002. Underwater sounds near a fuel receiving facility in western Hong Kong: relevance to dolphins. Marine Environmental Research 54: 129–145.

Würsig, B., Greene, C. R., Jr., and Jefferson, T. A. 2000. Development of an air bubble curtain to reduce underwater noise of percussive piling. Marine Environmental Research 49: 79-93.

Würsig, B., Lynn, S. K., Jefferson, T. A. and Mullin, K. D. 1998. Behavior of cetaceans in the northern Gulf of Mexico relative to survey ships and aircraft. Aquatic Mammals 24: 41-50.

Würsig, B. and Richardson, W. J. 2009. Noise, effects of. In: Perrin, W. F., Würsig, B. and Thewissen, J. G. M. (editors). The Encyclopedia of Marine Mammals (second edition). Academic Press, Amsterdam, pp. 765-772.

Würsig, B., Wells, R.S., Norris, K.S., and Würsig, M. A spinner dolphin's day. In: Norris, K.S., Würsig, B., Wells, R.S., and Würsig, M. The Hawaiian Spinner Dolphin. University of California Press, Berkeley, CA.

Table 1. Mean bandlevels as a function of distance from proposed bored piling pier locations for the baseline study phase.

Range (m)	**Mean Bandlevel ± s.d. (dB re 1 µPa)**	
	Wideband: 30 Hz – 40 kHz	**Dolphin Band: 400 Hz – 12.5 kHz**
0	113.98 ± 3.98	107.43 ± 4.95
10	112.59 ± 2.78	107.70 ± 2.76
20	113.93 ± 3.54	107.19 ± 4.09
50	113.78 ± 4.17	108.75 ± 5.98
100	115.28 ± 4.57	107.40 ± 4.16
200	115.75 ± 3.67	109.82 ± 5.10
300	115.22 ± 4.19	108.33 ± 4.98
500	113.37 ± 3.58	106.20 ± 2.84

Table 2. Values of the two response variables of dolphin acoustic behaviour collected by calibrated hydrophone (mean clicks and whistles per minutes) by size of group, behavioural state and time of day during baseline period

	Mean number of clicks per minute (± s.d.)	Mean number of whistles per minute (± s.d.)
Group Size		
1 dolphins	169.74 ± 194.88 (n=10)	2.89 ± 5.21 (n=10)
2-5 dolphins	161.46 ± 160.61 (n=86)	3.14 ± 6.54 (n=86)
6-9 dolphins	207.25 ± 157.17 (n=35)	5.64 ± 9.91 (n=35)
Behavioural State		
Feeding	165.09 ± 118.49 (n=18)	2.71 ± 6.67 (n=18)
Milling	183.73 ± 182.09 (n=123)	3.83 ± 7.63 (n=123)
Socializing	294.63 ± 159.98 (n=4)	3.05 ± 3.33 (n=4)
Traveling	119.98 ± 81.82 (n=22)	4.98 ± 8.77 (n=22)
Time of day		
08:00-09:59	100.83 ± 77.23 (n=5)	2.30 ± 4.35 (n=5)
10:00-11:59	155.65 ± 120.40 (n=35)	4.77 ± 9.59 (n=35)
12:00-13:59	171.08 ± 149.02 (n=52)	2.08 ± 5.08 (n=52)
14:00-15:59	218.49 ± 241.38 (n=27)	3.88 ± 5.77 (n=27)
16:00-17:59	186.40 ± 122.57 (n=11)	7.82 ± 11.83 (n=11)

Table 3. Event and Action Plan on Dolphin Acoustic Behaviour

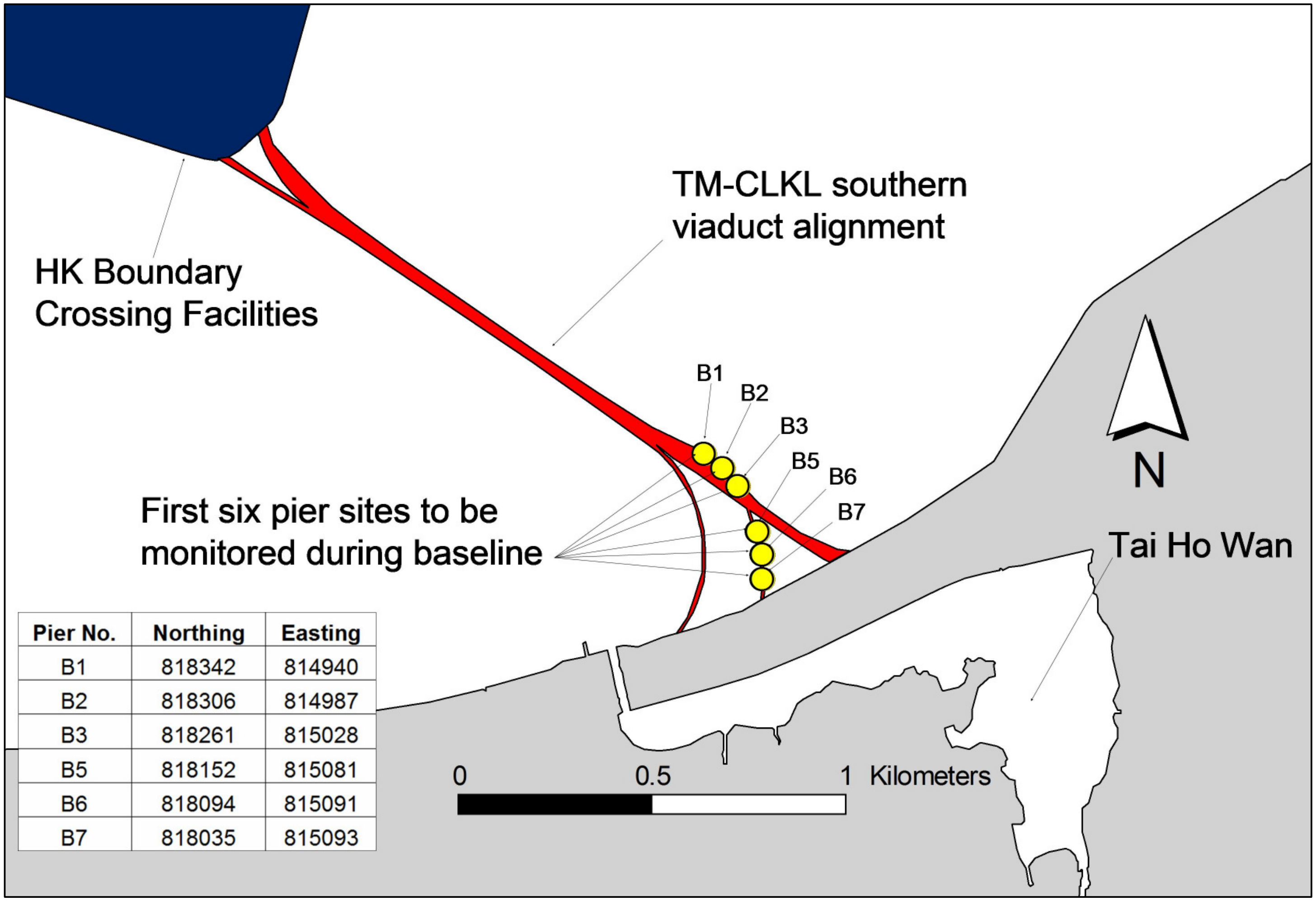
EVENT	ACTION			
	ET Leader	**IEC**	**SO**	**Contractor**
Action Level With the numerical values presented in Table 2, when any of the response variable for dolphin acoustic behaviour recorded in the construction phase monitoring is 20% lower or higher than that recorded in the baseline monitoring (see Table 4), or when there is a difference of 20% in dolphin acoustic signal detection at nighttime period at Site C1, the action level should be triggered	1. Repeat statistical data analysis to confirm findings; 2. Review all available and relevant data to ascertain if differences are as a result of natural variation or seasonal differences; 3. Identify source(s) of impact; 4. Inform the IEC, SO and Contractor; 5. Check monitoring data; 6. Carry out audit to ensure all dolphin protective measures are implemented fully and additional measures be proposed if necessary	1. Check monitoring data submitted by ET and Contractor; 2. Discuss monitoring with the ET and the Contractor;	1. Discuss with the IEC the repeat monitoring and any other measures proposed by the ET; 2. Make agreement on measures to be implemented.	1. Inform the SO and confirm notification of the non-compliance in writing; 2. Discuss with the ET and the IEC and propose measures to the IEC and the SO; 3. Implement the agreed measures.
Limit Level With the numerical values presented in Table 2, when any of the response variable for dolphin acoustic behaviour recorded in the construction phase monitoring is 40% lower or higher than that recorded in the baseline monitoring (see Table 4), or when there is a difference of 40% in dolphin acoustic signal detection at nighttime at Site C1, the limit level should be triggered	1. Repeat statistical data analysis to confirm findings; 2. Review all available and relevant data to ascertain if differences are as a result of natural variation or seasonal differences; 3. Identify source(s) of impact; 4. Inform the IEC, SO and Contractor; 5. Check monitoring data; 6. Carry out audit to ensure all dolphin protective measures are implemented fully and additional measures be proposed if necessary 7. Discuss additional dolphin monitoring and any other potential mitigation measures (e.g. consider to temporarily stop relevant portion of construction activity) with the IEC and Contractor.	1. Check monitoring data submitted by ET and Contractor; 2. Discuss monitoring with the ET and the Contractor; 3. Review proposals for additional monitoring and any other measures submitted by the Contractor and advise ER accordingly.	1. Discuss with the IEC the repeat monitoring and any other measures proposed by the ET; 2. Make agreement on measures to be implemented.	1. Inform the SO and confirm notification of the non-compliance in writing; 2. Discuss with the ET and the IEC and propose measures to the IEC and the SO; 3. Implement the agreed measures.

Abbreviations: ET – Environmental Team, IEC – Independent Environmental Checker, SO – Supervising Office

Table 4. Values of action level (AL) and limit level (LL) for all response variables by size of group, behavioural state and time of day

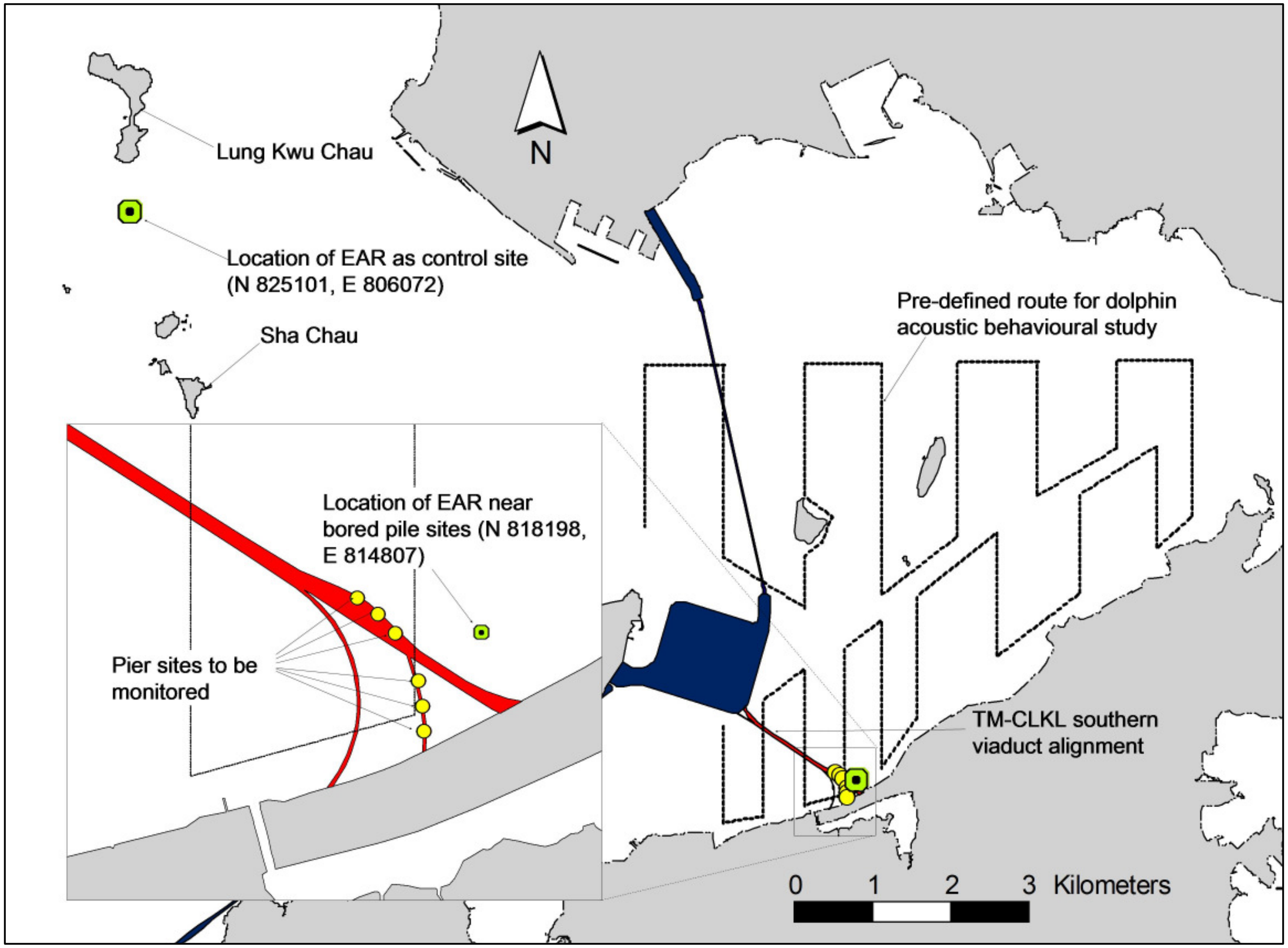
	Mean no. of clicks per minute	Mean no. of whistles per minute
Group Size	AL / LL	AL / LL
1 dolphins (20%/40% ***lower***)	135.79 / 101.84	2.31 / 1.73
1 dolphins (20%/40% ***higher***)	203.69 / 237.64	3.47 / 4.05
2-5 dolphins (20%/40% ***lower***)	129.17 / 96.88	2.51 / 1.88
2-5 dolphins (20%/40% ***higher***)	193.75 / 226.04	3.77 / 4.40
6-9 dolphins (20%/40% ***lower***)	165.80 / 124.35	4.51 / 3.38
6-9 dolphins (20%/40% ***higher***)	248.70 / 290.15	6.77 / 7.90
Behavioural State	AL / LL	AL / LL
Feeding (20%/40% ***lower***)	132.07 / 99.05	2.17 / 1.63
Feeding (20%/40% ***higher***)	198.11 / 231.13	3.25 / 3.79
Milling (20%/40% ***lower***)	146.98 / 110.24	3.06 / 2.30
Milling (20%/40% ***higher***)	220.48 / 257.22	4.60 / 5.36
Socializing (20%/40% ***lower***)	235.70 / 176.78	2.44 / 1.83
Socializing (20%/40% ***higher***)	353.56 / 412.48	3.66 / 4.27
Traveling (20%/40% ***lower***)	95.98 / 71.99	3.98 / 2.99
Traveling (20%/40% ***higher***)	143.98 / 167.97	5.98 / 6.97
Time of day	AL / LL	AL / LL
08:00-09:59 (20%/40% ***lower***)	80.66 / 60.50	1.84 / 1.38
08:00-09:59 (20%/40% ***higher***)	121.00 / 141.16	2.76 / 3.22
10:00-11:59 (20%/40% ***lower***)	124.52 / 93.39	3.82 / 2.86
10:00-11:59 (20%/40% ***higher***)	186.78 / 217.91	5.72 / 6.68
12:00-13:59 (20%/40% ***lower***)	136.86 / 102.65	1.66 / 1.25
12:00-13:59 (20%/40% ***higher***)	205.30 / 239.51	2.50 / 2.91
14:00-15:59 (20%/40% ***lower***)	174.79 / 131.09	3.10 / 2.33
14:00-15:59 (20%/40% ***higher***)	262.19 / 305.89	4.66 / 5.43
16:00-17:59 (20%/40% ***lower***)	149.12 / 111.84	6.26 / 4.69
16:00-17:59 (20%/40% ***higher***)	223.68 / 260.96	9.38 / 10.95

Figure 1. Location of the bored pile pier sites to be monitored for the underwater noise measurement study of TM-CLKL construction



Pier No.	Northing	Easting
B1	818342	814940
B2	818306	814987
B3	818261	815028
B5	818152	815081
B6	818094	815091
B7	818035	815093

Figure 2. Map showing the locations of two EAR deployments, pier sites to be monitored as well as pre-defined route for dolphin acoustic behavioural study



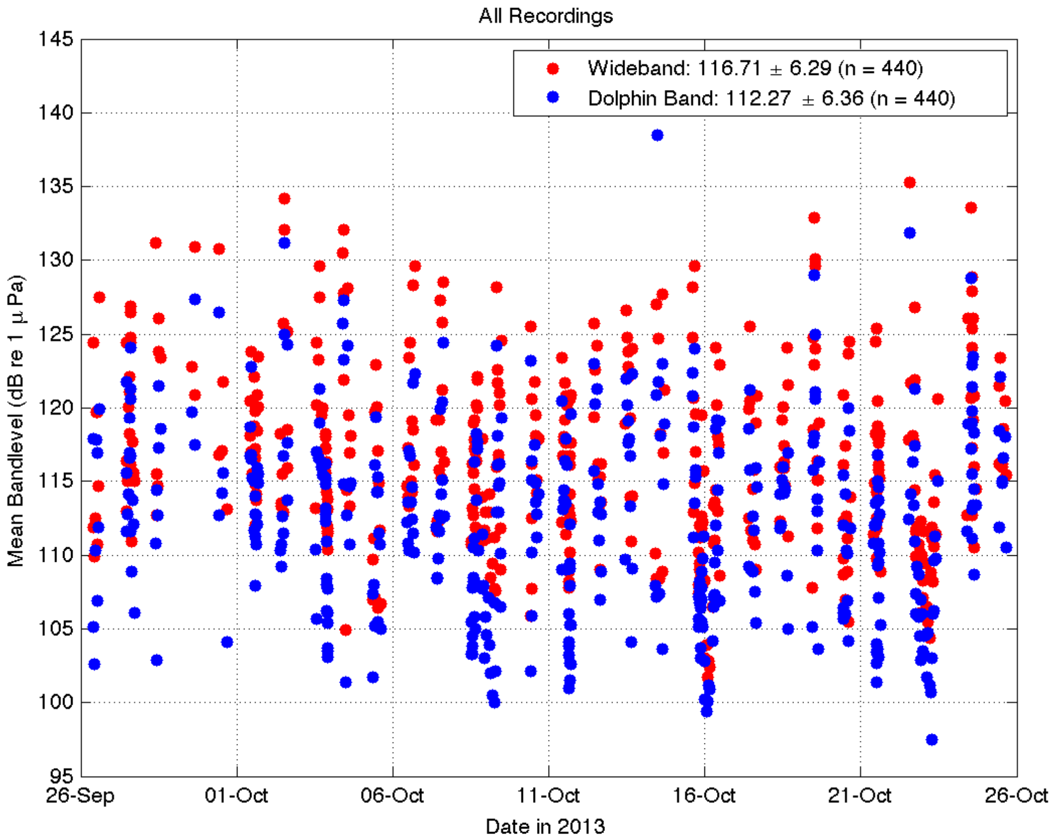


Figure 3. Mean bandlevels for all 440 recordings. Bandlevels were analyzed in terms of both the 30–40,000 Hz "wideband" frequency range (red) and 400–12,500 Hz "dolphin-sensitive" band (blue) and then averaged over the duration of each recording.

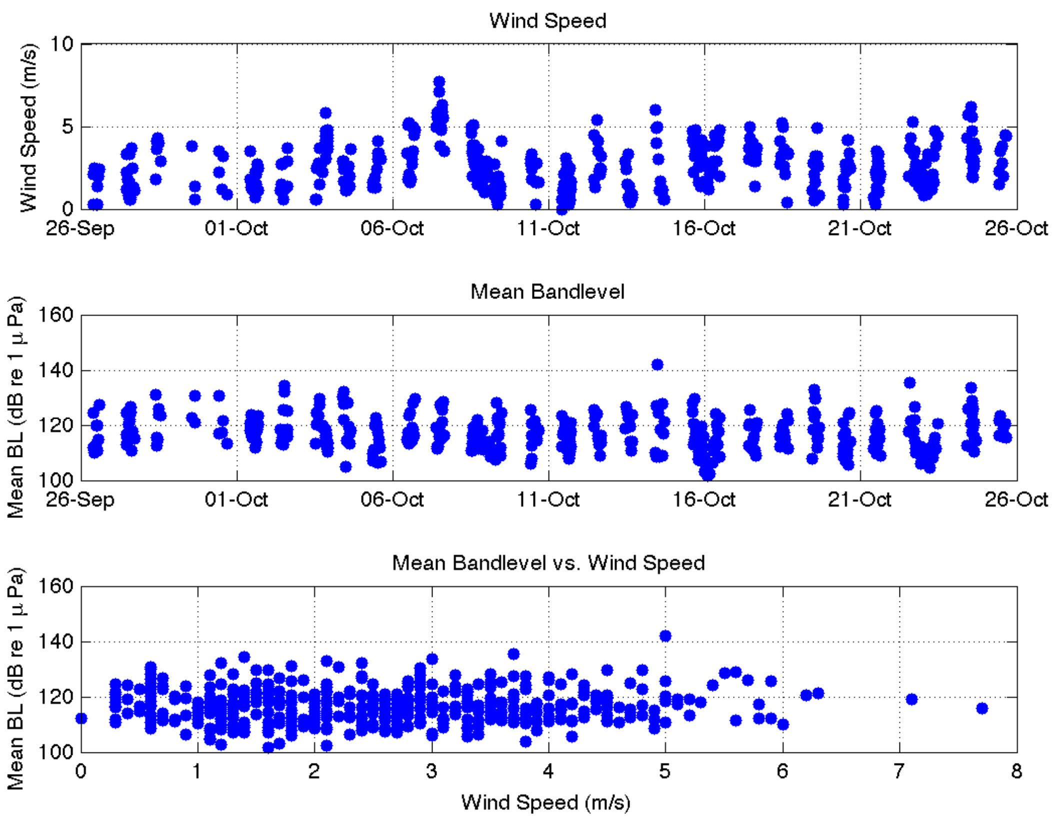


Figure 4. Received sound levels in relation to wind speed: wind speeds measured during each recording (top plot), mean bandlevels for each recording (middle plot), and mean bandlevels as a function of wind speed (bottom plot).

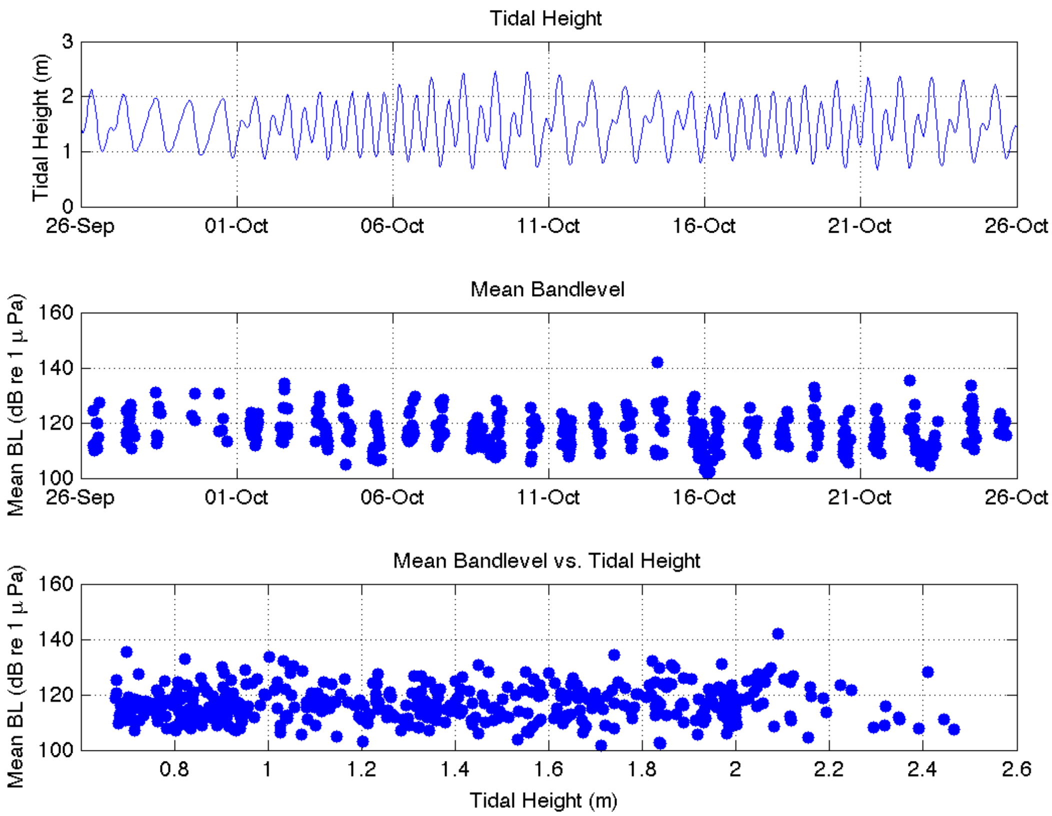


Figure 5. Received sound levels in relation to tidal height: tidal height throughout the study (top plot), mean bandlevels for each recording (middle plot), and mean bandlevels as a function of tidal height (bottom plot).

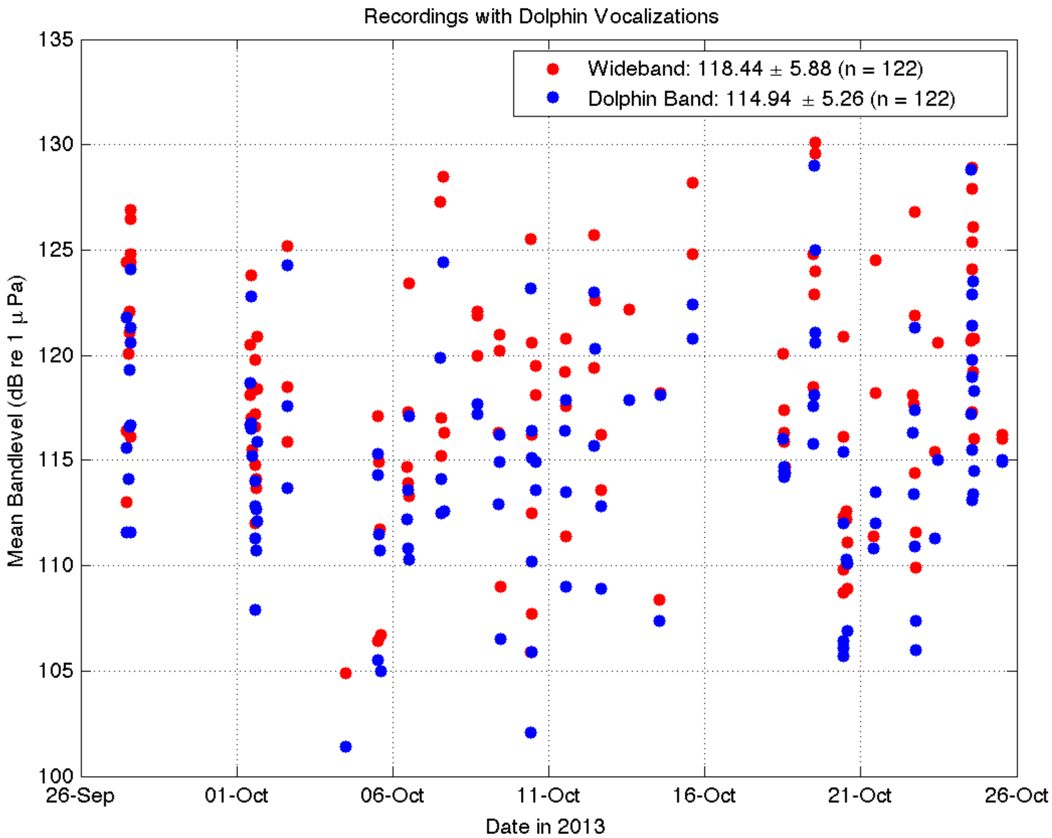


Figure 6. Mean bandlevels for the 122 recordings containing dolphin vocalizations. Bandlevels were analyzed in terms of both the 30–40,000 Hz "wideband" frequency range (red) and 400–12,500 Hz "dolphin-sensitive" band (blue). Note that the mean bandlevel was calculated across the entire recording, regardless of the duration of detected dolphin vocalizations.

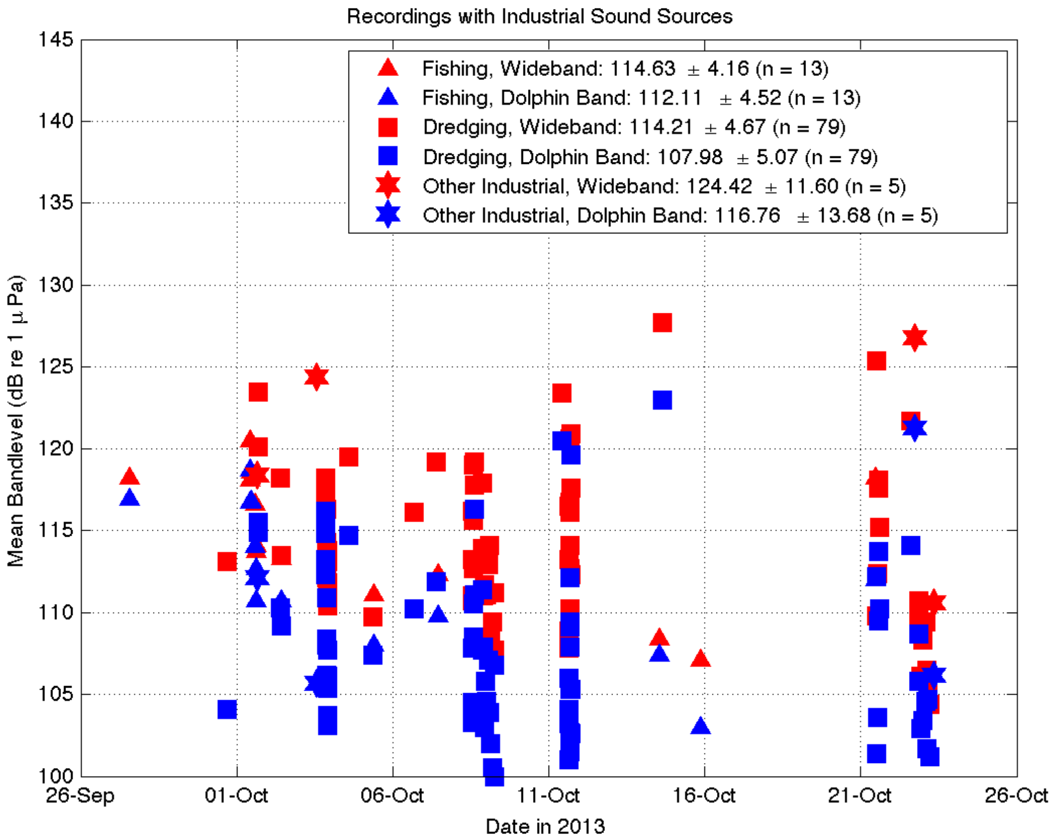


Figure 7. Mean bandlevels for recordings with documented, actively operating, industrial sound sources: fishing activity (triangles), dredging (squares), and other general industrial activity (stars) Red and blue represent the 30–40,000 Hz "wideband" frequency range and 400–12,500 Hz "dolphin-sensitive" band, respectively. Note that the mean bandlevel was calculated across the entire recording, and, thus, bandlevels may represent other concurrent sound sources.

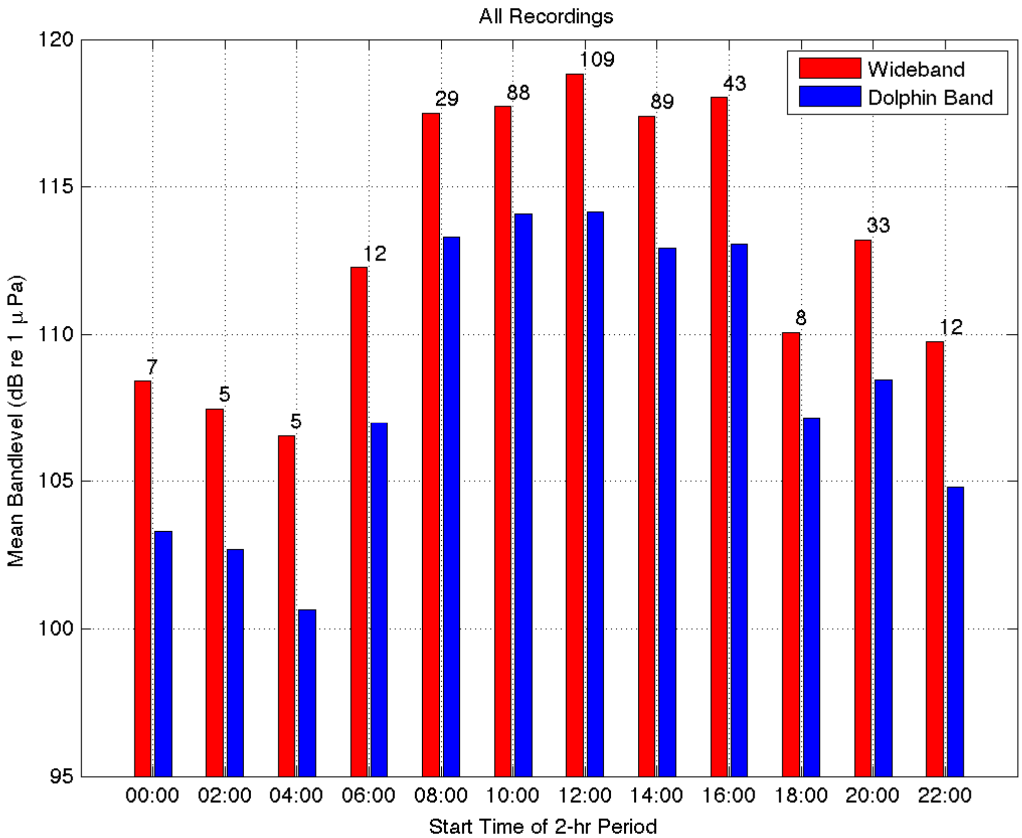


Figure 8. Mean bandlevels for all 440 recordings as a function of time of day. Red and blue represent the 30–40,000 Hz "wideband" frequency range and 400–12,500 Hz "dolphin-sensitive" band, respectively.

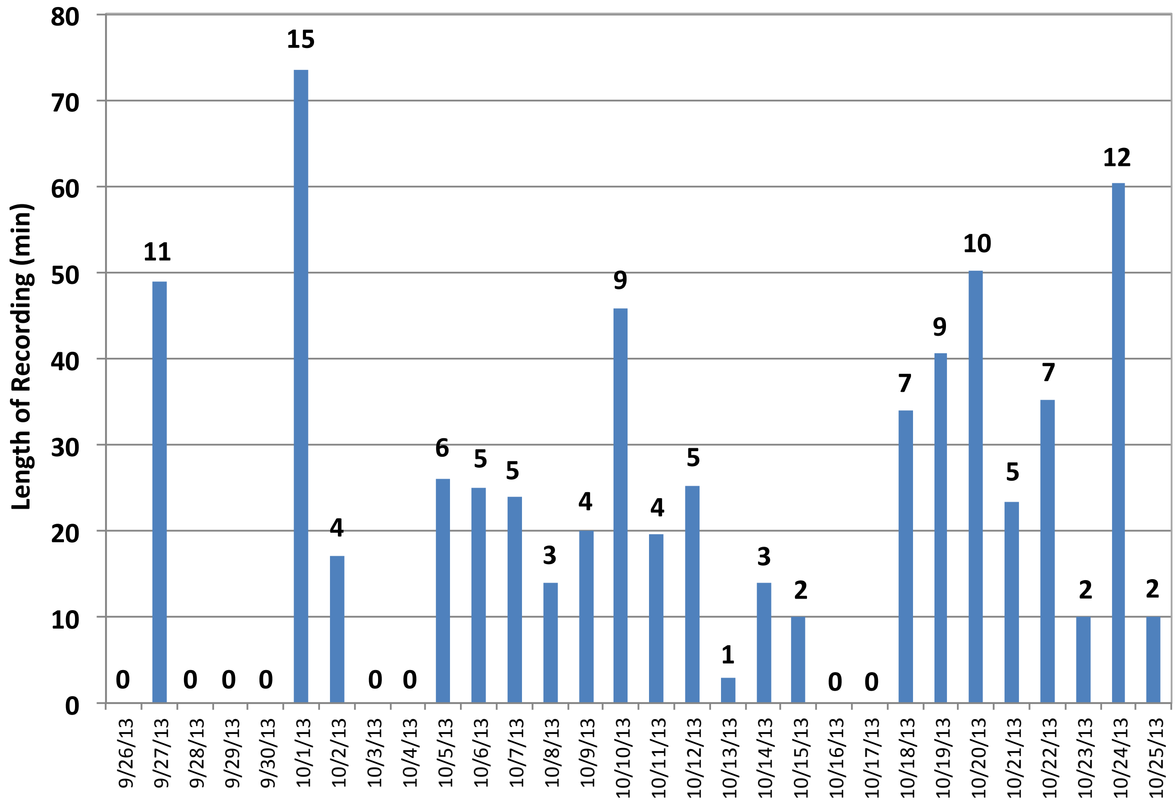


Figure 9. The summed length of recordings in minutes made for each day of observational effort during the baseline acoustic monitoring in September-October 2013. The values above each column represent the number of 5-minute recordings per day.

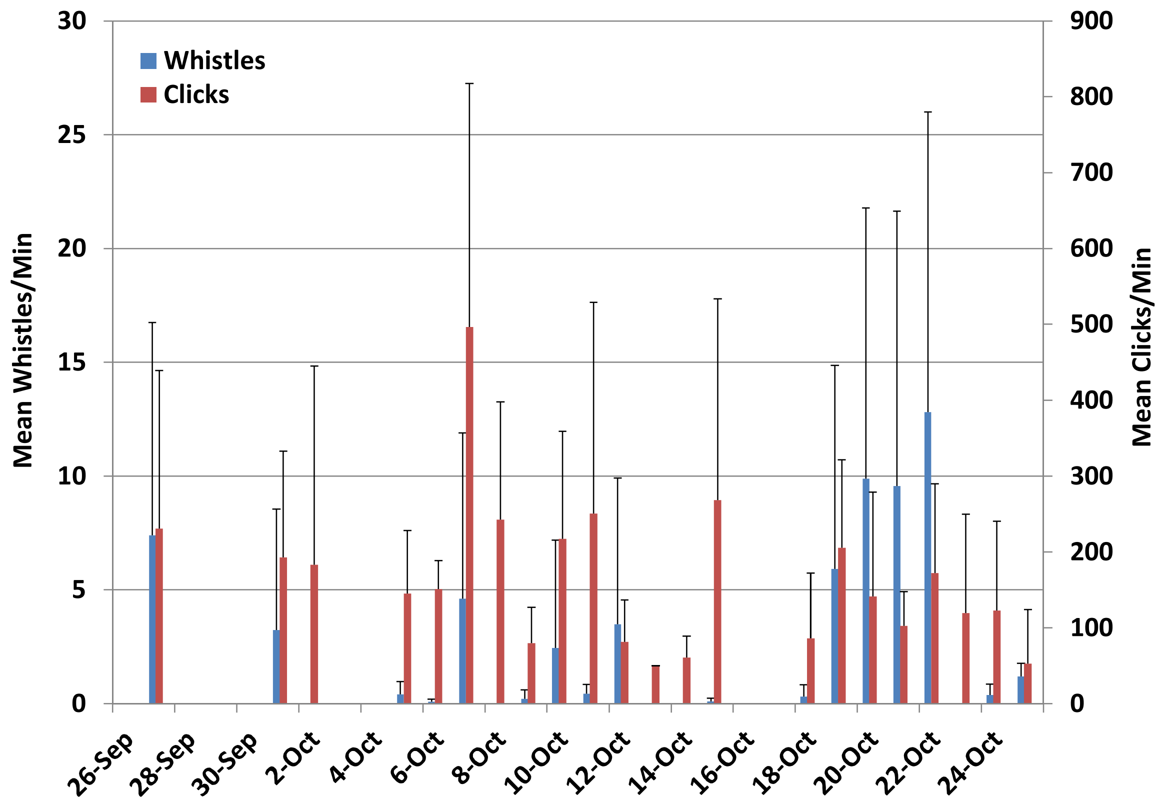


Figure 10. The mean number of clicks and whistles per minute of recording detected for each day of observational effort. Errors bars represent one standard deviation.

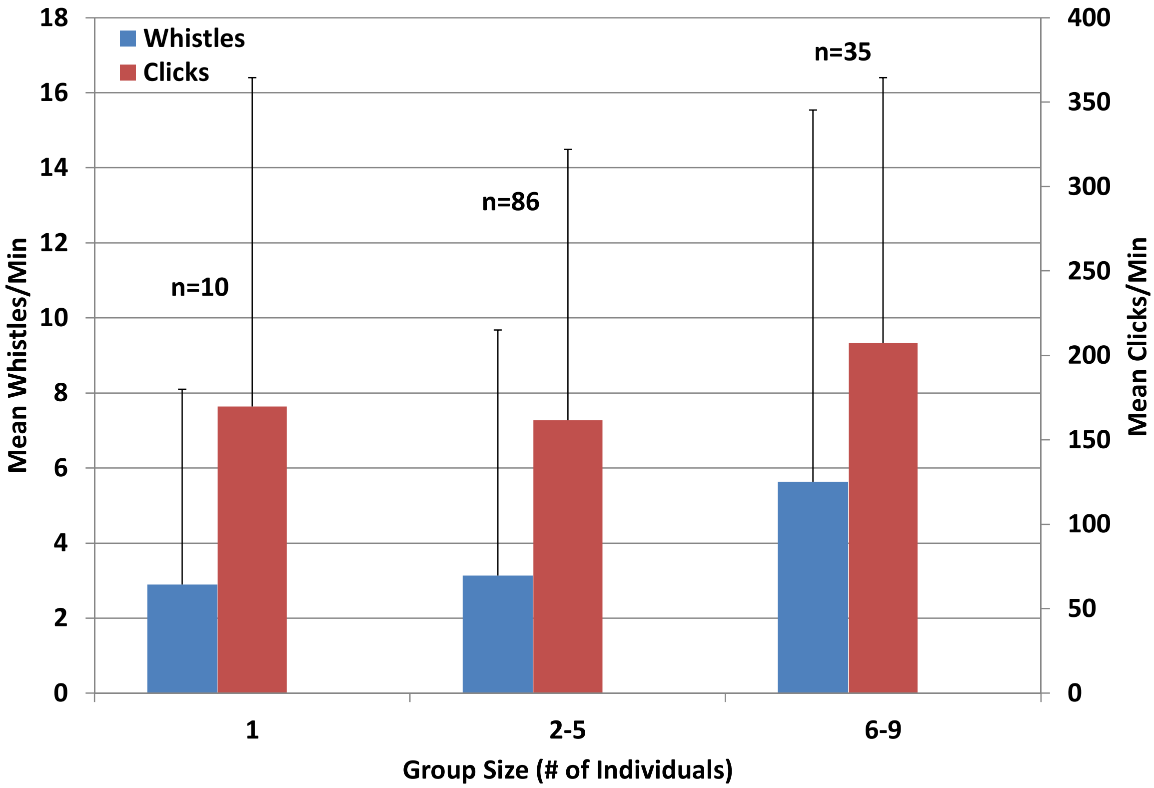


Figure 11. Mean number of whistles per minute and clicks per minute recorded as a function of dolphin group size. Error bars represent one standard deviation.

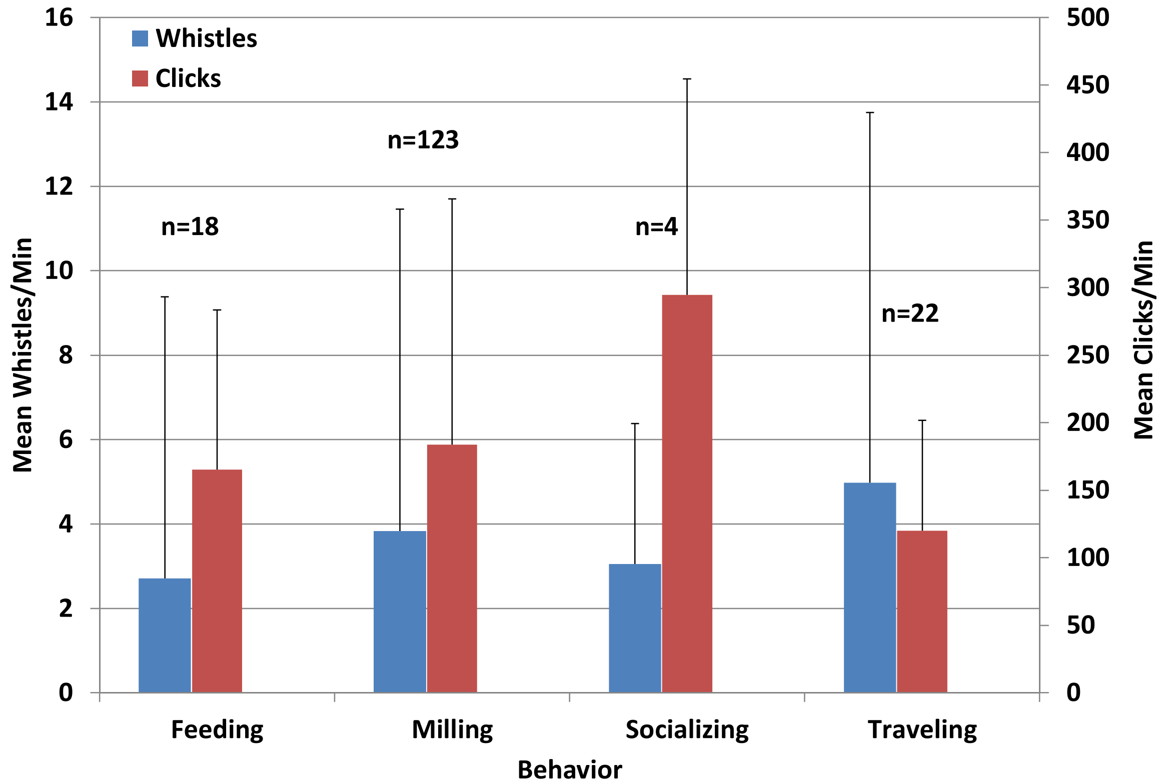


Figure 12. Mean number of whistles per minute and clicks per minute recorded as a function of dolphin behavioural state. Error bars represent one standard deviation.

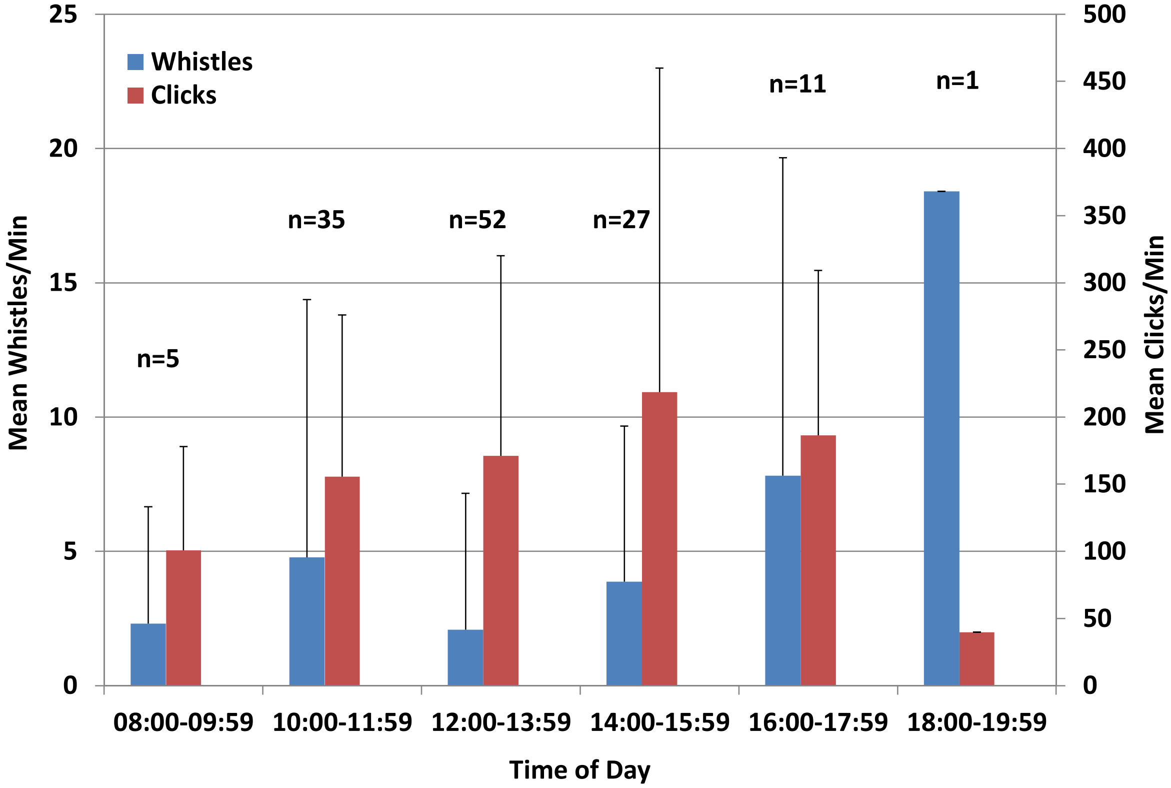


Figure 13. Mean number of whistles per minute and clicks per minute recorded as a function of the time of day. Error bars represent one standard deviation.

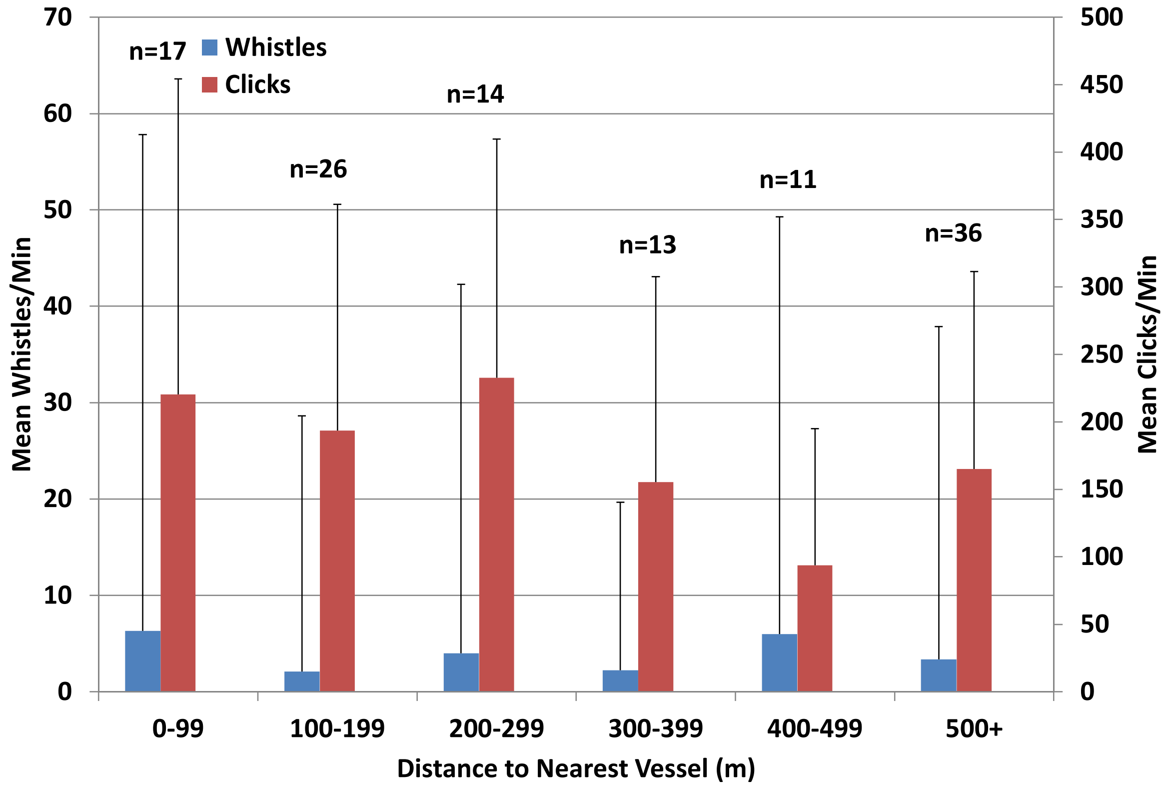


Figure 14. Mean number of whistles per minute and clicks per minute recorded as a function of the distance to the nearest vessel. Error bars represent one standard deviation.

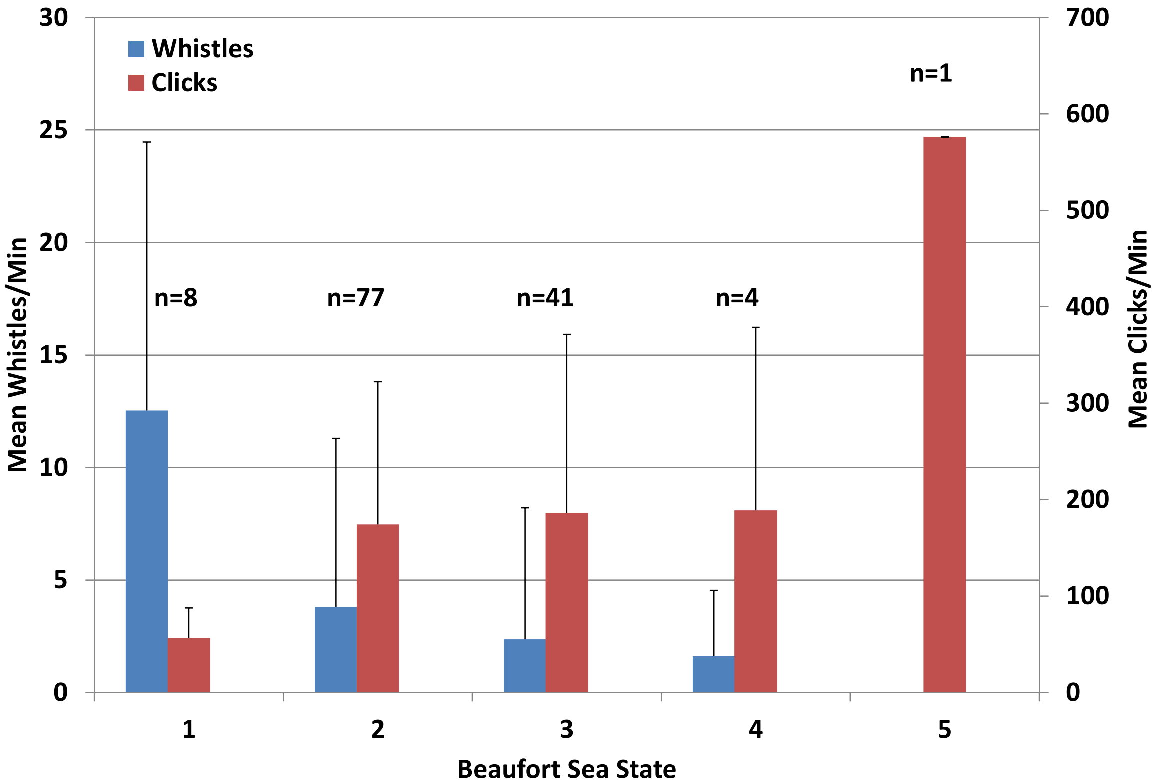


Figure 15. Mean number of clicks per minute and whistles per minute recorded as a function of the Beaufort Sea State. Error bars represent one standard deviation.

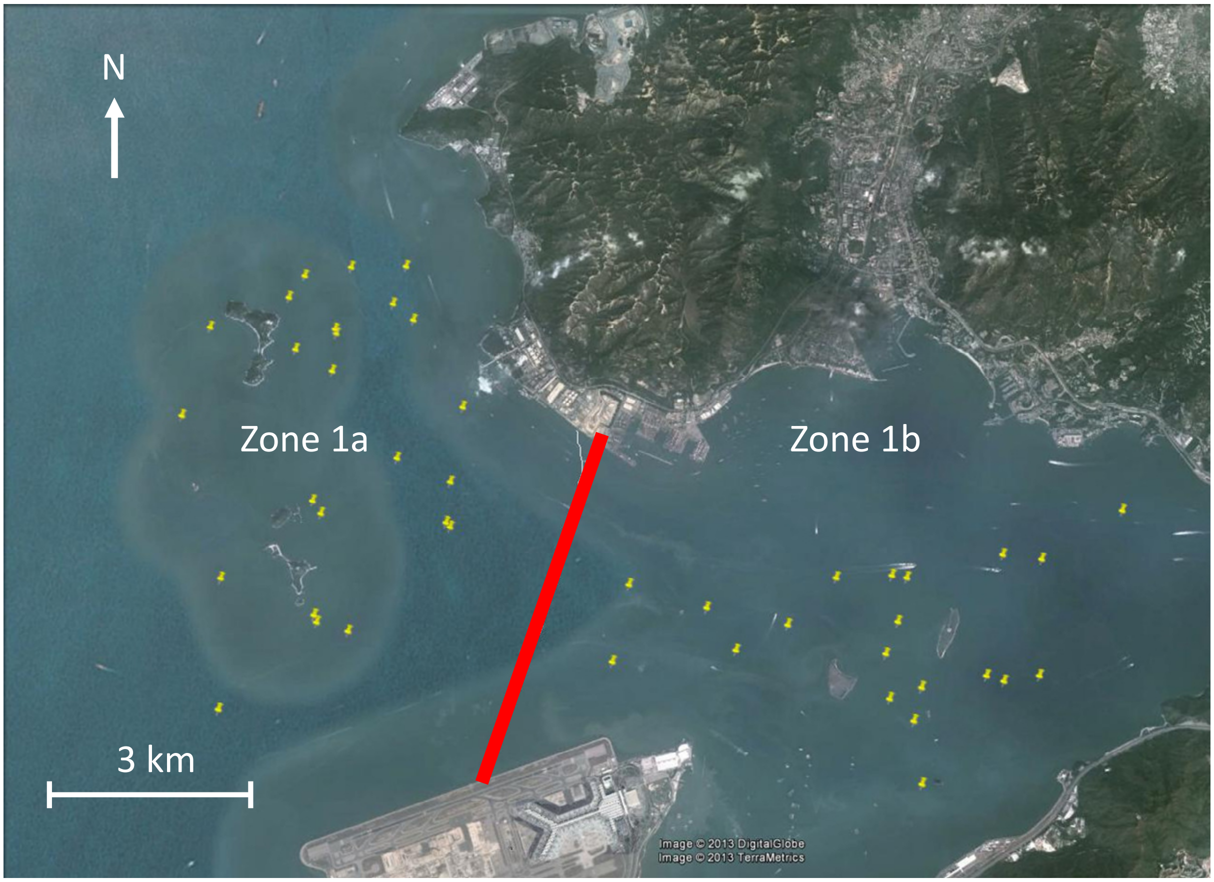


Figure 16. The location of the first recordings made for each sighting for each day of observational effort. Place marks represent GPS coordinates. The red solid line designates the boundary of two study zones. Map generated in Google Earth 7.0.3.8542.

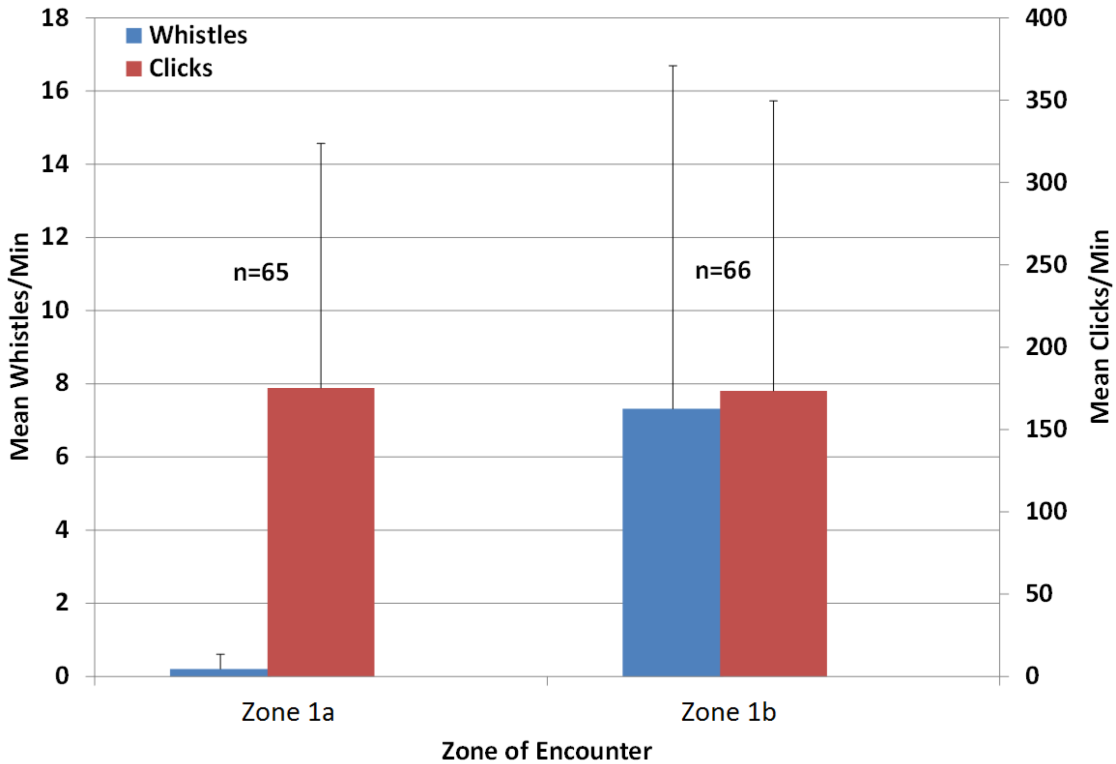


Figure 17. Mean number of whistles per minute and clicks per minute recorded in each zone of the study area. Error bars represent one standard deviation.

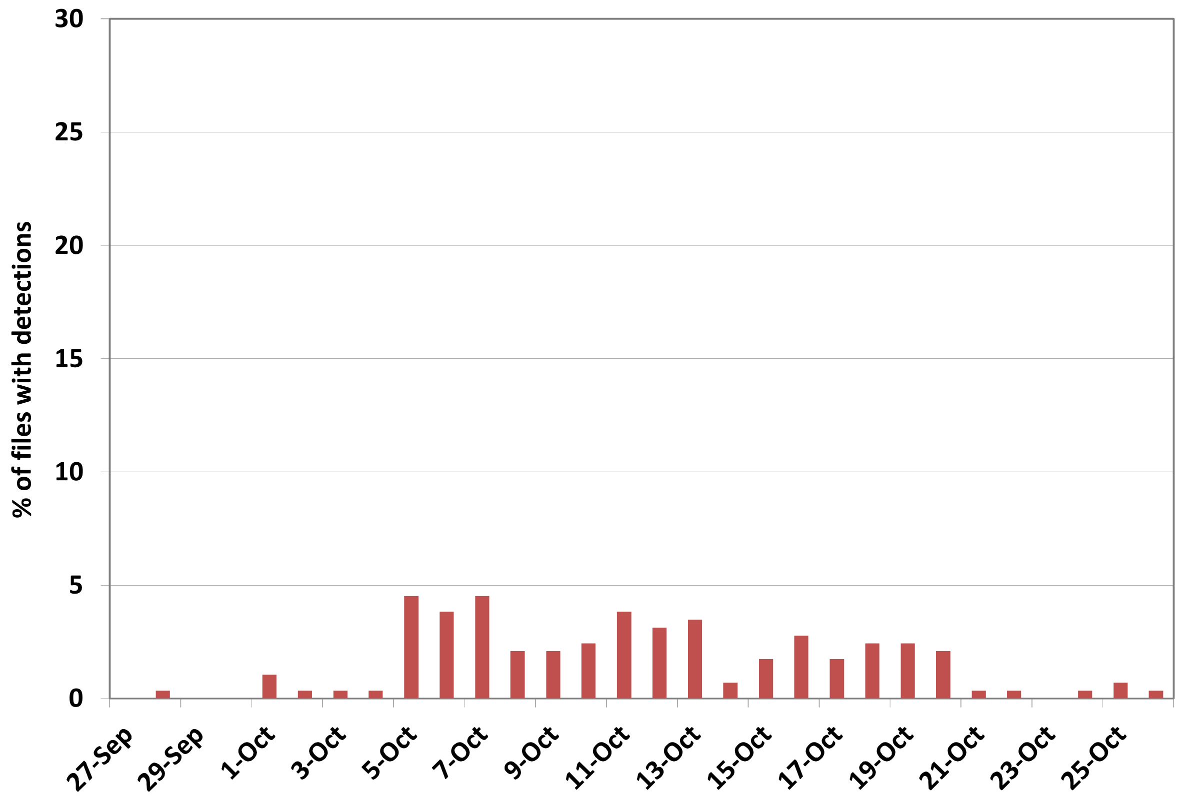


Figure 18. Histogram of the percentage of EAR recordings with dolphin detections made at site C1 (Bridge Alignment Area) during 30 days of the deployment period.

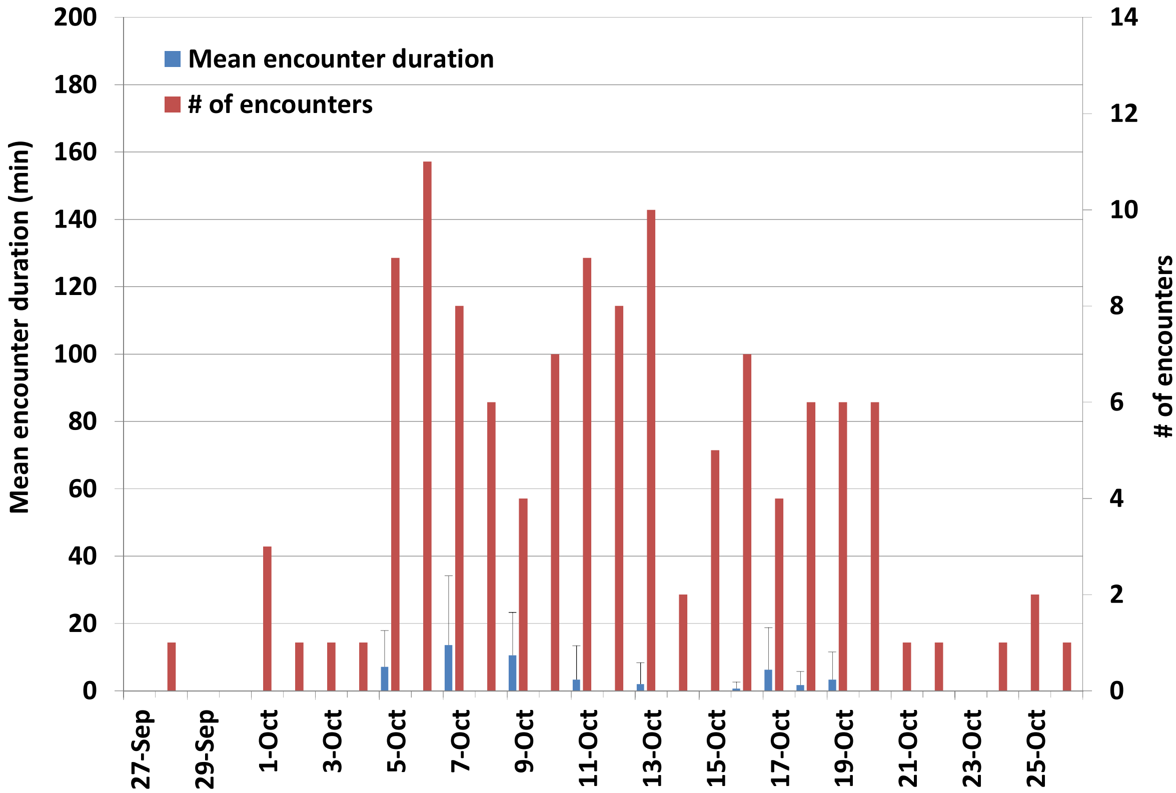


Figure 19. The number of dolphin encounters and the mean encounter duration for each day recorded on the EAR at site C1 (Bridge Alignment Area). Error bars represent one standard deviation.

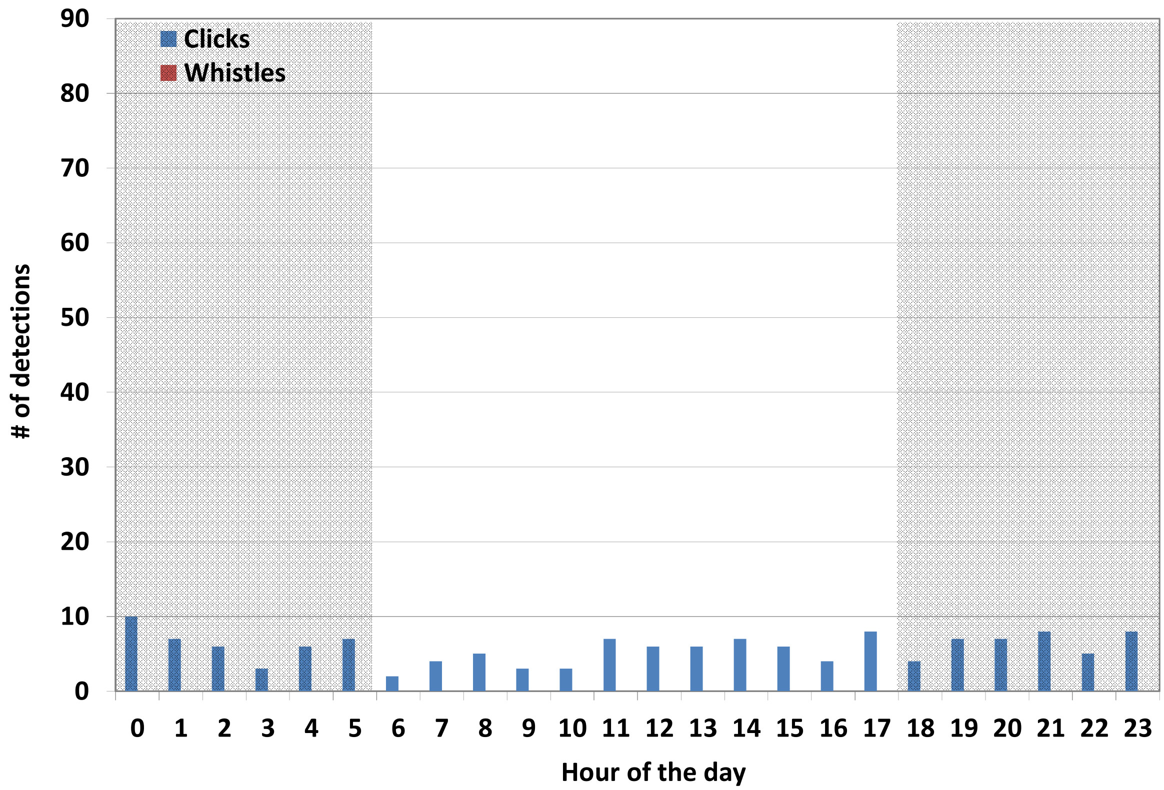


Figure 20. Detections of dolphin signals at site C1 (Bridge Alignment Area) as a function of the hour of the day. Values are the total number of detections in each hour across the entire monitoring period.

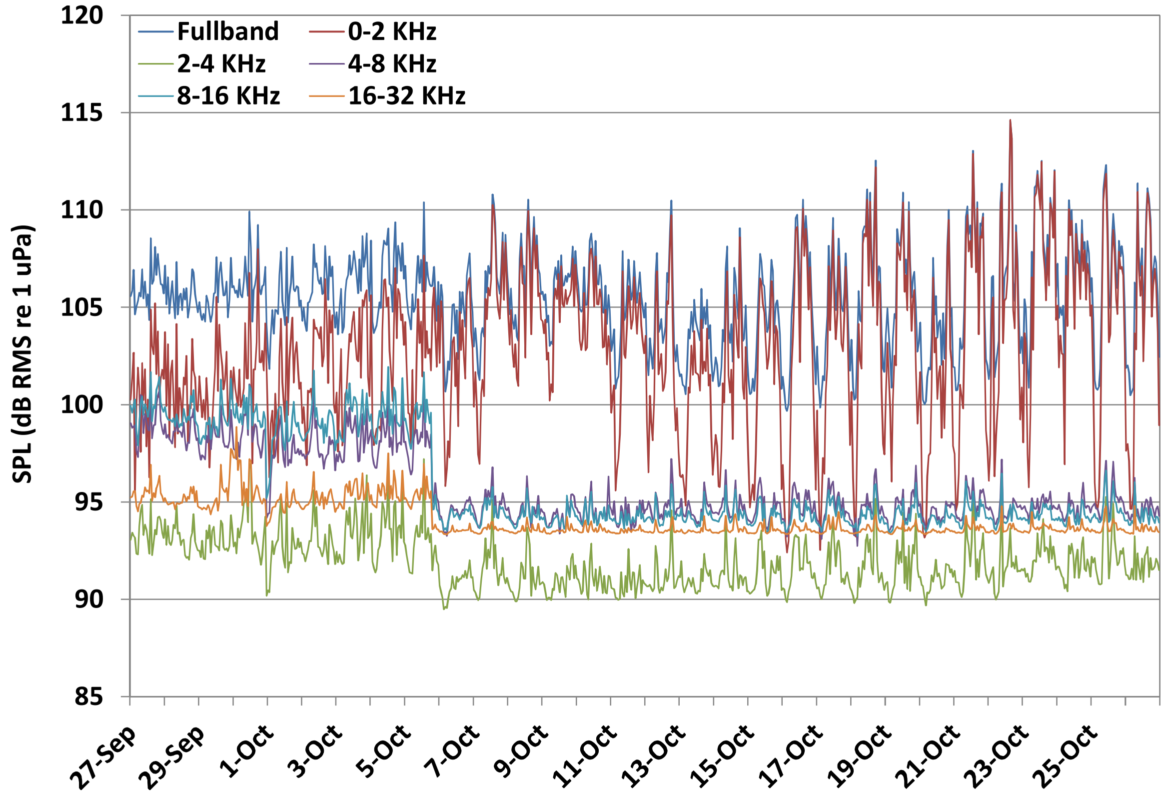


Figure 21. Root-mean-square (RMS) sound pressure level (SPL) in 1-octave bands and full bandwidth averaged hourly over the deployment period at site C1 (Bridge Alignment Area).

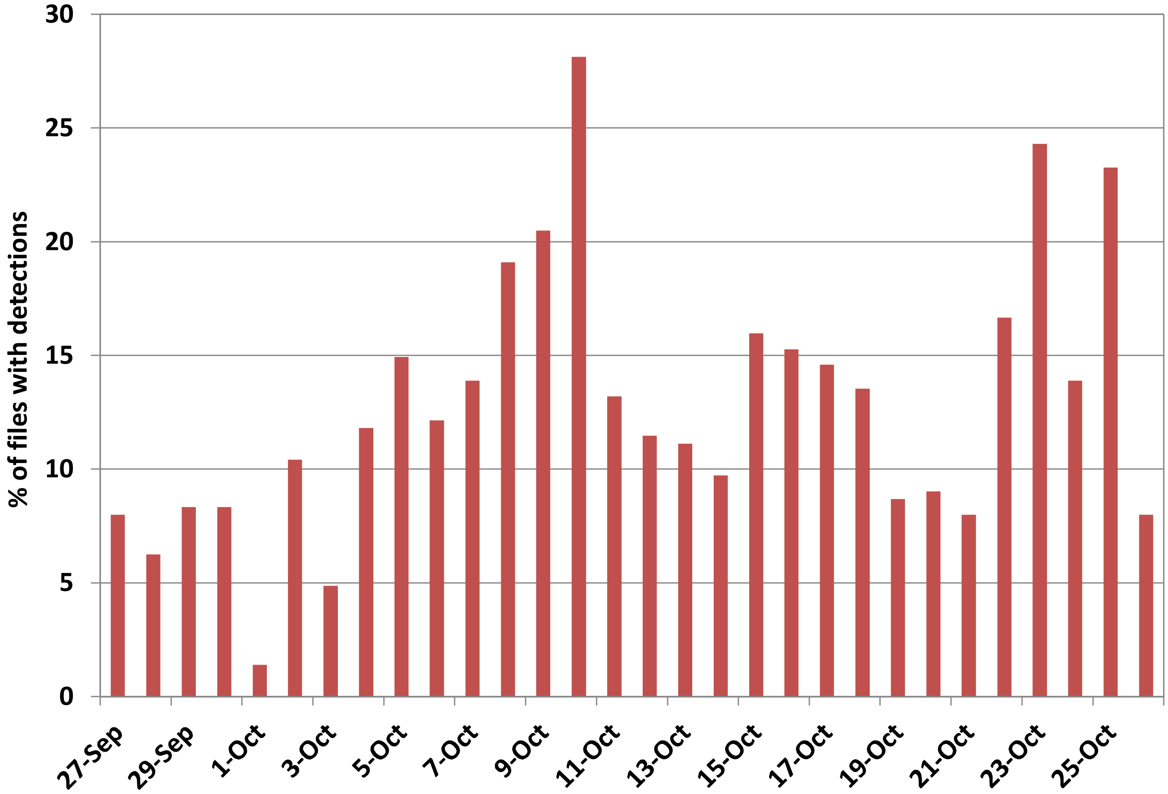


Figure 22. Histogram of the percentage of EAR recordings at site C2 (near Lung Kwu Chau), with dolphin detections made during 30 days of the deployment period.

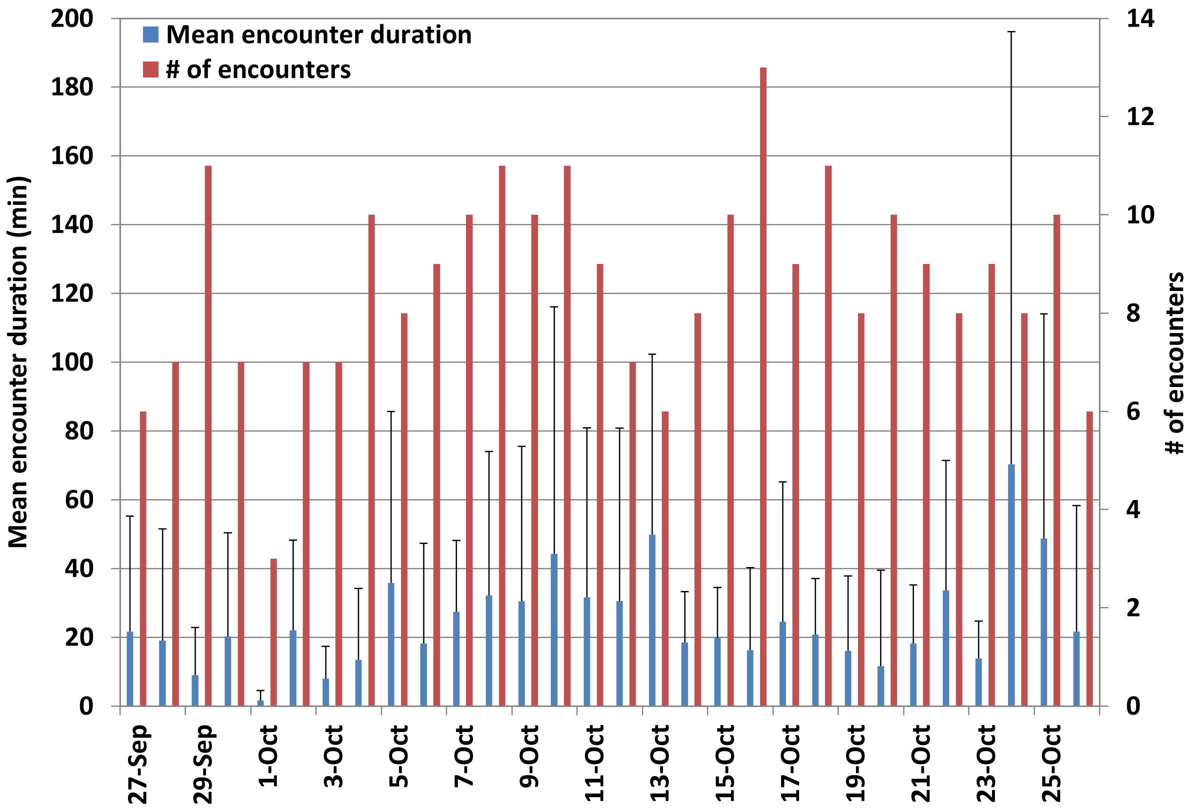


Figure 23. The number of dolphin encounters and the mean encounter duration for each day recorded on the EAR at site C2 (near Lung Kwu Chau). Error bars represent one standard deviation.

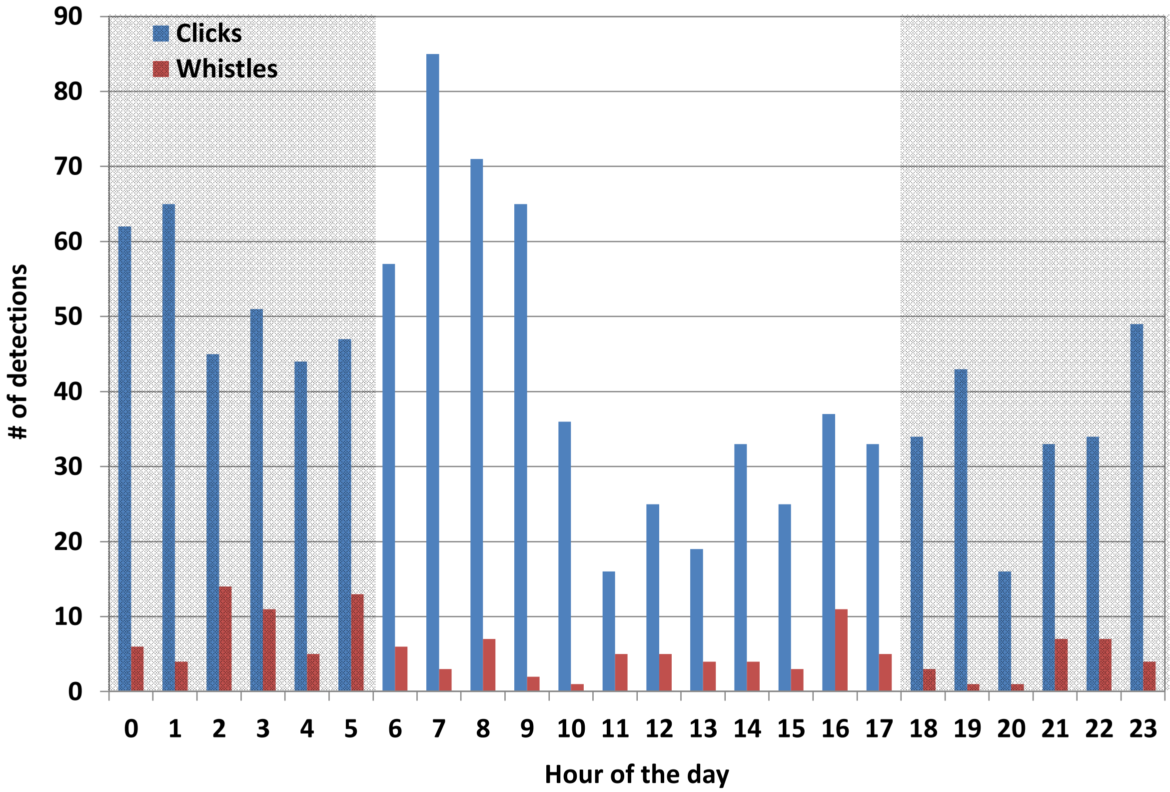


Figure 24. Detections of dolphin signals at site C2 (near Lung Kwu Chau) as a function of the hour of the day. Values are the total number of detections in each hour across the entire monitoring period.

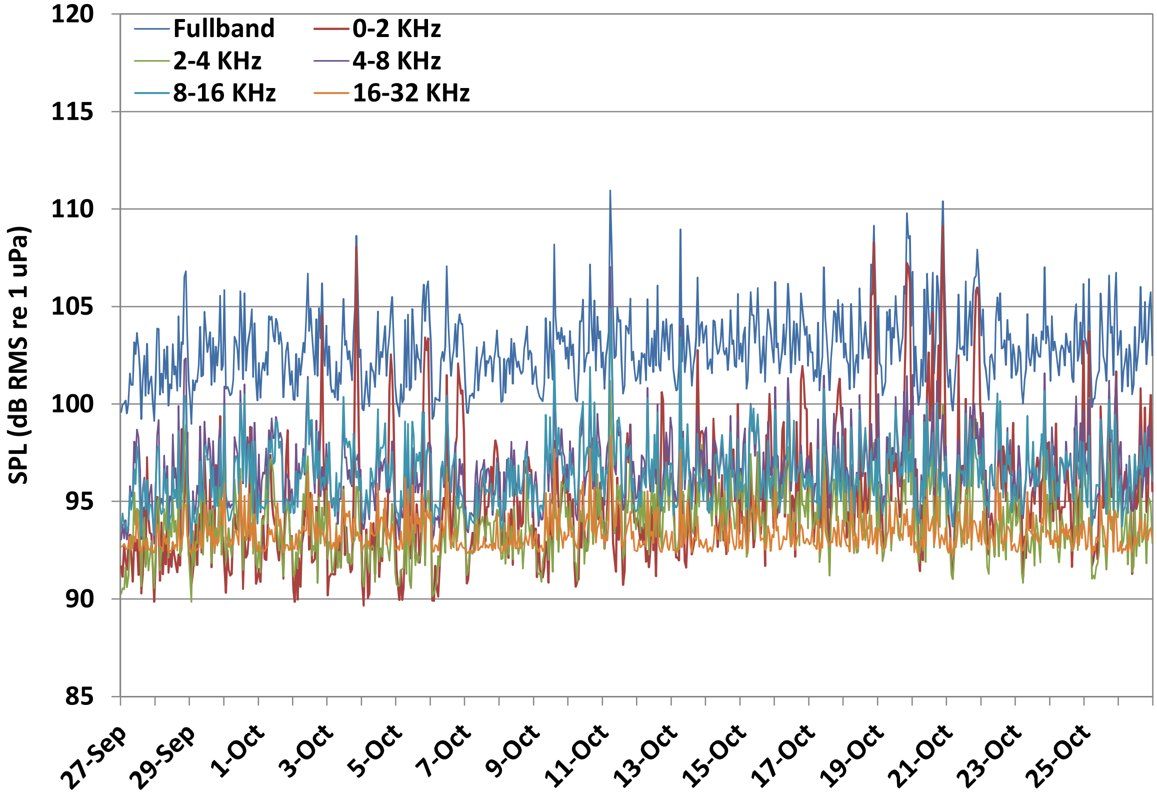


Figure 25. Root-mean-square (RMS) sound pressure level (SPL) in 1-octave bands and full bandwidth averaged hourly over the deployment period at site C2 (near Lung Kwu Chau).

Appendix I. Baseline Monitoring on Acoustic Monitoring in relation to TM-CLKL bored-piling works

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1-Sep	2-Sep	3-Sep	4-Sep	5-Sep	6-Sep	7-Sep
8-Sep	9-Sep	10-Sep	11-Sep	12-Sep	13-Sep	14-Sep
15-Sep	16-Sep	17-Sep	18-Sep	19-Sep	20-Sep	21-Sep
22-Sep	23-Sep	24-Sep	25-Sep	26-Sep	27-Sep	28-Sep
				Acoustic Monitoring Survey (Day 1)	Acoustic Monitoring Survey (Day 2)	Acoustic Monitoring Survey (Day 3)
29-Sep	30-Sep					
Acoustic Monitoring Survey (Day 4)	Acoustic Monitoring Survey (Day 5)					

Appendix I. (cont'd)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1-Oct	2-Oct	3-Oct	4-Oct	5-Oct
		Acoustic Monitoring Survey (Day 6)	Acoustic Monitoring Survey (Day 7)	Acoustic Monitoring Survey (Day 8)	Acoustic Monitoring Survey (Day 9)	Acoustic Monitoring Survey (Day 10)
6-Oct	7-Oct	8-Oct	9-Oct	10-Oct	11-Oct	12-Oct
Acoustic Monitoring Survey (Day 11)	Acoustic Monitoring Survey (Day 12)	Acoustic Monitoring Survey (Day 13)	Acoustic Monitoring Survey (Day 14)	Acoustic Monitoring Survey (Day 15)	Acoustic Monitoring Survey (Day 16)	Acoustic Monitoring Survey (Day 17)
13-Oct	14-Oct	15-Oct	16-Oct	17-Oct	18-Oct	19-Oct
Acoustic Monitoring Survey (Day 18)	Acoustic Monitoring Survey (Day 19)	Acoustic Monitoring Survey (Day 20)	Acoustic Monitoring Survey (Day 21)	Acoustic Monitoring Survey (Day 22)	Acoustic Monitoring Survey (Day 23)	Acoustic Monitoring Survey (Day 24)
20-Oct	21-Oct	22-Oct	23-Oct	24-Oct	25-Oct	26-Oct
Acoustic Monitoring Survey (Day 25)	Acoustic Monitoring Survey (Day 26)	Acoustic Monitoring Survey (Day 27)	Acoustic Monitoring Survey (Day 28)	Acoustic Monitoring Survey (Day 29)	Acoustic Monitoring Survey (Day 30)	
27-Oct	28-Oct	29-Oct	30-Oct	31-Oct		

Appendix II. Database of underwater sound recordings (including dolphin sound recordings) during baseline period of TM-CLKL acoustic monitoring

Date	File #	No. Cues	Begin Time	End Time	Duration	Begin LAT	Begin LONG	End LAT	End LONG	Area	Gain	Gain Change?	Water Depth	Hp Depth	BSS	Wind Speed	Prec.	Dolphin Record?	Note(s)
26-Sep-13	20	9	9:20:10	9:23:13	0:03:03	22.3048	113.9539	22.3048	113.9533	NE LANTAU	x10	N	6.4	5	2	2.1	0	N	near HKBCF
26-Sep-13	22	6	10:00:33	10:03:33	0:03:00	22.3077	113.9662	22.3065	113.9645	NE LANTAU	x10	N	3.9	3	2	0.3	0	N	near CMP and HKBCF; 2 minutes recordingy by Fostex recorder at same location
26-Sep-13	23	5	10:34:23	10:37:23	0:03:00	22.3035	113.9737	22.3030	113.9735	NE LANTAU	x20	N	3.9	3	2	2.5	0	N	weird sound @ 2:30
26-Sep-13	25	5	10:54:25	10:57:26	0:03:01	22.3138	113.9844	22.3133	113.9840	NE LANTAU	x20	N	9.9	5	2	2.1	0	N	
26-Sep-13	26	1	11:22:38	11:27:40	0:05:02	22.3262	113.9993	22.3253	113.9978	NE LANTAU	x10/x20	Y	14.7	5	3	2.5	0	N	gain change from 20dB to 10dB @ 1:26; snapping shrimp sound
26-Sep-13	27	4	11:52:00	11:55:00	0:03:00	22.3407	114.0115	22.3404	114.0102	NE LANTAU	x10	N	22.1	5	2	0.3	0	N	
26-Sep-13	28	6	12:24:10	12:27:12	0:03:02	22.3454	113.9940	22.3452	113.9929	NE LANTAU	x10	N	25.0	5	2	1.4	0	N	
26-Sep-13	29	5	12:51:40	12:54:50	0:03:10	22.3300	113.9762	22.3300	113.9756	NE LANTAU	x10	N	8.0	5	2	0.3	0	N	
26-Sep-13	30	10	13:23:20	13:26:40	0:03:20	22.3293	113.9710	22.3288	113.9705	NE LANTAU	x10	N	5.9	3	2	2.0	0	N	
26-Sep-13	32	15	13:55:30	14:00:45	0:05:15	22.3470	113.9600	22.3465	113.9588	NE LANTAU	x10	N	19.4	5	2	2.4	0	N	
26-Sep-13	33	1	16:26:35	16:30:20	0:03:45	22.2919	113.8784	22.2905	113.8780	NW LANTAU	x10/x20	Y	6.7	5	2	1.7	0	N	gain change from 20dB to 10dB @ 1:05; faint croaking sound
27-Sep-13	35	4	11:08:29	11:13:29	0:05:00	22.3772	113.8932	22.3744	113.8933	NW LANTAU	x10	N	10.3	5	3	2.2	0	Y	snapping shrimp sound
27-Sep-13	36	8	11:23:16	11:28:16	0:05:00	22.3849	113.8918	22.3831	113.8920	NW LANTAU	x10	N	21.5	5	2	3.3	0	Y	
27-Sep-13	37	7	11:28:18	11:33:20	0:05:02	22.3831	113.8920	22.3812	113.8925	NW LANTAU	x10	N	21.7	5	2	1.2	0	Y	
27-Sep-13	38	8	12:19:15	12:22:25	0:03:10	22.3326	113.9434	22.3328	113.9430	NW LANTAU	x10	N	11.2	5	2	1.8	0	N	
27-Sep-13	39	9	12:56:18	13:01:18	0:05:00	22.3342	113.9518	22.3343	113.9516	NE LANTAU	x10	N	7.4	5	3	0.8	0	Y	
27-Sep-13	40	5	13:10:05	13:13:05	0:03:00	22.3327	113.9441	22.3325	113.9437	NW LANTAU	x10	N	8.9	5	3	3.3	0	Y	
27-Sep-13	41	8	13:25:43	13:28:48	0:03:05	22.3327	113.9345	22.3332	113.9338	NW LANTAU	x10	N	7.8	5	3	0.6	0	N	
27-Sep-13	42	4	13:50:18	13:55:18	0:05:00	22.3362	113.9449	22.3364	113.9446	NW LANTAU	x10	N	16.9	5	2	1.6	0	Y	
27-Sep-13	43	8	13:55:25	14:00:25	0:05:00	22.3364	113.9446	22.3367	113.9445	NW LANTAU	x10	N	16.9	5	2	0.6	0	Y	
27-Sep-13	44	0	14:00:33	14:02:33	0:02:00	22.3367	113.9445	22.3367	113.9443	NW LANTAU	x10	N	27.8	5	2	0.6	0	Y	
27-Sep-13	45	0	14:04:01	14:09:00	0:04:59	22.3367	113.9442	22.3368	113.9440	NW LANTAU	x10	N	27.8	5	2	1.2	0	Y	
27-Sep-13	46	7	14:19:37	14:25:37	0:06:00	22.3375	113.9463	22.3375	113.9459	NW LANTAU	x10	N	8.3	5	2	1.2	0	Y	
27-Sep-13	47	6	14:26:51	14:29:51	0:03:00	22.3375	113.9459	22.3376	113.9456	NW LANTAU	x10	N	17.2	5	2	0.7	0	Y	
27-Sep-13	48	0	15:12:55	15:15:55	0:03:00	22.3321	113.9966	22.3319	113.9958	NE LANTAU	x10	N	9.2	5	2	3.7	0	N	
27-Sep-13	49	4	15:42:06	15:45:36	0:03:30	22.3363	114.0060	22.3366	114.0052	NE LANTAU	x10	N	14.1	5	2	2.5	0	N	
27-Sep-13	50	4	16:16:30	16:19:30	0:03:00	22.3286	113.9866	22.3286	113.9862	NE LANTAU	x10	N	10.4	5	2	1.3	0	N	near CMP
27-Sep-13	51	5	16:42:34	16:45:44	0:03:10	22.3119	113.9752	22.3124	113.9747	NE LANTAU	x10	N	5.9	3	2	2.6	0	N	
27-Sep-13	52	9	17:11:50	17:14:52	0:03:02	22.2998	113.9588	22.3002	113.9588	NE LANTAU	x10	N	3.8	3	2	1.1	0	N	
28-Sep-13	53	7	9:42:09	9:47:09	0:05:00	22.3111	113.9650	22.3107	113.9653	NE LANTAU	x10	N	4.3	3	2	1.8	0	N	near HKBCF
28-Sep-13	54	5	10:08:10	10:11:10	0:03:00	22.3045	113.9750	22.3038	113.9750	NE LANTAU	x10	N	4.0	3	2	3.6	0	N	snapping shrimp sound
28-Sep-13	56	3	10:40:49	10:43:48	0:02:59	22.3190	113.9906	22.3188	113.9906	NE LANTAU	x10	N	11.1	5	3	4.1	0	N	engine sound @ 1:04; weird sound @ 2:17 & 2:41
28-Sep-13	57	6	11:08:25	11:11:35	0:03:10	22.3331	114.0132	22.3323	114.0128	NE LANTAU	x10	N	17.3	5	3	4.3	0	N	
28-Sep-13	59	8	11:40:37	11:45:37	0:05:00	22.3528	114.0155	22.3522	114.0152	NE LANTAU	x10	N	15.8	5	3	4.0	0	N	
28-Sep-13	61	9	12:07:00	12:10:00	0:03:00	22.3541	114.0018	22.3542	114.0008	NE LANTAU	x10	N	10.6	5	2		0	N	
28-Sep-13	65	7	13:26:00	13:29:00	0:03:00	22.3511	113.9633	22.3510	113.9630	NE LANTAU	x20	N	12.2	5	3	2.9	0	N	
29-Sep-13	69	7	13:34:55	13:37:55	0:03:00	22.3280	113.9647	22.3279	113.9636	NE LANTAU	x0	N	11.1	5	3	3.8	0	N	near HKBCF
29-Sep-13	70	6	15:25:52	15:28:52	0:03:00	22.3482	114.0044	22.3477	114.0025	NE LANTAU	x10	N	17.7	5	2	1.4	0	N	starting recording at 2:20
29-Sep-13	72	7	16:01:43	16:04:43	0:03:00	22.3320	114.0018	22.3311	114.0000	NE LANTAU	x10	N	12.0	5	2	0.6	0.1-0.5	N	
30-Sep-13	73	5	9:39:47	9:42:49	0:03:02	22.3052	113.9709	22.3053	113.9708	NE LANTAU	x0/x10	Y	4.6	3	2	2.7	0	N	gain change from 0dB to 10dB @ 0:45; start recording at 1:10
30-Sep-13	74	8	10:11:45	10:14:43	0:02:58	22.3182	113.9789	22.3180	113.9791	NE LANTAU	x10	N	7.9	5	3	2.2	0	N	start recording at 2:45
30-Sep-13	75	8	10:39:00	10:43:03	0:04:03	22.3329	113.9988	22.3330	113.9989	NE LANTAU	x10	N	9.8	5	3	3.5	0	N	
30-Sep-13	77	2	11:28:13	11:32:23	0:04:10	22.3427	114.0001	22.3428	114.0003	NE LANTAU	x0/x10	Y	33.0	5	3	1.2	5.1	N	gain change from 0dB to 10dB @ 1:50; start recording at 1:50
30-Sep-13	80	1	12:39:17	12:42:18	0:03:01	22.3352	113.9680	22.3349	113.9683	NE LANTAU	x0	N	6.7	5	3	1.2	7	N	near Tai Mo To; start recording at 0:10
30-Sep-13	81	6	13:09:26	13:12:56	0:03:30	22.3498	113.9529	22.3492	113.9526	NE LANTAU	x0	N	14.4	5	2	3.2	0.1-0.5	N	start recording at 2:00
30-Sep-13	82	2	16:08:20	16:10:20	0:02:00	22.3047	113.9714	22.3047	113.9714	NE LANTAU	x0/x10/x20	Y	4.3	3	1	0.9	0	N	gain change from 0dB to 10dB @ 0:22; from 10dB to 20dB @ 0:44
30-Sep-13	84	6	16:13:09	16:16:11	0:03:02	22.3047	113.9713	22.3047	113.9708	NE LANTAU	x20	N	4.3	3	1	0.9	0	N	
30-Sep-13	85	6	16:22:37	16:26:36	0:03:59	22.3017	113.9665	22.3015	113.9658	NE LANTAU	x0/x10	Y	4.1	3	1	0.5	0	N	gain change from 0dB to 10dB @ 0:19
1-Oct-13	86	7	10:32:14	10:37:13	0:04:59	22.3766	113.8934	22.3749	113.8938	NW LANTAU	x10	N	31.0	5	3	1.8	0	Y	lots of cargo ships in shipping channel; snapping shrimp sound
1-Oct-13	87	5	10:37:26	10:42:31	0:05:05	22.3748	113.8938	22.3727	113.8941	NW LANTAU	x10	N	29.0	5	3	3.5	0	Y	lots of cargo ships in shipping channel; snapping shrimp sound
1-Oct-13	88	4	10:42:51	10:47:57	0:05:06	22.3726	113.8941	22.3702	113.8946	NW LANTAU	x10	N	29.0	5	3	1.6	0	Y	lots of cargo ships in shipping channel; snapping shrimp sound
1-Oct-13	89	3	10:49:18	10:54:18	0:05:00	22.3696	113.8946	22.3672	113.8946	NW LANTAU	x10	N	12.2	5	3	1.7	0	Y	snapping shrimp sound; 11:00 am - purse seine finish hauling net
1-Oct-13	90	3	11:24:43	11:29:42	0:04:59	22.3751	113.8908	22.3720	113.8909	NW LANTAU	x10	N	29.0	5	2	1.3	0	Y	snapping shrimp sound
1-Oct-13	92	1	11:44:50	11:49:50	0:05:00	22.3817	113.8879	22.3796	113.8882	NW LANTAU	x10	N	18.2	5	2	1.2	0	Y	snapping shrimp sound
1-Oct-13	93	6	13:09:40	13:12:40	0:03:00	22.3408	113.9535	22.3405	113.9544	NE LANTAU	x10	N	11.3	5	2	1.7	0	N	
1-Oct-13	94	3	13:39:39	13:42:39	0:03:00	22.3492	113.9664	22.3495	113.9673	NE LANTAU	x10	N	30.0	5	2	1.2	0	N	
1-Oct-13	95	3	14:01:22	14:05:21	0:03:59	22.3252	113.9765	22.3249	113.9773	NE LANTAU	x10	N	9.1	5	1	2.2	0	Y	
1-Oct-13	96	10	14:11:11	14:16:11	0:05:00	22.3274	113.9762	22.3275	113.9772	NE LANTAU	x10	N	10.2	5	2	1.2	0	Y	engine sound @ 2:45
1-Oct-13	97	7	14:16:15	14:20:16	0:04:01	22.3275	113.9772	22.3275	113.9777	NE LANTAU	x10	N	14.0	5	2	1.2	0	Y	

Appendix II. (cont'd)

Date	File #	No. Cues	Begin Time	End Time	Duration	Begin LAT	Begin LONG	End LAT	End LONG	Area	Gain	Gain Change?	Water Depth	Hp Depth	BSS	Wind Speed	Prec.	Dolphin Record?	Note(s)
1-Oct-13	98	11	14:25:41	14:31:41	0:06:00	22.3275	113.9777	22.3270	113.9765	NE LANTAU	x10	N	13.7	5	2	0.7	0	Y	
1-Oct-13	99	8	14:32:40	14:37:40	0:05:00	22.3270	113.9766	22.3267	113.9774	NE LANTAU	x10	N	14.9	5	2	1.4	0	Y	
1-Oct-13	100	9	14:47:24	14:52:24	0:05:00	22.3279	113.9767	22.3277	113.9772	NE LANTAU	x10	N	13.0	5	2	1.5	0	Y	
1-Oct-13	101	9	15:04:28	15:09:38	0:05:10	22.3244	113.9843	22.3240	113.9849	NE LANTAU	x10	N	10.5	5	2	2.1	0	Y	
1-Oct-13	102	5	15:20:48	15:24:48	0:04:00	22.3204	113.9925	22.3202	113.9927	NE LANTAU	x10	N	11.4	5	2	2.7	0	Y	
1-Oct-13	103	6	15:34:07	15:39:07	0:05:00	22.3176	113.9942	22.3168	113.9945	NE LANTAU	x10	N	7.0	5	2	2.5	0	Y	near Shum Shui Kok
1-Oct-13	104	8	16:12:50	16:15:50	0:03:00	22.3130	113.9658	22.3128	113.9657	NE LANTAU	x10	N	30.0	5	2	1.1	0	N	near HKBCF
1-Oct-13	105	8	16:21:28	16:24:28	0:03:00	22.3133	113.9653	22.3137	113.9649	NE LANTAU	x10	N	5.4	3	2	2.5	0	N	near HKBCF
2-Oct-13	106	7	9:28:08	9:31:08	0:03:00	22.3035	113.9656	22.3033	113.9658	NE LANTAU	x10	N	4.6	3	2	1.1	0	N	near HKBCF
2-Oct-13	108	3	10:01:20	10:04:20	0:03:00	22.3133	113.9813	22.3132	113.9816	NE LANTAU	x10	N	6.6	5	2	1.5	0	N	
2-Oct-13	109	5	10:27:11	10:30:11	0:03:00	22.3282	113.9989	22.3281	113.9995	NE LANTAU	x10	N	14.1	5	3	2.7	0	N	
2-Oct-13	110	2	10:59:56	11:02:56	0:03:00	22.3478	114.0016	22.3471	114.0031	NE LANTAU	x10	N	32.0	5	3	2.7	0	N	start recording at 1:00
2-Oct-13	111	9	11:30:50	11:33:50	0:03:00	22.3471	113.9872	22.3471	113.9882	NE LANTAU	x10	N	28.4	5	3	2.8	0	N	
2-Oct-13	112	3	11:57:58	12:00:58	0:03:00	22.3362	113.9768	22.3355	113.9776	NE LANTAU	x10	N	4.5	3	2	0.6	0	N	snapping shrimp sound
2-Oct-13	113	8	12:29:37	12:32:37	0:03:00	22.3269	113.9648	22.3268	113.9660	NE LANTAU	x10	N	11.8	5	2	1.4	0	N	
2-Oct-13	114	6	12:58:10	13:01:10	0:03:00	22.3409	113.9511	22.3398	113.9521	NW LANTAU	x10	N	11.2	5	2	1.2	0	N	
2-Oct-13	115	4	14:36:03	14:41:03	0:05:00	22.3848	113.8883	22.3825	113.8892	NW LANTAU	x10	N	18.8	5	2	1.4	0	Y	
2-Oct-13	116	5	14:51:32	14:56:32	0:05:00	22.3869	113.8925	22.3830	113.8935	NW LANTAU	x10	N	18.7	5	2	2.9	0	Y	
2-Oct-13	117	2	15:09:03	15:12:03	0:03:00	22.3808	113.9015	22.3791	113.9025	NW LANTAU	x10	N	20.0	5	3	3.7	0	Y	
2-Oct-13	118	7	15:40:11	15:44:11	0:04:00	22.3736	113.9135	22.3727	113.9143	NW LANTAU	x10/x0	Y	17.4	5	3	2.4	0	Y	near Power Plant and Lung Kwu Tan; gain change from 10dB to 0dB @ 2:00
3-Oct-13	119	2	12:33:10	12:36:15	0:03:05	22.3236	113.9906	22.3241	113.9921	NE LANTAU	x10	N	13.3	5	2	0.6	0	N	croaking sound heard
3-Oct-13	120	7	13:02:09	13:05:09	0:03:00	22.3107	113.9754	22.3108	113.9758	NE LANTAU	x10	N	4.9	3	1	0.6	0	N	
3-Oct-13	121	9	13:27:00	13:30:10	0:03:10	22.3097	113.9627	22.3097	113.9634	NE LANTAU	x20	N	4.1	3	2	2.5	0	N	
3-Oct-13	123	8	14:47:30	14:50:30	0:03:00	22.3396	113.9532	22.3396	113.9546	NE LANTAU	x10	N	9.6	5	3	2.8	0	N	
3-Oct-13	124	12	15:17:15	15:20:24	0:03:09	22.3498	113.9662	22.3503	113.9680	NE LANTAU	x10	N	13.3	5	2	3.7	0	N	
3-Oct-13	125	7	15:47:00	15:50:01	0:03:01	22.3402	113.9862	22.3407	113.9864	NE LANTAU	x20	N	8.8	5	2	1.5	0	N	
3-Oct-13	126	4	17:16:24	17:20:14	0:03:50	22.3341	113.9988	22.3343	113.9972	NE LANTAU	x20	N	9.2	5	2	2.8	0	N	croaking sound heard
3-Oct-13	127	4	17:51:09	17:54:09	0:03:00	22.3420	114.0003	22.3422	113.9993	NE LANTAU	x20	N	32.1	5	2	2.2	0	N	
3-Oct-13	128	13	18:16:40	18:20:10	0:03:30	22.3149	113.9674	22.3156	113.9664	NE LANTAU	x10/x20	Y	11.4	5	2	1.2	0	N	gain change from 20dB to 10dB @ 2:50
3-Oct-13	129	9	18:48:20	18:51:20	0:03:00	22.3044	113.9668	22.3044	113.9668	NE LANTAU	x10/x20	Y	4.1	3	2	2.1	0	N	gain change from 20dB to 10dB @ 2:12
3-Oct-13	130	6	19:45:30	19:48:30	0:03:00	22.3045	113.9668	22.3044	113.9668	NE LANTAU	x10/x20	Y	4.3	3	2	3.5	0	N	gain change from 10dB to 20dB @ 0:15; croaking sound heard
3-Oct-13	131	4	20:06:05	20:08:05	0:02:00	22.3039	113.9700	22.3040	113.9698	NE LANTAU	x20	N	4.3	3	2	3.0	0	N	at Pier B1 (0m); croaking sound heard
3-Oct-13	132	4	20:08:27	20:10:27	0:02:00	22.3040	113.9698	22.3042	113.9697	NE LANTAU	x20	N	4.8	3	2	3.1	0	N	at Pier B1 (10m); croaking sound heard
3-Oct-13	133	4	20:11:46	20:13:45	0:01:59	22.3044	113.9697	22.3047	113.9695	NE LANTAU	x20	N	4.8	3	2	3.9	0	N	at Pier B1 (20m); croaking sound heard
3-Oct-13	134	4	20:20:46	20:22:45	0:01:59	22.3039	113.9624	22.3041	113.9690	NE LANTAU	x20	N	4.8	3	2	4.2	0	N	at Pier B1 (50m); croaking sound heard
3-Oct-13	135	4	20:23:55	20:25:55	0:02:00	22.3042	113.9690	22.3046	113.9689	NE LANTAU	x20	N	4.8	3	2	4.4	0	N	at Pier B1 (100m); croaking sound heard
3-Oct-13	136	4	20:33:05	20:35:05	0:02:00	22.3040	113.9681	22.3045	113.9680	NE LANTAU	x20	N	4.9	3	2	5.8	0	N	at Pier B1 (200m); croaking sound heard
3-Oct-13	137	4	20:40:25	20:42:25	0:02:00	22.3038	113.9669	22.3042	113.9668	NE LANTAU	x20	N	4.8	3	2	4.7	0	N	at Pier B1 (300m); croaking sound heard
3-Oct-13	138	4	20:45:35	20:47:35	0:02:00	22.3039	113.9651	22.3042	113.9652	NE LANTAU	x20	N	4.8	3	2	3.6	0	N	at Pier B1 (500m); croaking sound heard
3-Oct-13	139	4	21:01:45	21:03:45	0:02:00	22.3037	113.9703	22.3040	113.9700	NE LANTAU	x20	N	4.8	3	2	4.6	0	N	at Pier B2 (0m); croaking sound heard
3-Oct-13	140	4	21:10:35	21:12:35	0:02:00	22.3032	113.9707	22.3035	113.9706	NE LANTAU	x20	N	4.7	3	2	4.5	0	N	at Pier B3 (0m)
3-Oct-13	141	4	21:18:30	21:20:30	0:02:00	22.3031	113.9707	22.3036	113.9708	NE LANTAU	x20	N	4.8	3	2	4.7	0	N	at Pier B3 (10m)
3-Oct-13	142	5	21:34:00	21:36:00	0:02:00	22.3033	113.9706	22.3040	113.9709	NE LANTAU	x20	N	4.9	3	2	4.3	0	N	at Pier B3 (20m); faint croaking sound
3-Oct-13	143	3	21:42:30	21:44:30	0:02:00	22.3031	113.9702	22.3035	113.9702	NE LANTAU	x20	N	4.8	3	2	4.5	0	N	at Pier B3 (50m); faint croaking sound
3-Oct-13	144	4	21:47:25	21:49:25	0:02:00	22.3031	113.9697	22.3034	113.9696	NE LANTAU	x20	N	4.8	3	2	4.1	0	N	at Pier B3 (100m); faint croaking sound
3-Oct-13	145	4	21:53:50	21:55:50	0:02:00	22.3031	113.9689	22.3034	113.9688	NE LANTAU	X20	N	4.8	3	2	4.8	0	N	at Pier B3 (200m)
3-Oct-13	146	4	22:00:22	22:02:20	0:01:58	22.3031	113.9678	22.3034	113.9676	NE LANTAU	x20	N	4.8	3	2	3.6	0	N	at Pier B3 (300m)
3-Oct-13	147	4	22:06:45	22:08:45	0:02:00	22.3032	113.9658	22.3034	113.9659	NE LANTAU	x20	N	5.2	3	2	3.8	0	N	at Pier B3 (500m)
4-Oct-13	148	19	9:50:05	9:55:05	0:05:00	22.2835	113.8826	22.2835	113.8820	NW LANTAU	x10	N	7.0	5	2	2.9	0	N	near HKLR09 bored pile sites; with 25-30 vessels within 500m
4-Oct-13	149	14	9:55:09	10:01:09	0:06:00	22.2835	113.8820	22.2832	113.8815	NW LANTAU	x10	N	7.0	5	2	2.9	0	N	near HKLR09 bored pile sites; with 25-30 vessels within 500m
4-Oct-13	150	6	10:05:14	10:10:44	0:05:30	22.2831	113.8813	22.2831	113.8811	NW LANTAU	x10	N	7.0	5	2	1.7	0	N	near HKLR09 bored pile sites; with 25-30 vessels within 500m
4-Oct-13	151	4	10:10:59	10:13:59	0:03:00	22.2831	113.8811	22.2830	113.8810	NW LANTAU	x10	N	7.0	5	2	2.4	0	N	near HKLR09 bored pile sites; with 25-30 vessels within 500m
4-Oct-13	152	3	11:43:09	11:47:09	0:04:00	22.3626	113.8728	22.3617	113.8725	NW LANTAU	x20	N	6.7	5	2	1.1	0	Y	faint croaking sound
4-Oct-13	153	7	12:41:42	12:44:42	0:03:00	22.3326	113.9433	22.3323	113.9440	NW LANTAU	x10	N	9.4	5	2	1.1	0	N	near HKBCF
4-Oct-13	154	23	13:12:57	13:17:58	0:05:01	22.3198	113.9691	22.3198	113.9691	NE LANTAU	x10	N	11.3	5	1	1.3	0	N	
4-Oct-13	155	8	14:13:42	14:17:27	0:03:45	22.3048	113.9703	22.3048	113.9703	NE LANTAU	x10	N	3.9	3	2	2.6	0	N	
4-Oct-13	156	5	14:42:46	14:45:46	0:03:00	22.3135	113.9795	22.3136	113.9799	NE LANTAU	x10	N	5.8	3	2	2.0	0	N	
4-Oct-13	157	0	15:13:10	15:16:10	0:03:00	22.3374	114.0001	22.3377	114.0006	NE LANTAU	x10	N	11.8	5	2	1.4	0	N	
4-Oct-13	158	2	15:41:30	15:44:30	0:03:00	22.3326	114.0134	22.3333	114.0133	NE LANTAU	x10	N	16.3	5	2	3.6	0	N	

Appendix II. (cont'd)

Date	File #	No. Cues	Begin Time	End Time	Duration	Begin LAT	Begin LONG	End LAT	End LONG	Area	Gain	Gain Change?	Water Depth	Hp Depth	BSS	Wind Speed	Prec.	Dolphin Record?	Note(s)
5-Oct-13	159	8	8:27:20	8:30:20	0:03:00	22.3010	113.9612	22.3008	113.9609	NE LANTAU	x20	N	4.3	3	2	1.6	0	N	
5-Oct-13	160	6	8:57:03	9:00:03	0:03:00	22.3104	113.9761	22.3104	113.9760	NE LANTAU	x20	N	5.7	3	2	1.3	0	N	
5-Oct-13	161	2	9:30:10	9:33:10	0:03:00	22.3313	113.9992	22.3310	113.9992	NE LANTAU	x20	N	11.8	5	2	1.7	0	N	
5-Oct-13	162	3	9:58:11	10:01:11	0:03:00	22.3462	114.0013	22.3460	114.0006	NE LANTAU	x10	N	31.5	5	2	1.9	0	N	
5-Oct-13	163	4	10:28:22	10:31:22	0:03:00	22.3294	113.9837	22.3282	113.9842	NE LANTAU	x20	N	11.7	5	2	1.3	0	N	
5-Oct-13	164	9	10:57:55	11:00:56	0:03:01	22.3446	113.9697	22.3435	113.9698	NE LANTAU	x10	N	26.9	5	2	1.3	0	N	
5-Oct-13	165	5	11:27:18	11:30:19	0:03:01	22.3503	113.9550	22.3500	113.9553	NE LANTAU	x10	N	14.7	5	2	2.4	0	N	
5-Oct-13	166	1	12:20:20	12:24:19	0:03:59	22.3521	113.8926	22.3503	113.8933	NW LANTAU	x10	N	9.8	5	2	3.4	0	Y	
5-Oct-13	167	2	12:38:01	12:42:01	0:04:00	22.3538	113.9002	22.3524	113.9014	NW LANTAU	x10	N	9.8	5	2	4.1	0	Y	
5-Oct-13	168	0	12:54:45	12:59:45	0:05:00	22.3595	113.9031	22.3577	113.9049	NW LANTAU	x10	N	12.0	5	3	3.0	0	Y	snapping shrimp sound
5-Oct-13	169	0	13:17:33	13:22:33	0:05:00	22.3667	113.8940	22.3645	113.8953	NW LANTAU	x10	N	11.7	5	2	3.4	0	Y	
5-Oct-13	170	1	13:41:53	13:45:49	0:03:56	22.3770	113.8907	22.3753	113.8919	NW LANTAU	x10	N	16.9	5	2	3.1	0	Y	
5-Oct-13	171	4	14:29:03	14:34:03	0:05:00	22.3653	113.8717	22.3631	113.8724	NW LANTAU	x10	N	6.2	5	2	3.0	0	Y	
6-Oct-13	172	2	11:09:28	11:14:28	0:05:00	22.3538	113.8913	22.3528	113.8916	NW LANTAU	x0	N	10.1	5	3	3.4	0	Y	
6-Oct-13	173	2	11:30:44	11:35:44	0:05:00	22.3548	113.8832	22.3544	113.8844	NW LANTAU	x0	N	8.0	5	4	5.1	0	Y	
6-Oct-13	174	5	12:06:29	12:11:29	0:05:00	22.3367	113.8973	22.3360	113.8990	NW LANTAU	x0	N	9.4	5	3	1.8	0	Y	
6-Oct-13	175	6	12:19:32	12:24:32	0:05:00	22.3379	113.8928	22.3366	113.8935	NW LANTAU	x0	N	9.7	5	3	2.1	0	Y	
6-Oct-13	177	1	12:35:06	12:40:06	0:05:00	22.3394	113.8879	22.3378	113.8895	NW LANTAU	x0	N	5.5	3	4	5.2	0	Y	
6-Oct-13	178	8	13:29:52	13:32:52	0:03:00	22.3341	113.9548	22.3338	113.9563	NE LANTAU	x10	N	7.0	5	3	1.6	0	N	
6-Oct-13	179	5	13:57:32	14:00:32	0:03:00	22.3419	113.9753	22.3416	113.9765	NE LANTAU	x10	N	14.7	5	2	1.8	0	N	
6-Oct-13	180	7	14:27:05	14:30:05	0:03:00	22.3467	113.9922	22.3463	113.9938	NE LANTAU	x10	N	31.0	5	3	2.7	0	N	
6-Oct-13	181	2	14:59:25	15:02:25	0:03:00	22.3398	114.0112	22.3395	114.0136	NE LANTAU	x10	N	20.1	5	3	3.0	0	N	
6-Oct-13	182	5	15:28:20	15:31:20	0:03:00	22.3229	113.9982	22.3232	113.9999	NE LANTAU	x10	N	7.9	5	4	3.5	0	N	
6-Oct-13	183	7	15:57:57	16:00:57	0:03:00	22.3102	113.9803	22.3101	113.9812	NE LANTAU	x10	N	5.5	3	4	5.0	0	N	
6-Oct-13	184	7	16:16:26	16:19:26	0:03:00	22.3086	113.9716	22.3084	113.9724	NE LANTAU	x10	N	4.3	3	4	4.5	0	N	
6-Oct-13	185	10	16:46:02	16:49:02	0:03:00	22.3048	113.9528	22.3041	113.9531	NE LANTAU	x10	N	5.6	3	3	4.8	0	N	
7-Oct-13	186	7	9:32:10	9:35:10	0:03:00	22.3081	113.9688	22.3076	113.9690	NE LANTAU	x20	N	4.8	3	3	5.0	0	N	
7-Oct-13	187	3	10:02:03	10:05:03	0:03:00	22.3238	113.9828	22.3232	113.9828	NE LANTAU	x20	N	11.3	5	3	5.8	0	N	
7-Oct-13	188	1	10:31:35	10:34:35	0:03:00	22.3318	114.0061	22.3311	114.0062	NE LANTAU	x20	N	16.0	5	4	5.6	0	N	
7-Oct-13	189	2	11:02:35	11:05:35	0:03:00	22.3353	113.9952	22.3344	113.9952	NE LANTAU	x20	N	9.1	5	4	5.9	0	N	
7-Oct-13	190	4	11:33:30	11:36:30	0:03:00	22.3249	113.9792	22.3244	113.9800	NE LANTAU	x20	N	12.8	5	4	7.1	0	N	
7-Oct-13	191	3	11:45:22	11:48:28	0:03:06	22.3318	113.9764	22.3312	113.9772	NE LANTAU	x10	N	8.6	5	5	7.7	0	N	
7-Oct-13	192	6	12:23:30	12:28:30	0:05:00	22.3436	113.9789	22.3434	113.9805	NE LANTAU	x10	N	30.1	5	3	3.8	0	Y	
7-Oct-13	193	6	13:01:30	13:06:30	0:05:00	22.3454	113.9765	22.3449	113.9887	NE LANTAU	x10	N	33.6	5	5	4.8	0	Y	
7-Oct-13	194	4	13:07:40	13:12:40	0:05:00	22.3449	113.9787	22.3451	113.9813	NE LANTAU	x10	N	31.8	5	4	4.9	0	Y	
7-Oct-13	195	0	13:51:48	13:54:48	0:03:00	22.3429	113.9598	22.3425	113.9623	NE LANTAU	x10	N	16.1	5	5	6.3	0	N	
7-Oct-13	196	5	14:22:15	14:25:15	0:03:00	22.3499	113.9543	22.3494	113.9572	NE LANTAU	x10	N	14.8	5	5	5.9	0	N	
7-Oct-13	197	8	14:46:10	14:51:10	0:05:00	22.3397	113.9477	22.3385	113.9508	NE LANTAU	x10	N	9.8	5	3	5.5	0	Y	
7-Oct-13	198	4	15:15:55	15:19:55	0:04:00	22.3427	113.9367	22.3406	113.9392	NE LANTAU	x10	N	9.8	5	4	3.5	0	Y	
8-Oct-13	199	2	12:24:51	12:27:51	0:03:00	22.3021	113.9713	22.3021	113.9714	NE LANTAU	x0/x10	Y	4.8	3	3	4.6	0	N	at Pier B5 (0m); gain change from 0dB to 10dB @ 0:10
8-Oct-13	200	4	12:34:25	12:37:25	0:03:00	22.3023	113.9712	22.3022	113.9712	NE LANTAU	x10	N	4.8	3	3	4.6	0	N	at Pier B5 (10m)
8-Oct-13	201	3	12:43:39	12:46:39	0:03:00	22.3022	113.9710	22.3020	113.9710	NE LANTAU	x10	N	4.8	3	3	5.0	0	N	at Pier B5 (20m)
8-Oct-13	202	4	12:54:20	12:57:20	0:03:00	22.3020	113.9703	22.3020	113.9703	NE LANTAU	x10	N	4.7	3	3	2.0	0	N	at Pier B5 (100m)
8-Oct-13	203	6	13:10:05	13:13:05	0:03:00	22.3022	113.9708	22.3022	113.9707	NE LANTAU	x10	N	4.8	3	4	3.4	0	N	at Pier B5 (50m)
8-Oct-13	204	6	13:19:15	13:22:15	0:03:00	22.3021	113.9694	22.3020	113.9694	NE LANTAU	x10	N	4.8	3	3	3.5	0	N	at Pier B5 (200m)
8-Oct-13	205	4	13:28:49	13:31:48	0:02:59	22.3021	113.9684	22.3020	113.9685	NE LANTAU	x10	N	4.6	3	3	3.9	0	N	at Pier B5 (300m)
8-Oct-13	206	4	13:42:28	13:45:28	0:03:00	22.3022	113.9664	22.3021	113.9664	NE LANTAU	x10	N	4.6	3	3	5.1	0	N	at Pier B5 (500m)
8-Oct-13	207	4	13:59:50	14:02:50	0:03:00	22.3012	113.9712	22.3012	113.9713	NE LANTAU	x10	N	5.0	3	3	3.0	0	N	at Pier B7 (20m)
8-Oct-13	208	5	14:03:18	14:06:18	0:03:00	22.3011	113.9713	22.3011	113.9713	NE LANTAU	x10	N	4.8	3	3	3.8	0	N	at Pier B7 (10m)
8-Oct-13	209	4	14:27:40	14:30:40	0:03:00	22.3010	113.9713	22.3009	113.9713	NE LANTAU	x10	N	4.5	3	3	3.9	0	N	at Pier B7 (0m); very close to shore
8-Oct-13	210	5	14:39:50	14:42:55	0:03:05	22.3010	113.9709	22.3009	113.9709	NE LANTAU	x10	N	4.8	3	2	3.7	0	N	at Pier B7 (50m)
8-Oct-13	211	8	14:48:40	14:51:40	0:03:00	22.3010	113.9703	22.3009	113.9702	NE LANTAU	x10	N	5.0	3	2	2.7	0	N	at Pier B7 (100m)
8-Oct-13	213	4	15:03:10	15:06:11	0:03:01	22.3010	113.9695	22.3009	113.9694	NE LANTAU	x10	N	4.8	3	3	2.7	0	N	at Pier B7 (200m)
8-Oct-13	214	4	15:15:10	15:18:10	0:03:00	22.3009	113.9685	22.3009	113.9685	NE LANTAU	x20	N	5.0	3	3	3.4	0	N	at Pier B7 (300m)
8-Oct-13	215	6	15:23:35	15:26:35	0:03:00	22.3010	113.9666	22.3010	113.9666	NE LANTAU	x20	N	4.9	3	3	3.3	0	N	at Pier B7 (500m)
8-Oct-13	216	4	16:02:40	16:05:40	0:03:00	22.3241	113.9892	22.3234	113.9907	NE LANTAU	x10	N	12.4	5	2	3.2	0	N	
8-Oct-13	217	1	16:33:34	16:36:34	0:03:00	22.3329	114.0133	22.3333	114.0139	NE LANTAU	x10	N	16.5	5	3	2.4	0	N	
8-Oct-13	218	6	16:59:26	17:04:26	0:05:00	22.3524	114.0070	22.3519	114.0080	NE LANTAU	x0	N	10.5	5	2	2.1	0	Y	
8-Oct-13	219	13	17:09:36	17:14:36	0:05:00	22.3511	114.0024	22.3504	114.0041	NE LANTAU	x0	N	11.1	5	2	3.1	0	Y	

Appendix II. (cont'd)

Date	File #	No. Cues	Begin Time	End Time	Duration	Begin LAT	Begin LONG	End LAT	End LONG	Area	Gain	Gain Change?	Water Depth	Hp Depth	BSS	Wind Speed	Prec.	Dolphin Record?	Note(s)
8-Oct-13	220	7	17:21:10	17:25:10	0:04:00	22.3482	113.9975	22.3477	113.9984	NE LANTAU	x0	N	32.0	5	2	1.5	0	Y	
8-Oct-13	221	0	18:01:25	18:04:25	0:03:00	22.3369	113.9863	22.3366	113.9853	NE LANTAU	x10	N	4.6	3	2	3.6	0	N	
8-Oct-13	222	5	20:08:45	20:11:45	0:03:00	22.3017	113.9694	22.3018	113.9695	NE LANTAU	x0/x10	Y	4.8	3	2	1.8	0	N	gain change from 0 dB to 10dB @ 0:15
8-Oct-13	223	3	20:48:10	20:51:10	0:03:00	22.3018	113.9694	22.3018	113.9694	NE LANTAU	x20	N	5.0	3	2	1.3	0	N	croaking sound heard
8-Oct-13	224	5	21:16:31	21:19:31	0:03:00	22.3017	113.9694	22.3017	113.9694	NE LANTAU	x10	N	5.2	3	2	1.8	0	N	croaking sound heard
8-Oct-13	225	2	21:44:08	21:47:08	0:03:00	22.3017	113.9695	22.3017	113.9694	NE LANTAU	x10	N	5.3	3	2	1.8	0	N	croaking sound heard
8-Oct-13	226	2	22:18:00	22:21:00	0:03:00	22.3017	113.9695	22.3017	113.9695	NE LANTAU	x20	N	5.4	3	2	1.0	0	N	
8-Oct-13	227	2	22:49:37	22:52:37	0:03:00	22.3017	113.9695	22.3018	113.9694	NE LANTAU	x20/x10	Y	5.5	3	2	0.4	0	N	gain change from 20dB to 10dB @ 0:22
8-Oct-13	228	2	23:17:05	23:20:04	0:02:59	22.3017	113.9696	22.3017	113.9695	NE LANTAU	x10	N	5.5	3	2	2.4	0	N	
9-Oct-13	229	2	0:16:35	0:19:35	0:03:00	22.3017	113.9698	22.3017	113.9698	NE LANTAU	x10	N	5.5	3	1	2.9	0	N	
9-Oct-13	231	2	1:19:55	1:21:55	0:02:00	22.3018	113.9693	22.3018	113.9693	NE LANTAU	x10	N	5.3	3	2	2.6	0	N	
9-Oct-13	232	2	2:15:55	2:18:55	0:03:00	22.3023	113.9698	22.3023	113.9698	NE LANTAU	x10	N	4.8	3	1	1.1	0	N	
9-Oct-13	233	2	3:17:33	3:20:33	0:03:00	22.3022	113.9700	22.3021	113.9701	NE LANTAU	x10	N	4.3	3	2	1.1	0	N	
9-Oct-13	234	2	4:18:50	4:21:50	0:03:00	22.3021	113.9701	22.3022	113.9701	NE LANTAU	x10	N	4.5	3	1	1.9	0	N	
9-Oct-13	235	2	5:52:43	5:55:44	0:03:01	22.3022	113.9700	22.3021	113.9701	NE LANTAU	x10	N	3.5	3	2	2.7	0	N	
9-Oct-13	236	3	6:18:23	6:21:23	0:03:00	22.3021	113.9701	22.3020	113.9701	NE LANTAU	x10	N	3.3	3	2	0.8	0	N	
9-Oct-13	237	5	6:48:23	6:51:23	0:03:00	22.3022	113.9700	22.3022	113.9700	NE LANTAU	x10	N	3.4	3	2	1.4	0	N	
9-Oct-13	238	9	7:32:30	7:35:30	0:03:00	22.3234	113.9692	22.3234	113.9693	NE LANTAU	x0	N	10.3	5	1	0.6	0	N	
9-Oct-13	239	3	8:03:20	8:06:20	0:03:00	22.3395	113.9553	22.3391	113.9552	NE LANTAU	x0	N	10.3	5	1	1.0	0	N	
9-Oct-13	240	8	8:21:50	8:24:50	0:03:00	22.3282	113.9694	22.3281	113.9682	NE LANTAU	x0	N	7.7	5	1	0.3	0	N	
9-Oct-13	241	4	8:41:59	8:44:59	0:03:00	22.3495	113.9634	22.3496	113.9626	NE LANTAU	x0	N	14.4	5	2	0.7	0	N	
9-Oct-13	242	8	9:02:18	9:05:18	0:03:00	22.3346	113.9755	22.3352	113.9751	NE LANTAU	x0	N	5.5	3	2	1.7	0	N	
9-Oct-13	243	4	9:33:10	9:38:10	0:05:00	22.3466	113.9897	22.3464	113.9886	NE LANTAU	x0	N	31.1	5	2	2.0	0	Y	
9-Oct-13	244	3	9:49:35	9:54:35	0:05:00	22.3477	113.9967	22.3474	113.9955	NE LANTAU	x0	N	33.7	5	2	1.1	0	Y	
9-Oct-13	245	2	10:09:50	10:14:50	0:05:00	22.3430	114.0015	22.3428	114.0023	NE LANTAU	x0	N	30.3	5	2	1.3	0	Y	
9-Oct-13	246	0	10:47:20	10:50:21	0:03:01	22.3330	114.0059	22.3327	114.0054	NE LANTAU	x0	N	15.1	5	2	0.8	0	N	
9-Oct-13	247	0	11:11:10	11:16:10	0:05:00	22.3332	113.9973	22.3328	113.9965	NE LANTAU	x0	N	9.1	5	2	1.4	0	Y	
9-Oct-13	248	9	11:43:44	11:46:44	0:03:00	22.3152	113.9721	22.3152	113.9712	NE LANTAU	x10	N	13.1	5	3	4.1	0	N	
10-Oct-13	249	1	10:01:49	10:06:49	0:05:00	22.3267	113.8798	22.3272	113.8781	NW LANTAU	x10	N	6.6	5	3	3.0	0	Y	
10-Oct-13	250	11	10:16:15	10:21:15	0:05:00	22.3282	113.8838	22.3286	113.8824	NW LANTAU	x10	N	6.5	5	2	2.8	0	Y	
10-Oct-13	251	1	10:28:50	10:33:50	0:05:00	22.3370	113.8818	22.3380	113.8802	NW LANTAU	x10	N	4.8	3	2	3.3	0	Y	
10-Oct-13	253	0	10:46:10	10:51:10	0:05:00	22.3421	113.8799	22.3432	113.8791	NW LANTAU	x10	N	5.8	5	2	1.8	0	Y	
10-Oct-13	254	2	10:53:32	10:58:37	0:05:05	22.3435	113.8787	22.3441	113.8781	NW LANTAU	x10	N	6.8	5	2	2.4	0	Y	
10-Oct-13	255	3	11:04:04	11:09:04	0:05:00	22.3452	113.8787	22.3458	113.8781	NW LANTAU	x10	N	7.0	5	2	2.9	0	Y	
10-Oct-13	256	2	12:23:40	12:27:40	0:04:00	22.3563	113.9109	22.3571	113.9035	NW LANTAU	x10/x0	Y	13.3	5	3	3.0	0	Y	gain change from 10dB to 0dB @ 2:05
10-Oct-13	257	6	13:02:28	13:07:28	0:05:00	22.3489	113.9530	22.3492	113.9522	NE LANTAU	x0	N	5.0	3	2	1.7	0	N	
10-Oct-13	258	4	13:35:34	13:40:34	0:05:00	22.3375	113.9591	22.3381	113.9591	NE LANTAU	x0	N	9.5	5	2	1.6	0	Y	
10-Oct-13	259	7	13:48:10	13:53:10	0:05:00	22.3370	113.9529	22.3380	113.9527	NE LANTAU	x0	N	8.4	5	2	0.3	0	Y	near HKBCF; sound of mud pit dredger
10-Oct-13	262	1	14:31:59	14:34:59	0:03:00	22.3351	113.9763	22.3347	113.9766	NE LANTAU	x0	N	5.9	5	1	1.6	0	N	
10-Oct-13	263	2	15:03:35	15:06:35	0:03:00	22.3388	113.9919	22.3389	113.9926	NE LANTAU	x0	N	10.4	5	2	2.8	0	N	
10-Oct-13	264	5	15:32:29	15:35:29	0:03:00	22.3467	114.0096	22.3462	114.0106	NE LANTAU	x10/x0	Y	24.7	5	2	3.0	0	N	gain change from 10dB to 0dB @ 1:45
10-Oct-13	265	6	16:16:35	16:19:35	0:03:00	22.3340	113.9986	22.3339	113.9994	NE LANTAU	x10	N	9.5	5	2	1.6	0	N	croaking sound heard
11-Oct-13	266	6	9:47:53	9:50:53	0:03:00	22.3057	113.9730	22.3052	113.9728	NE LANTAU	x10	N	3.3	3	1	0.6	0	N	
11-Oct-13	267	7	10:17:13	10:20:23	0:03:10	22.3212	113.9810	22.3212	113.9811	NE LANTAU	x20	N	11.1	5	1	0.0	0	N	
11-Oct-13	269	5	10:48:59	10:51:59	0:03:00	22.3367	114.0060	22.3363	114.0051	NE LANTAU	x10	N	13.4	5	1	1.1	0	N	
11-Oct-13	270	8	11:20:44	11:23:45	0:03:01	22.3444	114.0012	22.3441	114.0009	NE LANTAU	x10	N	33.0	5	2	2.1	0	N	
11-Oct-13	271	6	11:47:23	11:50:23	0:03:00	22.3446	113.9862	22.3441	113.9855	NE LANTAU	x10	N	29.3	5	2	1.5	0	N	
11-Oct-13	272	6	12:18:04	12:20:04	0:02:00	22.3508	113.9762	22.3508	113.9755	NE LANTAU	x10	N	13.2	5	2	2.1	0	N	
11-Oct-13	273	9	12:45:25	12:50:55	0:05:30	22.3437	113.9765	22.3436	113.9760	NE LANTAU	x10	N	30.4	5	2	0.4	0	Y	
11-Oct-13	274	9	13:00:00	13:05:00	0:05:00	22.3443	113.9725	22.3442	113.9715	NE LANTAU	x10	N	28.8	5	2	1.3	0	Y	
11-Oct-13	275	7	13:15:37	13:20:37	0:05:00	22.3449	113.9757	22.3452	113.9755	NE LANTAU	x10	N	32.0	5	2	2.3	0	Y	
11-Oct-13	276	1	13:26:32	13:30:32	0:04:00	22.3450	113.9786	22.3456	113.9787	NE LANTAU	x10	N	31.5	5	2	3.1	0	Y	
11-Oct-13	277	7	14:18:22	14:21:22	0:03:00	22.3354	113.9438	22.3355	113.9440	NE LANTAU	x10	N	8.7	5	2	2.7	0	N	
11-Oct-13	278	2	15:00:32	15:02:32	0:02:00	22.3039	113.9699	22.3039	113.9701	NE LANTAU	x10/x20	Y	4.3	3	2	0.8	0	N	gain change from 10dB to 20dB @ 0:25; at Pier B1 (0m)
11-Oct-13	279	4	15:12:48	15:14:48	0:02:00	22.3039	113.9697	22.3038	113.9699	NE LANTAU	x20	N	4.3	3	2	2.5	0	N	at Pier B1 (20m)
11-Oct-13	280	2	15:29:02	15:31:02	0:02:00	22.3038	113.9697	22.3037	113.9698	NE LANTAU	x20	N	4.4	3	2	1.2	0	N	at Pier B1 (10m)
11-Oct-13	281	3	15:38:24	15:40:24	0:02:00	22.3039	113.9694	22.3040	113.9696	NE LANTAU	x20	N	4.3	3	2	2.4	0	N	at Pier B1 (50m)
11-Oct-13	282	5	15:43:42	15:45:42	0:02:00	22.3039	113.9689	22.3039	113.9690	NE LANTAU	x20	N	4.3	3	2	0.3	0	N	at Pier B1 (100m)
11-Oct-13	283	4	15:49:58	15:51:58	0:02:00	22.3039	113.9680	22.3039	113.9682	NE LANTAU	x20	N	4.4	3	2	2.3	0	N	at Pier B1 (200m)

Appendix II. (cont'd)

Date	File #	No. Cues	Begin Time	End Time	Duration	Begin LAT	Begin LONG	End LAT	End LONG	Area	Gain	Gain Change?	Water Depth	Hp Depth	BSS	Wind Speed	Prec.	Dolphin Record?	Note(s)
11-Oct-13	284	5	15:55:28	15:57:28	0:02:00	22.3039	113.9670	22.3039	113.9672	NE LANTAU	x20	N	4.3	3	2	2.5	0	N	at Pier B1 (300m)
11-Oct-13	285	3	16:01:34	16:03:34	0:02:00	22.3039	113.9650	22.3039	113.9651	NE LANTAU	x20	N	4.3	3	2	1.0	0	N	at Pier B1 (500m)
11-Oct-13	286	3	16:12:54	16:14:54	0:02:00	22.3032	113.9707	22.3031	113.9708	NE LANTAU	x20	N	4.3	3	2	1.2	0	N	at Pier B3 (0m)
11-Oct-13	287	5	16:18:02	16:20:03	0:02:01	22.3031	113.9705	22.3031	113.9705	NE LANTAU	x20	N	4.3	3	2	0.5	0	N	at Pier B3 (20m)
11-Oct-13	288	6	16:20:50	16:22:50	0:02:00	22.3031	113.9706	22.3031	113.9707	NE LANTAU	x20	N	4.3	3	2	0.6	0	N	at Pier B3 (10m)
11-Oct-13	289	3	16:26:29	16:28:29	0:02:00	22.3033	113.9702	22.3033	113.9702	NE LANTAU	x20	N	4.4	3	2	1.7	0	N	at Pier B3 (50m)
11-Oct-13	290	3	16:32:43	16:34:43	0:02:00	22.3032	113.9696	22.3032	113.9697	NE LANTAU	x20	N	4.3	3	2	1.0	0	N	at Pier B3 (100m)
11-Oct-13	291	4	16:39:08	16:41:08	0:02:00	22.3032	113.9688	22.3032	113.9690	NE LANTAU	x20	N	4.3	3	2	1.6	0	N	at Pier B3 (200m)
11-Oct-13	292	3	16:44:51	16:46:51	0:02:00	22.3032	113.9677	22.3031	113.9678	NE LANTAU	x20	N	4.3	3	2	1.2	0	N	at Pier B3 (300m)
11-Oct-13	293	5	16:50:30	16:52:30	0:02:00	22.3032	113.9658	22.3033	113.9659	NE LANTAU	x20	N	4.3	3	2	1.7	0	N	at Pier B3 (500m)
12-Oct-13	294	10	10:45:23	10:50:24	0:05:01	22.3785	113.9046	22.3770	113.9047	NW LANTAU	x0	N	19.8	5	2	4.5	0	Y	
12-Oct-13	295	6	11:04:50	11:10:05	0:05:15	22.3724	113.9125	22.3721	113.9132	NW LANTAU	x0	N	20.7	5	2	1.8	0	Y	
12-Oct-13	296	9	11:22:16	11:27:17	0:05:01	22.3739	113.9131	22.3734	113.9137	NW LANTAU	x0	N	17.6	5	2	1.3	0	Y	Near Power Plant ; a fuel tanker (~160m away) stopped next to power plant
12-Oct-13	297	4	12:34:44	12:37:59	0:03:15	22.3332	113.9432	22.3333	113.9427	NW LANTAU	x0/x10	Y	7.7	5	2	2.9	0	N	
12-Oct-13	298	9	13:07:02	13:11:04	0:04:02	22.3501	113.9514	22.3509	113.9500	NE LANTAU	x10	N	14.3	5	3	5.4	0	N	
12-Oct-13	299	2	13:37:00	13:40:00	0:03:00	22.3374	113.9678	22.3379	113.9669	NE LANTAU	x20	N	10.7	5	3	4.1	0	N	
12-Oct-13	300	6	14:07:05	14:10:05	0:03:00	22.3230	113.9793	22.3235	113.9785	NE LANTAU	x20	N	11.0	5	2	3.5	0	N	
12-Oct-13	301	0	14:36:55	14:39:55	0:03:00	22.3395	113.9913	22.3399	113.9901	NE LANTAU	x20	N	11.9	5	2	2.3	0	N	
12-Oct-13	302	3	15:06:33	15:09:33	0:03:00	22.3326	114.0135	22.3330	114.0129	NE LANTAU	x20	N	16.7	5	2	2.5	0	N	
12-Oct-13	303	2	15:27:06	15:30:06	0:03:00	22.3258	113.9996	22.3262	113.9986	NE LANTAU	x20	N	13.8	5	2	2.1	0	N	
12-Oct-13	304	4	15:59:45	16:04:45	0:05:00	22.3294	113.9777	22.3301	113.9762	NE LANTAU	x10	N	9.6	5	3	2.4	0	Y	
12-Oct-13	305	1	16:05:19	16:10:18	0:04:59	22.3302	113.9760	22.3310	113.9746	NE LANTAU	x10	N	6.8	5	3	3.2	0	Y	
13-Oct-13	306	6	10:25:25	10:28:30	0:03:05	22.3103	113.9754	22.3098	113.9751	NE LANTAU	x10	N	4.5	3	2	2.9	0	N	
13-Oct-13	307	8	11:49:23	11:52:23	0:03:00	22.3360	113.9471	22.3357	113.9470	NE LANTAU	x10	N	7.5	5	3	2.4	0	N	
13-Oct-13	308	6	12:17:05	12:20:05	0:03:00	22.3293	113.9604	22.3293	113.9598	NE LANTAU	x10	N	7.7	5	2	1.5	0	N	
13-Oct-13	309	4	12:48:55	12:51:55	0:03:00	22.3394	113.9759	22.3394	113.9753	NE LANTAU	x10	N	7.3	5	3	3.3	0	N	
13-Oct-13	310	7	13:17:40	13:20:40	0:03:00	22.3492	113.9914	22.3491	113.9905	NE LANTAU	x10	N	20.3	5	2	0.7	0	N	
13-Oct-13	311	7	13:43:40	13:46:40	0:03:00	22.3460	113.9952	22.3428	113.9946	NE LANTAU	x10	N	32.9	5	2	1.4	0	Y	
13-Oct-13	312	5	14:16:57	14:19:57	0:03:00	22.3306	114.0114	22.3297	114.0109	NE LANTAU	x10	N	15.4	5	1	0.9	0	N	
13-Oct-13	313	4	14:47:14	14:50:14	0:03:00	22.3264	113.9838	22.3260	113.9823	NE LANTAU	x10	N	10.3	5	2	0.4	0	N	
13-Oct-13	314	4	15:18:50	15:21:50	0:03:00	22.3029	113.9651	22.3026	113.9646	NE LANTAU	x20	N	4.0	3	1	0.6	0	N	
13-Oct-13	315	5	15:49:40	15:52:40	0:03:00	22.3247	113.9698	22.3245	113.9692	NE LANTAU	x10	N	11.7	5	1	0.9	0	N	
13-Oct-13	316	4	16:20:05	16:23:07	0:03:02	22.3333	113.9768	22.3332	113.9762	NE LANTAU	x10	N	8.0	5	2	0.7	0	N	
14-Oct-13	318	2	9:53:53	9:56:53	0:03:00	22.3395	113.9948	22.3393	113.9947	NE LANTAU	x20	N	13.0	5	3	6.0	0	N	
14-Oct-13	319	1	10:22:55	10:25:55	0:03:00	22.3308	113.9854	22.3308	113.9861	NE LANTAU	x20	N	9.8	5	3	4.9	0	N	
14-Oct-13	320	5	10:59:53	11:02:53	0:03:00	22.3521	113.9753	22.3524	113.9761	NE LANTAU	x20	N	11.3	5	2	4.0	0	N	
14-Oct-13	321	6	11:27:15	11:30:15	0:03:00	22.3277	113.9618	22.3271	113.9620	NE LANTAU	x0	N	9.9	5	3	5.0	0	N	
14-Oct-13	322	6	11:58:37	12:01:37	0:03:00	22.3404	113.9466	22.3401	113.9468	NE LANTAU	x10	N	18.3	5	2	3.0	0	N	
14-Oct-13	323	1	13:14:28	13:19:28	0:05:00	22.3775	113.8749	22.3763	113.8742	NW LANTAU	x10	N	10.0	5	2	1.1	0	Y	
14-Oct-13	324	0	13:21:07	13:25:07	0:04:00	22.3759	113.8740	22.3748	113.8737	NW LANTAU	x10/x20	Y	10.0	5	1	0.9	0	Y	
14-Oct-13	325	3	13:46:14	13:51:16	0:05:02	22.3744	113.8876	22.3726	113.8869	NW LANTAU	x10	N	10.1	5	2	1.7	0	Y	
14-Oct-13	326	7	15:09:55	15:12:55	0:03:00	22.3021	113.9606	22.3027	113.9604	NE LANTAU	x20	N	3.5	3	2	1.2	0	N	
14-Oct-13	327	7	15:38:00	15:41:00	0:03:00	22.3158	113.9705	22.3163	113.9700	NE LANTAU	x10	N	14.4	5	1	1.1	0.5-2.0	N	
14-Oct-13	328	4	16:09:05	16:12:05	0:03:00	22.3235	113.9902	22.3226	113.9897	NE LANTAU	x10	N	13.1	5	0	0.6	0.5-2.0	N	
14-Oct-13	329	6	16:39:31	16:42:31	0:03:00	22.3309	114.0136	22.3308	114.0127	NE LANTAU	x10	N	9.6	5	1	0.6	0.5-2.0	N	
15-Oct-13	330	8	14:22:59	14:27:59	0:05:00	22.3664	113.9123	22.3655	113.9120	NW LANTAU	x10	N	20.5	5	3	4.2	0	Y	
15-Oct-13	331	10	14:46:55	14:51:55	0:05:00	22.3735	113.9137	22.3739	113.9133	NW LANTAU	x0	N	17.3	5	3	4.7	0	Y	Near Plant Power
15-Oct-13	332	5	15:06:20	15:09:20	0:03:00	22.3552	113.9213	22.3560	113.9211	NW LANTAU	x10	N	17.7	5	3	4.0	0	N	
15-Oct-13	333	5	15:21:50	15:24:50	0:03:00	22.3410	113.9307	22.3413	113.9301	NW LANTAU	x10	N	8.4	5	3	2.2	0	N	
15-Oct-13	334	7	15:47:00	15:50:00	0:03:00	22.3505	113.9532	22.3514	113.9523	NE LANTAU	x0	N	14.3	5	3	4.5	0	N	
15-Oct-13	335	5	16:16:42	16:19:47	0:03:05	22.3380	113.9667	22.3391	113.9649	NE LANTAU	x10	N	10.5	5	2	3.2	0	N	
15-Oct-13	336	11	16:47:15	16:50:15	0:03:00	22.3255	113.9800	22.3258	113.9790	NE LANTAU	x10	N	12.1	5	3	3.5	0	N	
15-Oct-13	337	2	17:17:50	17:20:50	0:03:00	22.3370	113.9985	22.3375	113.9976	NE LANTAU	x10	N	11.2	5	2	4.8	0	N	
15-Oct-13	338	1	19:17:20	19:19:35	0:02:15	22.3022	113.9711	22.3023	113.9712	NE LANTAU	x20	N	4.8	3	2	3.1	0	N	croaking sound heard
15-Oct-13	339	1	19:20:05	19:22:05	0:02:00	22.3022	113.9711	22.3023	113.9712	NE LANTAU	x20	N	4.8	3	2	1.6	0	N	at Pier B5 (20m)
15-Oct-13	340	1	19:22:52	19:24:52	0:02:00	22.3023	113.9711	22.3022	113.9711	NE LANTAU	x20	N	4.8	3	2	2.6	0	N	
15-Oct-13	341	1	19:50:01	19:52:01	0:02:00	22.3023	113.9712	22.3022	113.9711	NE LANTAU	x20	N	4.8	3	2	3.1	0	N	at Pier B5 (10m); croaking sound
15-Oct-13	342	1	19:55:08	19:57:08	0:02:00	22.3022	113.9713	22.3022	113.9713	NE LANTAU	x20	N	5.0	3	3	2.7	0	N	at Pier B5 (0m)
15-Oct-13	343	3	20:07:52	20:09:52	0:02:00	22.3022	113.9707	22.3022	113.9707	NE LANTAU	x20	N	4.8	3	2	3.5	0	N	at Pier B5 (50m); croaking sound

Appendix II. (cont'd)

Date	File #	No. Cues	Begin Time	End Time	Duration	Begin LAT	Begin LONG	End LAT	End LONG	Area	Gain	Gain Change?	Water Depth	Hp Depth	BSS	Wind Speed	Prec.	Dolphin Record?	Note(s)
15-Oct-13	344	3	20:19:17	20:21:28	0:02:11	22.3021	113.9702	22.3022	113.9702	NE LANTAU	x20	N	4.9	3	2	3.4	0	N	at Pier B5 (100m)
15-Oct-13	345	3	20:30:13	20:32:13	0:02:00	22.3022	113.9695	22.3023	113.9693	NE LANTAU	x20	N	4.7	3	2	3.3	0	N	at Pier B5 (200m)
15-Oct-13	346	3	20:39:15	20:41:15	0:02:00	22.3021	113.9684	22.3022	113.9684	NE LANTAU	x20	N	4.8	3	2	2.6	0	N	at Pier B5 (300m)
15-Oct-13	347	4	20:50:40	20:52:40	0:02:00	22.3021	113.9664	22.3021	113.9964	NE LANTAU	x20	N	4.7	3	2	1.4	0	N	at Pier B5 (500m)
15-Oct-13	348	1	21:08:10	21:10:10	0:02:00	22.3012	113.9715	22.3012	113.9715	NE LANTAU	x10	N	4.9	3	2	2.7	0	N	at Pier B7 (0m)
15-Oct-13	349	1	21:17:05	21:19:05	0:02:00	22.3012	113.9713	22.3012	113.9713	NE LANTAU	x10	N	5.1	3	2	3.1	0	N	at Pier B7 (10m)
15-Oct-13	350	2	21:25:03	21:28:03	0:03:00	22.3012	113.9711	22.3011	113.9711	NE LANTAU	x10	N	5.1	3	2	3.5	0	N	at Pier B7 (20m)
15-Oct-13	352	3	21:34:03	21:36:03	0:02:00	22.3012	113.9709	22.3011	113.9709	NE LANTAU	x10	N	5.0	3	2	4.2	0	N	at Pier B7 (50m)
15-Oct-13	353	3	21:43:29	21:45:29	0:02:00	22.3011	113.9704	22.3011	113.9703	NE LANTAU	x10	N	5.1	3	2	4.1	0	N	at Pier B7 (100m)
15-Oct-13	354	3	21:54:20	21:56:20	0:02:00	22.3010	113.9694	22.3010	113.9694	NE LANTAU	x10	N	5.1	3	2	2.6	0	N	at Pier B7 (200m)
15-Oct-13	355	5	22:05:45	22:07:45	0:02:00	22.3011	113.9685	22.3010	113.9684	NE LANTAU	x10	N	5.2	3	2	3.8	0	N	at Pier B7 (300m)
15-Oct-13	356	4	22:17:03	22:19:03	0:02:00	22.3011	113.9665	22.3010	113.9664	NE LANTAU	x10	N	5.2	3	2	3.9	0	N	at Pier B7 (500m)
15-Oct-13	357	3	23:09:35	23:12:35	0:03:00	22.3022	113.9687	22.3022	113.9687	NE LANTAU	x10	N	4.3	3	2	2.9	0	N	
15-Oct-13	358	3	23:35:58	23:38:58	0:03:00	22.3024	113.9689	22.3024	113.9689	NE LANTAU	x20	N	4.1	3	2	1.7	0	N	
16-Oct-13	359	4	0:07:25	0:10:25	0:03:00	22.3023	113.9688	22.3023	113.9688	NE LANTAU	x20	N	4.2	3	2	2.6	0	N	
16-Oct-13	360	3	1:05:10	1:08:10	0:03:00	22.3022	113.9687	22.3023	113.9688	NE LANTAU	x20	N	3.9	3	2	3.8	0	N	
16-Oct-13	361	3	1:59:27	2:02:27	0:03:00	22.3019	113.9687	22.3018	113.9687	NE LANTAU	x20	N	4.0	3	2	1.6	0	N	
16-Oct-13	362	3	3:03:40	3:06:40	0:03:00	22.3018	113.9687	22.3019	113.9687	NE LANTAU	x20	N	4.4	3	2	1.2	0	N	
16-Oct-13	363	3	4:03:50	4:05:50	0:02:00	22.3018	113.9687	22.3018	113.9687	NE LANTAU	x20	N	4.4	3	2	2.1	0	N	
16-Oct-13	364	3	6:03:55	6:06:56	0:03:01	22.3015	113.9689	22.3017	113.9687	NE LANTAU	x20	N	5.5	3	2	2.3	0	N	
16-Oct-13	365	3	6:28:30	6:30:30	0:02:00	22.3016	113.9688	22.3017	113.9687	NE LANTAU	x20	N	5.2	3	2	2.9	0	N	
16-Oct-13	366	3	6:52:44	6:55:44	0:03:00	22.3016	113.9687	22.3016	113.9688	NE LANTAU	x20	N	5.2	3	3	2.8	0	N	
16-Oct-13	367	5	7:22:46	7:25:46	0:03:00	22.3061	113.9616	22.3059	113.9611	NE LANTAU	x10	N	5.0	3	3	3.8	0	N	
16-Oct-13	368	5	7:43:01	7:46:01	0:03:00	22.3080	113.9710	22.3075	113.9708	NE LANTAU	x20	N	5.3	3	3	4.5	0	N	
16-Oct-13	369	5	8:02:35	8:05:35	0:03:00	22.3066	113.9778	22.3065	113.9778	NE LANTAU	x20	N	5.8	3	3	3.9	0	N	
16-Oct-13	370	1	8:22:59	8:26:01	0:03:02	22.3237	113.9886	22.3234	113.9883	NE LANTAU	x10/x0	Y	13.2	5	3	4.7	0	N	snapping shrimp sound
16-Oct-13	371	5	8:43:50	8:46:50	0:03:00	22.3351	113.9981	22.3345	113.9980	NE LANTAU	x10	N	9.8	5	4	4.3	0	N	
16-Oct-13	372	0	9:03:00	9:06:00	0:03:00	22.3352	114.0137	22.3351	114.0139	NE LANTAU	x10	N	11.6	5	3	2.9	0	N	
16-Oct-13	373	0	9:32:35	9:35:35	0:03:00	22.3401	113.9961	22.3397	113.9967	NE LANTAU	x10	N	15.3	5	4	4.0	0	N	
16-Oct-13	374	7	10:02:00	10:05:00	0:03:00	22.3252	113.9798	22.3249	113.9799	NE LANTAU	x10	N	13.0	5	4	4.5	0	N	
16-Oct-13	375	2	10:32:33	10:35:33	0:03:00	22.3387	113.9668	22.3389	113.9670	NE LANTAU	x10	N	11.6	5	4	4.2	0	N	
16-Oct-13	376	5	11:09:30	11:13:00	0:03:30	22.3302	113.9255	22.3295	113.9255	NW LANTAU	x10	N	8.5	5	3	4.8	0	N	
16-Oct-13	377	4	11:25:25	11:28:25	0:03:00	22.3215	113.9044	22.3211	113.9037	NW LANTAU	x10	N	6.6	5	3	2.0	0	N	
17-Oct-13	378	4	9:32:16	9:35:16	0:03:00	22.3361	113.9981	22.3366	113.9975	NE LANTAU	x20	N	11.0	5	3	3.7	0	N	
17-Oct-13	379	5	10:02:26	10:05:26	0:03:00	22.3259	113.9802	22.3264	113.9799	NE LANTAU	x10	N	12.3	5	3	3.0	0	N	
17-Oct-13	380	7	10:32:02	10:35:02	0:03:00	22.3426	113.9675	22.3427	113.9679	NE LANTAU	x10	N	15.6	5	4	4.3	0	N	
17-Oct-13	381	10	11:02:38	11:05:41	0:03:03	22.3480	113.9599	22.3476	113.9604	NE LANTAU	x10	N	16.5	5	3	5.0	0	N	
17-Oct-13	382	5	11:31:55	11:34:55	0:03:00	22.3356	113.9315	22.3354	113.9316	NW LANTAU	x10	N	8.2	5	3	3.8	0	N	
17-Oct-13	383	0	12:58:52	13:01:52	0:03:00	22.3305	113.9039	22.3287	113.9026	NW LANTAU	x10	N	6.6	3	4	4.0	0	N	snapping shrimp sound
17-Oct-13	384	6	13:20:04	13:23:04	0:03:00	22.3314	113.9323	22.3309	113.9323	NW LANTAU	x20	N	8.2	5	4	3.8	0	N	
17-Oct-13	385	7	14:04:14	14:07:15	0:03:01	22.3064	113.9618	22.3060	113.9612	NE LANTAU	x20	N	3.9	3	3	2.9	0	N	
17-Oct-13	386	7	14:32:20	14:35:22	0:03:02	22.3133	113.9747	22.3135	113.9742	NE LANTAU	x20	N	13.4	5	2	1.4	0	N	
17-Oct-13	387	2	15:01:54	15:04:54	0:03:00	22.3170	113.9926	22.3172	113.9921	NE LANTAU	x20	N	7.0	5	2	3.3	0	N	snapping shrimp sound
17-Oct-13	388	2	15:32:16	15:35:46	0:03:30	22.3310	114.0134	22.3313	114.0126	NE LANTAU	x10	N	10.5	5	2	2.9	0	N	
17-Oct-13	389	8	16:03:23	16:06:23	0:03:00	22.3449	113.9761	22.3453	113.9750	NE LANTAU	x10	N	32.4	5	2	3.7	0	N	
18-Oct-13	390	4	9:33:43	9:36:43	0:03:00	22.3395	114.0014	22.3394	114.0008	NE LANTAU	x10	N	18.4	5	3	2.7	0	N	
18-Oct-13	391	3	10:02:35	10:05:35	0:03:00	22.3345	113.9854	22.3342	113.9852	NE LANTAU	x20	N	6.4	5	3	4.1	0	N	
18-Oct-13	392	6	10:33:18	10:36:18	0:03:00	22.3459	113.9696	22.3455	113.9694	NE LANTAU	x10	N	27.8	5	3	3.2	0	N	
18-Oct-13	393	6	11:03:08	11:06:08	0:03:00	22.3458	113.9600	22.3459	113.9602	NE LANTAU	x10	N	21.8	5	3	5.2	0	N	
18-Oct-13	394	6	12:24:18	12:30:18	0:06:00	22.3714	113.8931	22.3676	113.8940	NW LANTAU	x20/x10	Y	14.2	5	3	5.9	0	Y	
18-Oct-13	395	2	12:30:50	12:35:50	0:05:00	22.3676	113.8940	22.3641	113.8949	NW LANTAU	x10	N	14.2	5	3	5.0	0	Y	
18-Oct-13	396	3	12:51:35	12:56:35	0:05:00	22.3751	113.8931	22.3724	113.8936	NW LANTAU	x10	N	18.1	5	3	3.6	0	Y	snapping shrimp sound
18-Oct-13	397	1	13:05:36	13:10:36	0:05:00	22.3811	113.8923	22.3782	113.8932	NW LANTAU	x10	N	21.7	5	2	2.6	0	Y	
18-Oct-13	398	1	13:20:08	13:25:08	0:05:00	22.3856	113.8887	22.3825	113.8888	NW LANTAU	x10	N	20.5	5	2	2.6	0	Y	
18-Oct-13	399	0	13:25:19	13:30:19	0:05:00	22.3824	113.8888	22.3793	113.8894	NW LANTAU	x10	N	20.5	5	2	2.1	0	Y	snapping shrimp sound
18-Oct-13	400	5	14:10:12	14:13:14	0:03:02	22.3242	113.9019	22.3226	113.9014	NW LANTAU	x10/x20	Y	6.9	5	2	2.7	0	N	
18-Oct-13	401	4	14:21:00	14:24:00	0:03:00	22.3241	113.9119	22.3232	113.9119	NW LANTAU	x10/x20	Y	5.5	3	3	2.7	0	N	
18-Oct-13	402	3	14:32:09	14:35:09	0:03:00	22.3286	113.9217	22.3283	113.9219	NW LANTAU	x20/x10	Y	5.5	3	2	0.4	0	Y	
18-Oct-13	403	5	15:24:58	15:27:26	0:02:28	22.3091	113.9642	22.3094	113.9643	NE LANTAU	x20	N	3.9	3	0	0.4	0	N	

Appendix II. (cont'd)

Date	File #	No. Cues	Begin Time	End Time	Duration	Begin LAT	Begin LONG	End LAT	End LONG	Area	Gain	Gain Change?	Water Depth	Hp Depth	BSS	Wind Speed	Prec.	Dolphin Record?	Note(s)
18-Oct-13	404	4	15:56:35	15:59:34	0:02:59	22.3127	113.9809	22.3131	113.9803	NE LANTAU	x20	N	5.1	3	1	3.4	0	N	
18-Oct-13	405	4	16:22:22	16:25:22	0:03:00	22.3305	113.9993	22.3305	113.9993	NE LANTAU	x10	N	11.8	5	2	3.3	0	N	
19-Oct-13	406	3	10:22:25	10:25:25	0:03:00	22.3318	113.9848	22.3313	113.9847	NE LANTAU	x20	N	10.6	5	2	1.1	0	N	
19-Oct-13	407	10	10:48:40	10:54:00	0:05:20	22.3337	113.9728	22.3320	113.9732	NE LANTAU	x20/x10	Y	8.2	5	3	3.6	0	Y	
19-Oct-13	409	7	11:04:01	11:09:01	0:05:00	22.3350	113.9680	22.3339	113.9688	NE LANTAU	x0	N	7.8	5	3	2.8	0	Y	
19-Oct-13	410	7	11:22:47	11:27:47	0:05:00	22.3397	113.9627	22.3391	113.9649	NE LANTAU	x0/x10	Y	12.0	5	3	2.1	0	Y	
19-Oct-13	411	5	11:36:10	11:39:10	0:03:00	22.3393	113.9582	22.3393	113.9587	NE LANTAU	x10	N	11.0	5	2	2.8	0	Y	
19-Oct-13	412	9	12:03:03	12:08:03	0:05:00	22.3429	113.9456	22.3426	113.9469	NW LANTAU	x0	N	14.2	5	2	2.1	0	Y	
19-Oct-13	413	5	12:20:50	12:24:52	0:04:02	22.3491	113.9434	22.3488	113.9448	NW LANTAU	x0	N	22.9	5	2	0.5	0	Y	
19-Oct-13	414	8	12:34:09	12:37:18	0:03:09	22.3523	113.9412	22.3517	113.9424	NW LANTAU	x0	N	22.3	5	2	0.6	0	Y	
19-Oct-13	415	9	12:50:10	12:55:10	0:05:00	22.3537	113.9362	22.3523	113.9382	NW LANTAU	x0	N	24.3	5	2	3.2	0	Y	
19-Oct-13	416	6	13:15:10	13:20:10	0:05:00	22.3578	113.9283	22.3560	113.9296	NW LANTAU	x0	N	21.6	5	2	1.6	0	Y	
19-Oct-13	417	4	14:07:30	14:10:30	0:03:00	22.3357	113.9088	22.3342	113.9097	NW LANTAU	x10	N	4.6	3	3	4.9	0	N	
19-Oct-13	418	4	14:25:50	14:28:50	0:03:00	22.3304	113.9253	22.3294	113.9264	NW LANTAU	x10	N	7.9	5	2	3.2	0	N	
19-Oct-13	419	4	14:36:50	14:39:50	0:03:00	22.3322	113.9393	22.3316	113.9410	NW LANTAU	x10	N	9.6	5	3	2.7	0	N	
19-Oct-13	420	6	15:26:10	15:29:10	0:03:00	22.3086	113.9713	22.3090	113.9715	NE LANTAU	x10	N	4.2	3	2	2.6	0	N	
19-Oct-13	421	4	16:20:00	16:23:00	0:03:00	22.3315	114.0145	22.3319	114.0146	NE LANTAU	x10	N	10.5	5	2	0.8	0	N	
20-Oct-13	422	2	9:40:40	9:45:40	0:05:00	22.3302	113.9892	22.3301	113.9886	NE LANTAU	x20/x10	Y	10.0	5	2	0.9	0	Y	
20-Oct-13	423	2	10:17:55	10:23:10	0:05:15	22.3173	113.9774	22.3172	113.9775	NE LANTAU	x10	N	9.8	5	1	1.8	0	Y	
20-Oct-13	424	0	10:23:20	10:28:20	0:05:00	22.3172	113.9775	22.3173	113.9778	NE LANTAU	x10	N	9.7	5	1	0.6	0	Y	
20-Oct-13	425	1	10:28:30	10:33:30	0:05:00	22.3173	113.9778	22.3174	113.9781	NE LANTAU	x10	N	9.9	5	1	1.4	0	Y	
20-Oct-13	426	6	10:41:47	10:46:47	0:05:00	22.3192	113.9794	22.3195	113.9798	NE LANTAU	x10	N	11.4	5	1	0.3	0	Y	
20-Oct-13	427	7	10:55:11	11:00:11	0:05:00	22.3157	113.9848	22.3162	113.9855	NE LANTAU	x10	N	10.4	5	1	0.3	0	Y	
20-Oct-13	428	8	11:59:44	12:02:44	0:03:00	22.3295	113.9600	22.3297	113.9607	NE LANTAU	x10	N	8.3	5	2	1.3	0	N	
20-Oct-13	429	3	12:23:15	12:26:15	0:03:00	22.3361	113.9273	22.3356	113.9282	NW LANTAU	x10	N	8.5	5	2	2.7	0	N	
20-Oct-13	430	2	12:57:57	13:02:57	0:05:00	22.3388	113.8924	22.3377	113.8926	NW LANTAU	x10	N	9.7	5	2	2.4	0	Y	
20-Oct-13	431	5	13:14:08	13:19:08	0:05:00	22.3449	113.8949	22.3433	113.8958	NW LANTAU	x10	N	11.1	5	2	2.3	0	Y	
20-Oct-13	432	2	13:34:55	13:39:55	0:05:00	22.3511	113.8932	22.3493	113.8943	NW LANTAU	x10	N	9.1	5	2	2.7	0	Y	
20-Oct-13	433	0	13:49:15	13:54:15	0:05:00	22.3548	113.8930	22.3526	113.8944	NW LANTAU	x10	N	9.0	5	3	4.2	0	Y	
20-Oct-13	434	0	14:21:40	14:24:40	0:03:00	22.3284	113.9145	22.3273	113.9156	NW LANTAU	x10	N	6.7	5	3	4.2	0	N	
20-Oct-13	435	3	14:37:00	14:40:00	0:03:00	22.3303	113.9358	22.3295	113.9382	NW LANTAU	x0	N	7.1	5	3	2.8	0	N	
20-Oct-13	436	9	15:22:44	15:25:44	0:03:00	22.3495	113.9758	22.3493	113.9776	NE LANTAU	x10	N	15.6	5	2	3.4	0	N	
20-Oct-13	437	0	16:09:05	16:12:05	0:03:00	22.3379	114.0048	22.3375	114.0057	NE LANTAU	x10	N	14.8	5	2	2.5	0	N	
21-Oct-13	438	4	9:37:24	9:41:24	0:04:00	22.3309	113.9868	22.3303	113.9861	NE LANTAU	x10	N	9.8	5	1	0.7	0	Y	
21-Oct-13	439	1	10:17:23	10:20:23	0:03:00	22.3358	113.9773	22.3359	113.9775	NE LANTAU	x20	N	5.8	3	2	0.5	0	N	
21-Oct-13	440	5	10:57:41	11:03:01	0:05:20	22.3436	113.9660	22.3428	113.9651	NE LANTAU	X10	N	23.7	5	2	2.2	0	Y	
21-Oct-13	441	5	11:11:19	11:16:19	0:05:00	22.3397	113.9549	22.3395	113.9540	NE LANTAU	x10/x0	Y	11.0	5	2	1.0	0	Y	
21-Oct-13	442	6	11:25:33	11:30:33	0:05:00	22.3398	113.9432	22.3403	113.9428	NE LANTAU	x20	N	28.7	5	2	0.3	0	Y	
21-Oct-13	443	3	12:03:53	12:06:23	0:02:30	22.3037	113.9703	22.3037	113.9705	NE LANTAU	x20	N	4.8	3	2	1.3	0	N	at Pier B2 (0m)
21-Oct-13	444	4	12:11:01	12:13:01	0:02:00	22.3036	113.9702	22.3036	113.9701	NE LANTAU	x20	N	4.9	3	2	1.9	0	N	at Pier B2 (10m)
21-Oct-13	445	4	12:14:51	12:16:51	0:02:00	22.3036	113.9701	22.3036	113.9701	NE LANTAU	x20	N	4.9	3	2	1.0	0	N	at Pier B2 (20m)
21-Oct-13	446	4	12:22:12	12:24:12	0:02:00	22.3036	113.9698	22.3037	113.9698	NE LANTAU	x20	N	4.9	3	2	2.4	0	N	at Pier B2 (50m)
21-Oct-13	447	6	12:28:28	12:30:28	0:02:00	22.3034	113.9693	22.3034	113.9693	NE LANTAU	x20	N	5.0	3	2	3.5	0	N	at Pier B2 (100m)
21-Oct-13	448	4	12:37:00	12:39:00	0:02:00	22.3035	113.9683	22.3035	113.9683	NE LANTAU	x20	N	4.7	3	2	2.6	0	N	at Pier B2 (200m)
21-Oct-13	449	5	12:45:00	12:47:00	0:02:00	22.3037	113.9673	22.3037	113.9673	NE LANTAU	x20	N	4.6	3	2	3.3	0	N	at Pier B2 (300m)
21-Oct-13	450	4	12:54:30	12:56:30	0:02:00	22.3037	113.9654	22.3037	113.9654	NE LANTAU	x20	N	4.7	3	2	2.9	0	N	at Pier B2 (500m)
21-Oct-13	451	4	13:13:33	13:15:33	0:02:00	22.3017	113.9713	22.3018	113.9715	NE LANTAU	x20	N	5.2	3	2	3.2	0	N	at Pier B6 (10m)
21-Oct-13	452	4	13:20:32	13:22:33	0:02:01	22.3017	113.9712	22.3017	113.9712	NE LANTAU	x20	N	5.1	3	2	3.3	0	N	at Pier B6 (20m)
21-Oct-13	453	2	13:27:18	13:29:18	0:02:00	22.3017	113.9714	22.3017	113.9714	NE LANTAU	x20	N	5.1	3	2	1.1	0	N	at Pier B6 (0m)
21-Oct-13	454	5	13:33:35	13:35:35	0:02:00	22.3017	113.9709	22.3018	113.9709	NE LANTAU	x20	N	5.1	3	2	2.6	0	N	at Pier B6 (50m)
21-Oct-13	455	3	13:41:18	13:43:22	0:02:04	22.3017	113.9704	22.3016	113.9703	NE LANTAU	x20	N	4.9	3	2	2.8	0	N	at Pier B6 (100m)
21-Oct-13	456	4	13:45:37	13:47:37	0:02:00	22.3017	113.9703	22.3016	113.9703	NE LANTAU	x20	N	4.9	3	2	2.6	0	N	at Pier B6 (100m)
21-Oct-13	457	8	13:54:33	13:56:33	0:02:00	22.3018	113.9695	22.3018	113.9695	NE LANTAU	x20	N	4.8	3	2	1.0	0	N	at Pier B6 (200m)
21-Oct-13	458	6	14:03:12	14:05:12	0:02:00	22.3017	113.9685	22.3017	113.9685	NE LANTAU	x20	N	4.5	3	2	2.1	0	N	at Pier B6 (300m)
21-Oct-13	459	5	14:11:46	14:13:46	0:02:00	22.3017	113.9665	22.3017	113.9665	NE LANTAU	x20	N	4.4	3	2	1.8	0	N	at Pier B6 (500m)
21-Oct-13	460	0	15:22:30	15:25:30	0:03:00	22.3253	113.9998	22.3255	114.0019	NE LANTAU	x20	N	13.4	5	2	2.1	0	N	snapping shrimp and croaker sound
21-Oct-13	461	3	16:27:25	16:31:25	0:04:00	22.3419	113.9781	22.3420	113.9799	NE LANTAU	x10/x0	Y	13.3	5	2	2.9	0	Y	noise generated by boat propeller from 02:00-04:00

Appendix II. (cont'd)

Date	File #	No. Cues	Begin Time	End Time	Duration	Begin LAT	Begin LONG	End LAT	End LONG	Area	Gain	Gain Change?	Water Depth	Hp Depth	BSS	Wind Speed	Prec.	Dolphin Record?	Note(s)
22-Oct-13	462	5	12:59:20	13:02:20	0:03:00	22.3260	113.9771	22.3258	113.9771	NE LANTAU	x10	N	8.1	5	2	2.0	0	N	
22-Oct-13	463	6	13:37:36	13:40:36	0:03:00	22.3292	113.9615	22.3292	113.9624	NE LANTAU	x0	N	8.4	5	2	3.7	0	N	
22-Oct-13	464	7	14:24:25	14:27:25	0:03:00	22.3153	113.9669	22.3152	113.9675	NE LANTAU	x10	N	7.3	5	2	4.3	0	N	
22-Oct-13	465	0	16:17:12	16:22:12	0:05:00	22.3379	113.9746	22.3377	113.9760	NE LANTAU	x0	N	5.5	3	2	5.3	0	Y	
22-Oct-13	466	4	16:47:55	16:52:55	0:05:00	22.3389	113.9742	22.3394	113.9750	NE LANTAU	x0	N	6.5	3	2	3.3	0	Y	
22-Oct-13	467	9	17:09:49	17:14:49	0:05:00	22.3280	113.9732	22.3284	113.9736	NE LANTAU	x10	N	8.4	5	2	1.7	0	Y	
22-Oct-13	468	2	17:22:22	17:27:22	0:05:00	22.3235	113.9789	22.3231	113.9790	NE LANTAU	x10	N	11.5	5	2	2.3	0	Y	croaking sound heard
22-Oct-13	469	3	17:37:03	17:42:18	0:05:15	22.3172	113.9844	22.3169	113.9840	NE LANTAU	x10	N	7.5	5	2	3.5	0	Y	
22-Oct-13	470	1	17:54:00	17:59:00	0:05:00	22.3190	113.9897	22.3186	113.9892	NE LANTAU	x10	N	10.8	5	2	2.7	0	Y	croaking sound heard
22-Oct-13	473	1	18:02:40	18:07:40	0:05:00	22.3183	113.9888	22.3179	113.9881	NE LANTAU	x10	N	10.3	5	2	2.6	0	Y	croaking sound heard
22-Oct-13	474	3	19:05:13	19:08:13	0:03:00	22.3017	113.9684	22.3017	113.9684	NE LANTAU	x20	N	4.5	3	2	2.0	0	N	croaking sound heard
22-Oct-13	475	3	20:14:10	20:17:10	0:03:00	22.3016	113.9684	22.3016	113.9684	NE LANTAU	x20	N	5.1	3	2	1.4	0	N	croaking sound heard
22-Oct-13	477	3	20:48:15	20:51:15	0:03:00	22.3017	113.9684	22.3017	113.9684	NE LANTAU	x20	N	4.9	3	2	1.8	0	N	croaking sound heard
22-Oct-13	478	6	21:16:50	21:19:50	0:03:00	22.3017	113.9684	22.3018	113.9684	NE LANTAU	x20	N	5.0	3	2	1.7	0	N	croaking sound heard
22-Oct-13	479	3	21:50:28	21:53:28	0:03:00	22.3018	113.9684	22.3019	113.9685	NE LANTAU	x20	N	5.0	3	2	2.6	0	N	
22-Oct-13	480	3	22:15:41	22:18:41	0:03:00	22.3019	113.9685	22.3019	113.9686	NE LANTAU	x20	N	5.1	3	2	1.8	0	N	
22-Oct-13	481	3	22:47:53	22:49:53	0:02:00	22.3019	113.9686	22.3019	113.9687	NE LANTAU	x20	N	5.3	3	2	1.2	0	N	
22-Oct-13	482	4	23:20:40	23:23:40	0:03:00	22.3019	113.9685	22.3019	113.9686	NE LANTAU	x20	N	5.3	3	2	2.1	0	N	
22-Oct-13	483	3	23:52:55	23:55:55	0:03:00	22.3019	113.9686	22.3019	113.9686	NE LANTAU	x20	N	5.2	3	3	1.6	0	N	
23-Oct-13	484	3	0:48:10	0:51:10	0:03:00	22.3013	113.9686	22.3013	113.9686	NE LANTAU	x20	N	5.6	3	2	0.8	0	N	
23-Oct-13	485	3	1:46:05	1:49:05	0:03:00	22.3019	113.9687	22.3019	113.9687	NE LANTAU	x20	N	5.0	3	2	2.8	0	N	
23-Oct-13	486	3	2:49:15	2:52:15	0:03:00	22.3018	113.9689	22.3019	113.9689	NE LANTAU	x20	N	4.7	3	2	0.9	0	N	
23-Oct-13	487	3	3:45:58	3:48:58	0:03:00	22.3013	113.9690	22.3013	113.9687	NE LANTAU	x20	N	4.6	3	3	3.3	0	N	
23-Oct-13	488	3	4:46:07	4:49:07	0:03:00	22.3019	113.9689	22.3019	113.9689	NE LANTAU	x30	N	3.8	3	2	1.1	0	N	
23-Oct-13	489	3	5:48:00	5:51:00	0:03:00	22.3019	113.9686	22.3019	113.9686	NE LANTAU	x20	N	3.6	3	2	1.6	0	N	
23-Oct-13	490	4	6:17:53	6:20:53	0:03:00	22.3018	113.9685	22.3018	113.9685	NE LANTAU	x20	N	3.4	3	1	1.2	0	N	
23-Oct-13	491	5	6:45:48	6:48:48	0:03:00	22.3012	113.9685	22.3012	113.9685	NE LANTAU	x20	N	4.1	3	2	1.2	0	N	
23-Oct-13	492	4	7:21:47	7:24:47	0:03:00	22.3099	113.9623	22.3094	113.9619	NE LANTAU	x20	N	4.9	3	2	2.1	0	N	
23-Oct-13	493	5	7:57:30	8:00:30	0:03:00	22.3123	113.9806	22.3121	113.9799	NE LANTAU	x20	N	4.9	3	2	3.2	0	N	
23-Oct-13	494	2	8:18:22	8:21:22	0:03:00	22.3182	113.9911	22.3173	113.9908	NE LANTAU	x20	N	10.3	5	2	1.6	0	N	
23-Oct-13	495	3	8:49:12	8:54:12	0:05:00	22.3309	113.9942	22.3298	113.9923	NE LANTAU	x20	N	8.8	5	3	4.7	0	Y	
23-Oct-13	496	0	9:32:28	9:35:28	0:03:00	22.3316	114.0135	22.3309	114.0129	NE LANTAU	x20	N	12.8	5	3	3.8	0	N	
23-Oct-13	497	4	10:19:36	10:22:36	0:03:00	22.3444	113.9850	22.3441	113.9839	NE LANTAU	x20/x10	Y	29.3	5	3	2.5	0	N	
23-Oct-13	498	5	11:01:40	11:06:40	0:05:00	22.3439	113.9739	22.3431	113.9730	NE LANTAU	x10	N	29.7	5	3	4.4	0	Y	
24-Oct-13	499	3	9:48:33	9:51:33	0:03:00	22.3347	113.9854	22.3338	113.9842	NE LANTAU	x20	N	5.2	3	3	4.3	0	N	
24-Oct-13	500	5	10:32:50	10:35:50	0:03:00	22.3294	113.9605	22.3294	113.9593	NE LANTAU	x10	N	8.4	5	4	5.7	0	N	
24-Oct-13	501	4	12:35:19	12:40:19	0:05:00	22.3860	113.8951	22.3858	113.8958	NW LANTAU	x20	N	21.7	5	3	6.2	0	Y	
24-Oct-13	502	5	13:04:04	13:09:04	0:05:00	22.3861	113.9032	22.3867	113.9039	NW LANTAU	x0	N	17.3	5	3	3.0	0	Y	
24-Oct-13	503	8	13:15:37	13:20:39	0:05:02	22.3856	113.9045	22.3860	113.9047	NW LANTAU	x10	N	15.3	5	3	3.8	0	Y	
24-Oct-13	504	5	13:20:51	13:26:05	0:05:14	22.3860	113.9047	22.3866	113.9054	NW LANTAU	x10	N	14.3	5	3	5.6	0	Y	
24-Oct-13	505	2	13:26:23	13:31:23	0:05:00	22.3866	113.9054	22.3871	113.9061	NW LANTAU	x10	N	12.3	5	3	3.6	0	Y	
24-Oct-13	506	7	13:31:35	13:36:35	0:05:00	22.3872	113.9061	22.3875	113.9067	NW LANTAU	x10	N	11.6	5	3	3.6	0	Y	
24-Oct-13	507	7	13:36:55	13:41:55	0:05:00	22.3875	113.9067	22.3878	113.9071	NW LANTAU	x10	N	10.5	5	3	3.2	0	Y	
24-Oct-13	508	5	13:52:45	13:57:47	0:05:02	22.3881	113.9089	22.3875	113.9096	NW LANTAU	x10	N	6.8	5	2	2.0	0	Y	
24-Oct-13	509	6	13:58:54	14:03:54	0:05:00	22.3875	113.9099	22.3869	113.9107	NW LANTAU	x10	N	6.8	5	2	1.9	0	Y	
24-Oct-13	510	6	14:10:30	14:15:30	0:05:00	22.3862	113.9114	22.3851	113.9122	NW LANTAU	x10	N	4.9	3	2	2.5	0	Y	
24-Oct-13	511	4	14:45:12	14:50:12	0:05:00	22.3509	113.9105	22.3503	113.9117	NW LANTAU	x10	N	9.8	5	2	2.6	0	Y	
24-Oct-13	512	3	15:07:15	15:12:15	0:05:00	22.3503	113.9111	22.3494	113.9122	NW LANTAU	x10	N	9.9	5	3	4.0	0	Y	
24-Oct-13	514	3	15:28:23	15:31:23	0:03:00	22.3386	113.9171	22.3379	113.9182	NW LANTAU	x10	N	7.3	5	3	2.9	0	N	
24-Oct-13	515	3	13:36:00	13:39:05	0:03:05	22.3377	113.9229	22.3371	113.9238	NW LANTAU	x10	N	8.0	5	3	4.7	0	N	
24-Oct-13	516	1	16:32:49	16:35:49	0:03:00	22.3374	114.0140	22.3373	114.0147	NE LANTAU	x10	N	21.0	5	3	3.6	0	N	
25-Oct-13	517	5	10:10:50	10:13:50	0:03:00	22.3251	113.9800	22.3224	113.9774	NE LANTAU	x20	N	~13	5	3	2.3	0	N	
25-Oct-13	518	6	10:50:00	10:53:00	0:03:00	22.3274	113.9646	22.3275	113.9635	NE LANTAU	x10	N	~11	5	2	1.5	0	N	
25-Oct-13	519	6	11:29:00	11:32:00	0:03:00	22.3366	113.9209	22.3364	113.9205	NW LANTAU	x10	N	~8	5	3	3.5	0	N	
25-Oct-13	520	4	12:30:30	12:35:30	0:05:00	22.3817	113.8862	22.3812	113.8857	NW LANTAU	x10	N	~18	5	3	2.8	0	Y	
25-Oct-13	521	2	12:35:45	12:40:45	0:05:00	22.3812	113.8857	22.3806	113.8853	NW LANTAU	x10	N	~18	5	3	3.8	0	Y	
25-Oct-13	522	5	13:40:12	13:43:12	0:03:00	22.3362	113.9151	22.3357	113.9148	NW LANTAU	x10	N	~7	5	4	2.0	0	N	
25-Oct-13	523	4	14:47:30	14:50:30	0:03:00	22.3051	113.9722	22.3044	113.9720	NE LANTAU	x10	N	~4.5	3	3	4.5	0	N	
25-Oct-13	524	2	15:33:40	15:36:40	0:03:00	22.3238	113.9992	22.3235	113.9989	NE LANTAU	x10	N	~8	5	4	4.4	0	N	

Appendix III. Sighting records of Chinese White Dolphins during baseline period of TM-CLKL acoustic monitoring

DATE	STG #	TIME	HRD SZ	AREA	BEAU	TYPE	LATITUDE	LONGITUDE	SEASON	BOAT ASSOC.	RECORDING
26-Sep-13	1	1447	2	NW LANTAU	3	TMCLKL	22.3802	113.8879	AUTUMN	NONE	N
26-Sep-13	2	1615	2	NW LANTAU	3	TMCLKL	22.2967	113.8773	AUTUMN	NONE	N
27-Sep-13	1	1050	6	NW LANTAU	3	TMCLKL	22.3720	113.8878	AUTUMN	NONE	Y
27-Sep-13	2	1245	5	NE LANTAU	2	TMCLKL	22.3294	113.9585	AUTUMN	NONE	Y
27-Sep-13	3	1339	11	NW LANTAU	3	TMCLKL	22.3347	113.9394	AUTUMN	NONE	Y
28-Sep-13	1	1508	4	NW LANTAU	2	TMCLKL	22.3830	113.8822	AUTUMN	NONE	Y
28-Sep-13	2	1615	1	NW LANTAU	2	TMCLKL	22.2955	113.8800	AUTUMN	NONE	N
29-Sep-13	1	1014	1	NW LANTAU	3	TMCLKL	22.3751	113.8759	AUTUMN	NONE	N
1-Oct-13	1	1022	9	NW LANTAU	2	TMCLKL	22.3789	113.8894	AUTUMN	PURSE SEINE	Y
1-Oct-13	2	1227	1	NW LANTAU	2	TMCLKL	22.3321	113.9057	AUTUMN	NONE	N
1-Oct-13	3	1356	5	NE LANTAU	1	TMCLKL	22.3311	113.9755	AUTUMN	NONE	Y
2-Oct-13	1	1412	5	NW LANTAU	2	TMCLKL	22.3811	113.8871	AUTUMN	NONE	Y
2-Oct-13	2	1530	1	NW LANTAU	3	TMCLKL	22.3753	113.9133	AUTUMN	NONE	Y
4-Oct-13	1	1123	8	NW LANTAU	2	TMCLKL	22.3629	113.8759	AUTUMN	NONE	Y
4-Oct-13	2	1523	1	NE LANTAU	3	TMCLKL	22.3320	114.0080	AUTUMN	NONE	N
5-Oct-13	1	1211	4	NW LANTAU	2	TMCLKL	22.3493	113.8949	AUTUMN	NONE	Y
5-Oct-13	2	1249	8	NW LANTAU	2	TMCLKL	22.3569	113.9053	AUTUMN	NONE	Y
5-Oct-13	3	1413	5	NW LANTAU	2	TMCLKL	22.3662	113.8769	AUTUMN	NONE	Y
5-Oct-13	4	1526	1	NE LANTAU	2	TMCLKL	22.3336	113.9747	AUTUMN	NONE	N
6-Oct-13	1	954	1	NW LANTAU	3	TMCLKL	22.3303	113.8858	AUTUMN	NONE	N
6-Oct-13	2	1056	10	NW LANTAU	2	TMCLKL	22.3528	113.8942	AUTUMN	NONE	Y
6-Oct-13	3	1152	6	NW LANTAU	3	TMCLKL	22.3374	113.9011	AUTUMN	NONE	Y
6-Oct-13	4	1217	7	NW LANTAU	3	TMCLKL	22.3386	113.8940	AUTUMN	NONE	Y
6-Oct-13	5	1308	1	NW LANTAU	3	TMCLKL	22.3390	113.9426	AUTUMN	NONE	N
6-Oct-13	6	1445	1	NE LANTAU	3	TMCLKL	22.3418	114.0095	AUTUMN	NONE	N
7-Oct-13	1	1156	10	NE LANTAU	3	TMCLKL	22.3444	113.9775	AUTUMN	NONE	Y
7-Oct-13	2	1438	9	NW LANTAU	4	TMCLKL	22.3386	113.9483	AUTUMN	NONE	Y
7-Oct-13	3	1506	6	NW LANTAU	4	TMCLKL	22.3408	113.9405	AUTUMN	NONE	Y
7-Oct-13	4	1553	1	NW LANTAU	5	TMCLKL	22.3451	113.8954	AUTUMN	NONE	N
8-Oct-13	1	1644	6	NE LANTAU	3	TMCLKL	22.3459	114.0119	AUTUMN	NONE	Y
9-Oct-13	1	925	10	NE LANTAU	1	TMCLKL	22.3479	113.9882	AUTUMN	NONE	Y
9-Oct-13	2	1101	8	NE LANTAU	2	TMCLKL	22.3266	113.9974	AUTUMN	NONE	Y

Appendix III. (cont'd)

DATE	STG #	TIME	HRD SZ	AREA	BEAU	TYPE	LATITUDE	LONGITUDE	SEASON	BOAT ASSOC.	RECORDING
10-Oct-13	1	948	10	NW LANTAU	2	TMCLKL	22.3187	113.8790	AUTUMN	NONE	Y
10-Oct-13	2	1151	4	NW LANTAU	2	TMCLKL	22.3558	113.9073	AUTUMN	NONE	Y
10-Oct-13	3	1235	4	NW LANTAU	2	TMCLKL	22.3501	113.9172	AUTUMN	NONE	Y
10-Oct-13	4	1321	2	NE LANTAU	2	TMCLKL	22.3288	113.9616	AUTUMN	NONE	Y
10-Oct-13	5	1542	1	NE LANTAU	2	TMCLKL	22.3354	114.0135	AUTUMN	NONE	N
11-Oct-13	1	1231	2	NE LANTAU	2	TMCLKL	22.3375	113.9653	AUTUMN	NONE	Y
12-Oct-13	1	1029	3	NW LANTAU	2	TMCLKL	22.3807	113.9014	AUTUMN	NONE	Y
12-Oct-13	2	1238	1	NW LANTAU	2	TMCLKL	22.3416	113.9407	AUTUMN	NONE	N
12-Oct-13	3	1545	2	NE LANTAU	2	TMCLKL	22.3280	113.9847	AUTUMN	NONE	Y
13-Oct-13	1	1325	1	NE LANTAU	2	TMCLKL	22.3441	113.9927	AUTUMN	NONE	Y
14-Oct-13	1	1045	1	NE LANTAU	3	TMCLKL	22.3456	113.9757	AUTUMN	NONE	N
14-Oct-13	2	1252	4	NW LANTAU	2	TMCLKL	22.3768	113.8753	AUTUMN	NONE	Y
14-Oct-13	3	1337	4	NW LANTAU	2	TMCLKL	22.3796	113.8871	AUTUMN	NONE	Y
15-Oct-13	1	1341	8	NW LANTAU	3	TMCLKL	22.3829	113.9028	AUTUMN	NONE	Y
18-Oct-13	1	1216	13	NW LANTAU	4	TMCLKL	22.3699	113.8893	AUTUMN	PURSE SEINE	Y
18-Oct-13	2	1426	2	NW LANTAU	2	TMCLKL	22.3242	113.9149	AUTUMN	NONE	N
19-Oct-13	1	1030	9	NE LANTAU	2	TMCLKL	22.3251	113.9783	AUTUMN	NONE	Y
19-Oct-13	2	1329	2	NW LANTAU	3	TMCLKL	22.3517	113.9194	AUTUMN	NONE	N
19-Oct-13	3	1417	2	NW LANTAU	2	TMCLKL	22.3291	113.9195	AUTUMN	NONE	N
20-Oct-13	1	929	1	NE LANTAU	2	TMCLKL	22.3354	113.9998	AUTUMN	NONE	Y
20-Oct-13	2	1010	6	NE LANTAU	1	TMCLKL	22.3167	113.9778	AUTUMN	NONE	Y
20-Oct-13	3	1243	11	NW LANTAU	3	TMCLKL	22.3300	113.8991	AUTUMN	NONE	Y
21-Oct-13	1	924	1	NE LANTAU	2	TMCLKL	22.3358	113.9971	AUTUMN	NONE	Y
21-Oct-13	2	1042	3	NE LANTAU	2	TMCLKL	22.3434	113.9707	AUTUMN	NONE	Y
21-Oct-13	3	1618	1	NE LANTAU	2	TMCLKL	22.3410	113.9775	AUTUMN	NONE	Y
22-Oct-13	1	1603	5	NE LANTAU	3	TMCLKL	22.3370	113.9713	AUTUMN	NONE	Y
22-Oct-13	2	1709	5	NE LANTAU	2	TMCLKL	22.3280	113.9732	AUTUMN	NONE	Y
23-Oct-13	1	835	1	NE LANTAU	2	TMCLKL	22.3215	113.9982	AUTUMN	NONE	Y
23-Oct-13	2	1043	1	NE LANTAU	3	TMCLKL	22.3424	113.9763	AUTUMN	NONE	Y
23-Oct-13	3	1121	2	NE LANTAU	3	TMCLKL	22.3414	113.9649	AUTUMN	NONE	N

Appendix III. (cont'd)

DATE	STG #	TIME	HRD SZ	AREA	BEAU	TYPE	LATITUDE	LONGITUDE	SEASON	BOAT ASSOC.	RECORDING
24-Oct-13	1	1147	4	NW LANTAU	3	TMCLKL	22.3387	113.8652	AUTUMN	NONE	Y
24-Oct-13	2	1226	8	NW LANTAU	3	TMCLKL	22.3834	113.8876	AUTUMN	NONE	Y
24-Oct-13	3	1440	5	NW LANTAU	3	TMCLKL	22.3534	113.9081	AUTUMN	NONE	Y
24-Oct-13	4	1507	3	NW LANTAU	3	TMCLKL	22.3503	113.9111	AUTUMN	NONE	Y
25-Oct-13	1	1214	4	NW LANTAU	3	TMCLKL	22.3846	113.8867	AUTUMN	NONE	Y
25-Oct-13	2	1255	2	NW LANTAU	3	TMCLKL	22.3781	113.8889	AUTUMN	NONE	N

Appendix IV. Database for acoustic focal follow during TM-CLKL baseline period

Date	Area	Stg#	File#	Hp Depth	Water Depth	ICP Gain	Time	Latitude	Longitude	Beau	Dolphin Grp Sz
27-Sep-13	NW LANTAU	1	35	5	10.3	x10	11:08:29	22.3772	113.8932	3	6
27-Sep-13	NW LANTAU	1	36	5	21.5	x10	11:23:16	22.3849	113.8918	2	4
27-Sep-13	NW LANTAU	1	37	5	21.7	x10	11:28:18	22.3831	113.8920	2	4
27-Sep-13	NE LANTAU	2	39	5	7.4	x10	12:56:18	22.3342	113.9518	3	4
27-Sep-13	NW LANTAU	2	40	5	8.9	x10	13:10:05	22.3327	113.9441	3	5
27-Sep-13	NW LANTAU	2	41	5	7.8	x10	13:25:43	22.3327	113.9345	3	5
27-Sep-13	NW LANTAU	3	43	5	16.9	x10	13:55:25	22.3364	113.9446	2	8
27-Sep-13	NW LANTAU	3	44	5	27.8	x10	14:00:33	22.3367	113.9445	2	8
27-Sep-13	NW LANTAU	3	45	5	27.8	x10	14:04:01	22.3367	113.9442	2	8
27-Sep-13	NW LANTAU	3	46	5	8.3	x10	14:19:37	22.3375	113.9463	2	8
27-Sep-13	NW LANTAU	3	47	5	17.2	x10	14:26:51	22.3375	113.9459	2	8
28-Sep-13	NW LANTAU	1	003	5	9.8	x11	15:22:19	22.3833	113.8775	2	3
1-Oct-13	NW LANTAU	1	86	5	31.0	x10	10:32:14	22.3766	113.8934	3	9
1-Oct-13	NW LANTAU	1	87	5	29.0	x10	10:37:26	22.3748	113.8938	3	9
1-Oct-13	NW LANTAU	1	88	5	29.0	x10	10:42:51	22.3726	113.8941	3	9
1-Oct-13	NW LANTAU	1	89	5	12.2	x10	10:49:18	22.3696	113.8946	3	9
1-Oct-13	NW LANTAU	1	90	5	29.0	x10	11:24:43	22.3751	113.8908	2	4
1-Oct-13	NW LANTAU	1	92	5	18.2	x10	11:44:50	22.3817	113.8879	2	2
1-Oct-13	NE LANTAU	3	95	5	9.1	x10	14:01:22	22.3252	113.9765	1	5
1-Oct-13	NE LANTAU	3	96	5	10.2	x10	14:11:11	22.3274	113.9762	2	5
1-Oct-13	NE LANTAU	3	97	5	14.0	x10	14:16:15	22.3275	113.9772	2	5
1-Oct-13	NE LANTAU	3	98	5	10.2	x10	14:25:41	22.3275	113.9777	2	5
1-Oct-13	NE LANTAU	3	99	5	14.9	x10	14:32:40	22.3270	113.9766	2	5
1-Oct-13	NE LANTAU	3	100	5	13.0	x10	14:47:24	22.3279	113.9767	2	5
1-Oct-13	NE LANTAU	3	101	5	10.5	x10	15:04:28	22.3244	113.9843	2	5
1-Oct-13	NE LANTAU	3	102	5	11.4	x10	15:20:48	22.3204	113.9925	2	5
1-Oct-13	NE LANTAU	3	103	5	7.0	x10	15:34:07	22.3176	113.9942	2	5
2-Oct-13	NW LANTAU	1	115	5	18.8	x10	14:36:03	22.3848	113.8883	2	3
2-Oct-13	NW LANTAU	1	116	5	18.7	x10	14:51:32	22.3869	113.8925	2	5
2-Oct-13	NW LANTAU	2	117	5	20.0	x10	15:09:03	22.3808	113.9015	3	3
2-Oct-13	NW LANTAU	2	118	5	17.4	x10	15:40:11	22.3736	113.9135	3	1
5-Oct-13	NW LANTAU	1	166	5	9.8	x10	12:20:20	22.3521	113.8926	2	2
5-Oct-13	NW LANTAU	1	167	5	9.8	x10	12:38:01	22.3508	113.9002	2	3
5-Oct-13	NW LANTAU	2	168	5	12.0	x10	12:54:45	22.3595	113.9031	3	4
5-Oct-13	NW LANTAU	2	169	5	11.7	x10	13:17:33	22.3667	113.8940	2	4
5-Oct-13	NW LANTAU	2	170	5	16.9	x10	13:41:53	22.3770	113.8907	2	4
5-Oct-13	NW LANTAU	3	171	5	6.2	x10	14:29:03	22.3653	113.8717	2	4
6-Oct-13	NW LANTAU	2	172	5	10.1	x0	11:09:28	22.3538	113.8913	3	6
6-Oct-13	NW LANTAU	2	173	5	8.0	x0	11:30:44	22.3548	113.8832	4	4
6-Oct-13	NW LANTAU	3	174	5	9.4	x0	12:06:29	22.3367	113.8973	3	4
6-Oct-13	NW LANTAU	4	175	5	9.7	x0	12:19:32	22.3379	113.8928	3	6
6-Oct-13	NW LANTAU	4	177	3	5.5	x0	12:35:06	22.3394	113.8879	4	5
7-Oct-13	NE LANTAU	1	192	5	30.1	x10	12:23:30	22.3436	113.9789	3	4
7-Oct-13	NE LANTAU	1	193	5	33.6	x10	13:01:30	22.3454	113.9765	5	3
7-Oct-13	NE LANTAU	1	194	5	31.8	x10	13:07:40	22.3449	113.9787	4	3
7-Oct-13	NW LANTAU	2	197	5	9.8	x10	14:46:10	22.3397	113.9477	3	3
7-Oct-13	NW LANTAU	3	198	5	9.8	x10	15:15:55	22.3427	113.9367	4	3
8-Oct-13	NE LANTAU	1	218	5	10.5	x0	16:59:26	22.3524	114.0070	2	6
8-Oct-13	NE LANTAU	1	219	5	11.1	x0	17:09:36	22.3511	114.0024	2	3
8-Oct-13	NE LANTAU	1	220	5	32.0	x0	17:21:10	22.3482	113.9975	2	2
9-Oct-13	NE LANTAU	1	243	5	31.1	x0	9:33:10	22.3466	113.9897	2	3
9-Oct-13	NE LANTAU	1	244	5	33.7	x0	9:49:35	22.3477	113.9967	2	6
9-Oct-13	NE LANTAU	1	245	5	30.3	x0	10:09:50	22.3430	114.0015	2	6
9-Oct-13	NE LANTAU	2	247	5	9.1	x0	11:11:10	22.3332	113.9973	2	6

Appendix IV. (cont'd)

Date	Area	Stg#	File#	Hp Depth	Water Depth	ICP Gain	Time	Latitude	Longitude	Beau	Dolphin Grp Sz
10-Oct-13	NW LANTAU	1	249	5	6.6	x10	10:01:48	22.3267	113.8798	3	2
10-Oct-13	NW LANTAU	1	250	5	6.5	x10	10:16:15	22.3282	113.8838	2	3
10-Oct-13	NW LANTAU	1	251	3	4.8	x10	10:28:50	22.3370	113.8818	2	4
10-Oct-13	NW LANTAU	1	253	5	5.8	x10	10:46:10	22.3421	113.8799	2	8
10-Oct-13	NW LANTAU	1	254	5	6.8	x10	10:53:32	22.3435	113.8787	2	6
10-Oct-13	NW LANTAU	1	255	5	7.0	x10	11:04:04	22.3452	113.8787	2	3
10-Oct-13	NW LANTAU	2	256	5	13.3	x10	12:23:40	22.3563	113.9109	3	3
10-Oct-13	NE LANTAU	3	258	5	9.5	x0	13:35:34	22.3375	113.9591	2	2
10-Oct-13	NE LANTAU	4	259	5	8.4	x0	13:48:10	22.3370	113.9529	2	2
11-Oct-13	NE LANTAU	1	273	5	30.4	x10	12:45:25	22.3437	113.9765	2	2
11-Oct-13	NE LANTAU	1	274	5	28.8	x10	13:00:00	22.3443	113.9725	2	2
11-Oct-13	NE LANTAU	1	275	5	32.0	x10	13:15:37	22.3449	113.9757	2	2
11-Oct-13	NE LANTAU	1	276	5	31.5	x10	13:26:32	22.3450	113.9786	2	2
12-Oct-13	NW LANTAU	1	294	5	19.8	x0	10:45:23	22.3785	113.9046	2	3
12-Oct-13	NW LANTAU	1	295	5	20.7	x0	11:04:50	22.3724	113.9125	2	2
12-Oct-13	NW LANTAU	1	296	5	17.6	x0	11:22:16	22.3739	113.9131	2	2
12-Oct-13	NE LANTAU	3	304	5	9.6	x10	15:59:45	22.3294	113.9777	3	1
12-Oct-13	NE LANTAU	3	305	5	6.8	x10	16:05:19	22.3302	113.9760	3	1
13-Oct-13	NE LANTAU	1	311	5	32.9	x10	13:43:40	22.3460	113.9952	2	1
14-Oct-13	NW LANTAU	2	323	5	10.0	x10	13:14:28	22.3775	113.8749	2	3
14-Oct-13	NW LANTAU	2	324	5	10.0	x10/x20	13:21:07	22.3759	113.8740	1	2
14-Oct-13	NW LANTAU	3	325	5	10.1	x10	13:46:14	22.3744	113.8876	2	3
15-Oct-13	NW LANTAU	1	330	5	20.5	x10	14:22:59	22.3664	113.9123	3	1
15-Oct-13	NW LANTAU	1	331	5	17.3	x0	14:46:55	22.3735	113.9137	3	2
18-Oct-13	NW LANTAU	1	394	5	14.2	x20/x10	12:24:18	22.3714	113.8931	3	7
18-Oct-13	NW LANTAU	1	395	5	14.2	x10	12:30:50	22.3676	113.8940	3	5
18-Oct-13	NW LANTAU	1	396	5	18.1	x10	12:51:35	22.3751	113.8931	3	4
18-Oct-13	NW LANTAU	1	397	5	21.7	x10	13:05:36	22.3811	113.8923	2	8
18-Oct-13	NW LANTAU	1	398	5	20.5	x10	13:20:08	22.3856	113.8887	2	8
18-Oct-13	NW LANTAU	1	399	5	20.5	x10	13:25:19	22.3824	113.8888	2	3
18-Oct-13	NE LANTAU	2	402	3	5.5	x20/x10	14:32:09	22.3286	113.9217	2	2
19-Oct-13	NE LANTAU	1	407	5	8.2	x20/x10	10:48:40	22.3337	113.9728	3	6
19-Oct-13	NE LANTAU	1	409	5	7.8	x0	11:04:01	22.3350	113.9680	3	6
19-Oct-13	NE LANTAU	1	410	5	12.0	x0/x10	11:22:47	22.3397	113.9627	3	6
19-Oct-13	NE LANTAU	1	411	5	11.0	x10	11:36:10	22.3393	113.9582	2	6
19-Oct-13	NW LANTAU	1	412	5	14.2	x0	12:03:03	22.3429	113.9456	2	6
19-Oct-13	NW LANTAU	1	413	5	22.9	x0	12:20:50	22.3491	113.9434	2	6
19-Oct-13	NW LANTAU	1	414	5	22.3	x0	12:34:09	22.3523	113.9412	2	6
19-Oct-13	NW LANTAU	1	415	5	24.3	x0	12:50:10	22.3537	113.9362	2	6
19-Oct-13	NW LANTAU	1	416	5	21.6	x0	13:15:10	22.3578	113.9283	2	6
20-Oct-13	NE LANTAU	1	422	5	10.0	x20/x10	9:40:40	22.3302	113.9892	2	1
20-Oct-13	NE LANTAU	2	423	5	9.8	x10	10:17:55	22.3173	113.9774	1	6
20-Oct-13	NE LANTAU	2	424	5	9.7	x10	10:23:20	22.3172	113.9775	1	6
20-Oct-13	NE LANTAU	2	425	5	9.9	x10	10:28:30	22.3173	113.9778	1	6
20-Oct-13	NE LANTAU	2	426	5	11.4	x10	10:41:47	22.3192	113.9794	1	3
20-Oct-13	NE LANTAU	2	427	5	10.4	x10	10:55:11	22.3157	113.9848	1	3
20-Oct-13	NW LANTAU	3	430	5	9.7	x10	12:57:57	22.3388	113.8924	2	6
20-Oct-13	NW LANTAU	3	431	5	11.1	x10	13:14:08	22.3449	113.8949	2	5
20-Oct-13	NW LANTAU	3	432	5	9.1	x10	13:34:55	22.3511	113.8932	2	5
20-Oct-13	NW LANTAU	3	433	5	9.0	x10	13:49:15	22.3548	113.8930	3	5
21-Oct-13	NE LANTAU	1	438	5	9.8	x10	9:37:24	22.3309	113.9868	1	1
21-Oct-13	NE LANTAU	2	440	5	23.7	X10	10:57:41	22.3436	113.9660	2	3
21-Oct-13	NE LANTAU	2	441	5	11.0	x10/x0	11:11:19	22.3397	113.9549	2	3
21-Oct-13	NW LANTAU	2	442	5	28.7	x10	11:25:33	22.3398	113.9432	2	3
21-Oct-13	NE LANTAU	3	461	5	13.3	x10/x0	16:27:25	22.3419	113.9781	2	1

Appendix IV. (cont'd)

Date	Area	Stg#	File#	Hp Depth	Water Depth	ICP Gain	Time	Latitude	Longitude	Beau	Dolphin Grp Sz
22-Oct-13	NE LANTAU	1	465	3	5.5	x0	16:17:12	22.3379	113.9746	2	5
22-Oct-13	NE LANTAU	1	466	3	6.5	x0	16:47:55	22.3389	113.9742	2	3
22-Oct-13	NE LANTAU	2	467	5	8.4	x10	17:09:49	22.3280	113.9732	2	5
22-Oct-13	NE LANTAU	2	468	5	11.5	x10	17:22:22	22.3235	113.9789	2	5
22-Oct-13	NE LANTAU	2	469	5	7.5	x10	17:37:03	22.3172	113.9844	2	5
22-Oct-13	NE LANTAU	2	470	5	10.8	x10	17:54:00	22.3190	113.9897	2	4
22-Oct-13	NE LANTAU	2	473	5	10.3	x10	18:02:40	22.3183	113.9888	2	3
23-Oct-13	NE LANTAU	1	495	5	8.8	x20	8:49:12	22.3309	113.9942	3	1
23-Oct-13	NE LANTAU	2	498	5	29.7	x10	11:01:40	22.3439	113.9739	3	1
24-Oct-13	NW LANTAU	2	501	5	21.7	x20	12:35:19	22.3860	113.8951	3	3
24-Oct-13	NW LANTAU	2	502	5	17.3	x0	13:04:04	22.3861	113.9032	3	4
24-Oct-13	NW LANTAU	2	503	5	15.3	x10	13:15:37	22.3856	113.9045	3	4
24-Oct-13	NW LANTAU	2	504	5	14.3	x10	13:20:51	22.3860	113.9047	3	4
24-Oct-13	NW LANTAU	2	505	5	12.3	x10	13:26:23	22.3866	113.9054	3	4
24-Oct-13	NW LANTAU	2	506	5	11.6	x10	13:31:35	22.3872	113.9061	3	4
24-Oct-13	NW LANTAU	2	507	5	10.5	x10	13:36:55	22.3875	113.9067	3	5
24-Oct-13	NW LANTAU	2	508	5	6.8	x10	13:52:45	22.3881	113.9089	2	5
24-Oct-13	NW LANTAU	2	509	5	6.8	x10	13:58:54	22.3875	113.9099	2	5
24-Oct-13	NW LANTAU	2	510	3	4.9	x10	14:10:30	22.3862	113.9114	2	5
24-Oct-13	NW LANTAU	3	511	5	9.8	x10	14:45:12	22.3509	113.9105	2	4
24-Oct-13	NW LANTAU	4	512	5	9.9	x10	15:07:15	22.3503	113.9111	3	3
25-Oct-13	NW LANTAU	1	520	5	~18	x10	12:30:30	22.3817	113.8862	3	2
25-Oct-13	NW LANTAU	1	521	5	~18	x10	12:35:45	22.3812	113.8857	3	2

APPENDIX V. Raw data for plots.

Data for Table 1. Mean bandlevels as a function of distance from proposed bored piling pier locations for the baseline study phase.

Wideband:

	Set 1: SPL_mean [dB re 1 uPa]					
Range (m)	Pier B1	Pier B2	Pier B3	Pier B5	Pier B6	Pier B7
0	118.0	116.3	113.2	107.2	NaN	117.8
10	116.1	NaN	114.3	110.7	NaN	112.7
20	117.2	NaN	113.8	110.9	NaN	115.6
50	117.3	NaN	111.5	110.7	NaN	119.2
100	118.2	NaN	111.8	116.2	NaN	114.5
200	117.3	NaN	113.1	113.2	NaN	117.2
300	115.6	NaN	111.6	111.0	NaN	117.0
500	112.1	NaN	110.4	119.0	NaN	111.9
	Set 2: SPL_mean [dB re 1 uPa]					
Range (m)	Pier B1	Pier B2	Pier B3	Pier B5	Pier B6	Pier B7
0	107.9	112.5	114.1	111.2	117.8	117.8
10	108.2	111.8	116.7	109.0	113.7	112.7
20	108.9	114.3	116.7	108.0	118.3	115.6
50	107.8	109.8	112.7	112.0	117.6	119.2
100	116.5	125.4	110.2	109.4	116.1	114.5
200	113.2	118.8	120.9	108.5	118.1	117.2
300	120.6	120.5	112.3	108.4	118.2	117.0
500	116.1	112.4	117.6	107.1	115.2	111.9

APPENDIX V (cont'd)

Data for Table 1. (cont'd)

Dolphin Band:

	Set 1: SPL_mean [dB re uPa]					
Range (m)	Pier B1	Pier B2	Pier B3	Pier B5	Pier B6	Pier B7
0	112.8	110.9	106.2	102.8	NaN	111.1
10	113.2	NaN	108.0	105.5	NaN	108.5
20	114.8	NaN	107.7	103.3	NaN	108.2
50	115.1	NaN	103.5	104.5	NaN	116.3
100	116.2	NaN	106.1	107.8	NaN	105.8
200	115.2	NaN	105.4	103.8	NaN	108.3
300	112.3	NaN	103.7	103.3	NaN	108.0
500	108.4	NaN	103.1	110.5	NaN	105.0
	Set 2: SPL_mean [dB re uPa]					
Range (m)	Pier B1	Pier B2	Pier B3	Pier B5	Pier B6	Pier B7
0	99.8	102.7	102.7	107.0	114.6	111.1
10	104.1	104.0	109.1	106.8	109.3	108.5
20	101.0	103.4	109.4	105.1	110.8	108.2
50	103.2	101.4	105.3	108.2	113.7	116.3
100	103.8	112.2	101.5	107.7	107.1	105.8
200	106.0	115.0	119.6	107.1	109.5	108.3
300	112.1	116.8	102.6	103.7	112.8	108.0
500	107.9	103.6	105.3	103.0	110.2	105.0

APPENDIX V (cont'd)

Data for Figure 3. Mean bandlevels for all 440 recordings. Bandlevels were analyzed in terms of both the 30–40,000 Hz "wideband" frequency range (red) and 400–12,500 Hz "dolphin-sensitive" band (blue) and then averaged over the duration of each recording.

Date	Time	Mean Bandlevel (Wideband) [dB re uPa]	Mean Bandlevel (Dolphin Band) [dB re uPa]
26-Sep-13	9:20 AM	124.4	117.9
26-Sep-13	10:00 AM	111.9	105.1
26-Sep-13	10:34 AM	109.9	102.6
26-Sep-13	10:54 AM	112.5	110.3
26-Sep-13	11:52 AM	119.7	117.8
26-Sep-13	12:24 PM	119.7	116.9
26-Sep-13	12:51 PM	110.7	106.9
26-Sep-13	1:23 PM	114.7	111.9
26-Sep-13	1:55 PM	127.5	119.9
27-Sep-13	11:08 AM	113.0	111.6
27-Sep-13	11:23 AM	116.4	115.6
27-Sep-13	11:28 AM	124.4	121.8
27-Sep-13	12:19 PM	115.0	112.8
27-Sep-13	12:56 PM	120.1	114.1
27-Sep-13	1:10 PM	122.1	119.3
27-Sep-13	1:25 PM	118.2	116.9
27-Sep-13	1:50 PM	121.1	116.6
27-Sep-13	1:55 PM	126.5	121.3
27-Sep-13	2:00 PM	124.8	116.7
27-Sep-13	2:04 PM	116.1	111.6
27-Sep-13	2:19 PM	124.4	120.6
27-Sep-13	2:26 PM	126.9	124.1
27-Sep-13	3:12 PM	110.9	108.9
27-Sep-13	3:42 PM	117.7	113.7
27-Sep-13	4:16 PM	115.6	112.1
27-Sep-13	5:11 PM	115.0	106.1
28-Sep-13	9:42 AM	131.2	110.8
28-Sep-13	10:08 AM	112.7	102.9
28-Sep-13	10:40 AM	115.5	114.4
28-Sep-13	11:08 AM	114.7	112.7
28-Sep-13	11:40 AM	126.1	121.5
28-Sep-13	12:07 PM	123.8	117.3
28-Sep-13	1:26 PM	123.4	118.6
29-Sep-13	1:34 PM	122.8	119.7
29-Sep-13	3:25 PM	120.9	117.5

APPENDIX V (cont'd)

Data for Figure 3. (cont'd)

Date	Time	Mean Bandlevel (Wideband) [dB re uPa]	Mean Bandlevel (Dolphin Band) [dB re uPa]
29-Sep-13	4:01 PM	130.9	127.4
30-Sep-13	10:11 AM	130.8	126.5
30-Sep-13	10:39 AM	116.8	112.7
30-Sep-13	12:39 PM	117.1	114.2
30-Sep-13	1:09 PM	121.8	115.6
30-Sep-13	4:13 PM	113.1	104.1
1-Oct-13	10:32 AM	120.5	118.7
1-Oct-13	10:37 AM	118.1	116.7
1-Oct-13	10:42 AM	123.8	122.8
1-Oct-13	10:49 AM	118.6	116.8
1-Oct-13	11:24 AM	117.0	116.5
1-Oct-13	11:44 AM	115.5	115.2
1-Oct-13	1:09 PM	122.1	115.0
1-Oct-13	1:39 PM	118.8	111.7
1-Oct-13	2:01 PM	119.8	114.0
1-Oct-13	2:11 PM	117.2	112.8
1-Oct-13	2:16 PM	114.8	111.3
1-Oct-13	2:25 PM	112.0	107.9
1-Oct-13	2:32 PM	116.6	114.0
1-Oct-13	2:47 PM	113.7	110.7
1-Oct-13	3:04 PM	114.1	112.7
1-Oct-13	3:20 PM	120.9	115.9
1-Oct-13	3:34 PM	118.4	112.1
1-Oct-13	4:12 PM	123.5	114.9
1-Oct-13	4:21 PM	120.1	115.5
2-Oct-13	9:28 AM	118.2	110.3
2-Oct-13	10:01 AM	113.5	109.2
2-Oct-13	10:27 AM	113.3	110.7
2-Oct-13	10:59 AM	115.5	112.6
2-Oct-13	11:30 AM	125.7	116.7
2-Oct-13	11:57 AM	112.9	111.5
2-Oct-13	12:29 PM	134.2	131.2
2-Oct-13	12:58 PM	132.1	125.0
2-Oct-13	2:36 PM	118.5	117.6
2-Oct-13	2:51 PM	125.2	124.3
2-Oct-13	3:09 PM	115.9	113.7
3-Oct-13	12:33 PM	113.2	110.4

APPENDIX V (cont'd)

Data for Figure 3. (cont'd)

Date	Time	Mean Bandlevel (Wideband) [dB re uPa]	Mean Bandlevel (Dolphin Band) [dB re uPa]
3-Oct-13	1:02 PM	120.2	117.0
3-Oct-13	1:27 PM	124.4	105.7
3-Oct-13	2:47 PM	123.3	116.6
3-Oct-13	3:17 PM	127.5	121.3
3-Oct-13	3:47 PM	129.6	119.0
3-Oct-13	5:16 PM	119.5	116.0
3-Oct-13	5:51 PM	120.0	115.4
3-Oct-13	8:06 PM	118.0	112.8
3-Oct-13	8:08 PM	116.1	113.2
3-Oct-13	8:11 PM	117.2	114.8
3-Oct-13	8:20 PM	117.3	115.1
3-Oct-13	8:23 PM	118.2	116.2
3-Oct-13	8:33 PM	117.3	115.2
3-Oct-13	8:40 PM	115.6	112.3
3-Oct-13	8:45 PM	112.1	108.4
3-Oct-13	9:01 PM	116.3	110.9
3-Oct-13	9:10 PM	113.2	106.2
3-Oct-13	9:18 PM	114.3	108.0
3-Oct-13	9:34 PM	113.8	107.7
3-Oct-13	9:42 PM	111.5	103.5
3-Oct-13	9:47 PM	111.8	106.1
3-Oct-13	9:53 PM	113.1	105.4
3-Oct-13	10:00 PM	111.6	103.7
3-Oct-13	10:06 PM	110.4	103.1
4-Oct-13	9:50 AM	130.5	125.7
4-Oct-13	9:55 AM	127.8	123.3
4-Oct-13	10:05 AM	121.9	114.8
4-Oct-13	10:10 AM	132.1	127.3
4-Oct-13	11:43 AM	104.9	101.4
4-Oct-13	12:41 PM	114.4	112.7
4-Oct-13	1:12 PM	128.1	124.2
4-Oct-13	2:13 PM	119.5	114.7
4-Oct-13	2:42 PM	113.3	110.7
4-Oct-13	3:13 PM	116.9	114.7
4-Oct-13	3:41 PM	118.1	114.9
5-Oct-13	8:27 AM	107.0	101.7
5-Oct-13	8:57 AM	109.7	107.4

APPENDIX V (cont'd)

Data for Figure 3. (cont'd)

Date	Time	Mean Bandlevel (Wideband) [dB re uPa]	Mean Bandlevel (Dolphin Band) [dB re uPa]
5-Oct-13	9:30 AM	111.1	108.0
5-Oct-13	9:58 AM	119.7	116.1
5-Oct-13	10:28 AM	107.1	105.2
5-Oct-13	10:57 AM	122.9	119.4
5-Oct-13	11:27 AM	120.1	114.3
5-Oct-13	12:20 PM	106.4	105.5
5-Oct-13	12:38 PM	117.1	114.3
5-Oct-13	12:54 PM	117.1	115.3
5-Oct-13	1:17 PM	114.9	111.5
5-Oct-13	1:41 PM	111.7	110.7
5-Oct-13	2:29 PM	106.7	105.0
6-Oct-13	11:09 AM	114.7	112.2
6-Oct-13	11:30 AM	117.3	113.6
6-Oct-13	12:06 PM	113.9	110.8
6-Oct-13	12:19 PM	123.4	117.1
6-Oct-13	12:35 PM	113.3	110.3
6-Oct-13	1:29 PM	124.4	116.7
6-Oct-13	1:57 PM	115.0	113.6
6-Oct-13	2:27 PM	119.1	114.6
6-Oct-13	2:59 PM	114.3	112.4
6-Oct-13	3:28 PM	128.3	121.7
6-Oct-13	3:57 PM	118.5	111.5
6-Oct-13	4:16 PM	116.1	110.2
6-Oct-13	4:46 PM	129.6	122.3
7-Oct-13	9:32 AM	119.2	111.9
7-Oct-13	10:02 AM	112.3	108.5
7-Oct-13	10:31 AM	111.6	108.4
7-Oct-13	11:02 AM	112.3	109.8
7-Oct-13	11:33 AM	119.2	112.7
7-Oct-13	11:45 AM	115.8	111.6
7-Oct-13	12:23 PM	127.3	119.9
7-Oct-13	1:01 PM	117.0	114.1
7-Oct-13	1:07 PM	115.2	112.5
7-Oct-13	1:51 PM	121.2	115.1
7-Oct-13	2:22 PM	125.8	120.4
7-Oct-13	2:46 PM	128.5	124.4
7-Oct-13	3:15 PM	116.3	112.6

APPENDIX V (cont'd)

Data for Figure 3. (cont'd)

Date	Time	Mean Bandlevel (Wideband) [dB re uPa]	Mean Bandlevel (Dolphin Band) [dB re uPa]
8-Oct-13	12:34 PM	110.7	105.5
8-Oct-13	12:43 PM	110.9	103.3
8-Oct-13	12:54 PM	110.7	104.5
8-Oct-13	1:10 PM	116.2	107.8
8-Oct-13	1:19 PM	113.2	103.8
8-Oct-13	1:28 PM	111.0	103.3
8-Oct-13	1:42 PM	119.0	110.5
8-Oct-13	1:59 PM	115.6	108.2
8-Oct-13	2:03 PM	112.7	108.5
8-Oct-13	2:27 PM	117.8	111.1
8-Oct-13	2:39 PM	119.2	116.3
8-Oct-13	2:48 PM	114.5	105.8
8-Oct-13	3:03 PM	117.2	108.3
8-Oct-13	3:15 PM	117.0	108.0
8-Oct-13	3:23 PM	111.9	105.0
8-Oct-13	4:02 PM	116.4	113.7
8-Oct-13	4:33 PM	120.2	118.2
8-Oct-13	4:59 PM	121.9	117.2
8-Oct-13	5:09 PM	122.1	117.7
8-Oct-13	5:21 PM	120.0	117.2
8-Oct-13	6:01 PM	111.3	110.3
8-Oct-13	8:48 PM	113.9	107.7
8-Oct-13	9:16 PM	117.9	111.4
8-Oct-13	9:44 PM	111.0	107.9
8-Oct-13	10:18 PM	111.7	103.0
8-Oct-13	11:17 PM	112.9	105.8
9-Oct-13	12:16 AM	111.1	104.6
9-Oct-13	1:19 AM	112.9	107.1
9-Oct-13	2:15 AM	114.1	103.9
9-Oct-13	3:17 AM	108.5	102.0
9-Oct-13	4:18 AM	109.4	100.5
9-Oct-13	5:52 AM	107.7	100.0
9-Oct-13	6:18 AM	111.2	106.8
9-Oct-13	6:48 AM	107.6	102.1
9-Oct-13	7:32 AM	128.2	124.2
9-Oct-13	8:03 AM	116.0	112.9
9-Oct-13	8:21 AM	121.7	118.1

APPENDIX V (cont'd)

Data for Figure 3. (cont'd)

Date	Time	Mean Bandlevel (Wideband) [dB re uPa]	Mean Bandlevel (Dolphin Band) [dB re uPa]
9-Oct-13	8:41 AM	122.6	116.1
9-Oct-13	9:02 AM	116.8	114.7
9-Oct-13	9:33 AM	116.3	112.9
9-Oct-13	9:49 AM	120.2	116.2
9-Oct-13	10:09 AM	121.0	114.9
9-Oct-13	10:47 AM	111.8	110.1
9-Oct-13	11:11 AM	109.0	106.5
9-Oct-13	11:43 AM	124.6	119.3
10-Oct-13	10:01 AM	105.9	102.1
10-Oct-13	10:16 AM	125.5	123.2
10-Oct-13	10:28 AM	116.2	115.1
10-Oct-13	10:46 AM	107.7	105.9
10-Oct-13	10:53 AM	120.6	116.4
10-Oct-13	11:04 AM	112.5	110.2
10-Oct-13	1:02 PM	121.8	117.5
10-Oct-13	1:35 PM	119.5	114.9
10-Oct-13	1:48 PM	118.1	113.6
10-Oct-13	2:31 PM	114.2	111.2
10-Oct-13	3:03 PM	115.1	112.8
10-Oct-13	4:16 PM	117.9	114.1
11-Oct-13	9:47 AM	123.4	120.5
11-Oct-13	10:17 AM	112.2	109.0
11-Oct-13	10:48 AM	116.7	113.1
11-Oct-13	11:20 AM	117.8	114.4
11-Oct-13	11:47 AM	118.0	113.7
11-Oct-13	12:18 PM	121.7	113.6
11-Oct-13	12:45 PM	119.2	116.4
11-Oct-13	1:00 PM	117.6	113.5
11-Oct-13	1:15 PM	120.8	117.9
11-Oct-13	1:26 PM	111.4	109.0
11-Oct-13	2:18 PM	120.2	116.1
11-Oct-13	3:12 PM	108.9	101.0
11-Oct-13	3:29 PM	108.2	104.1
11-Oct-13	3:38 PM	107.8	103.2
11-Oct-13	3:43 PM	116.5	103.8
11-Oct-13	3:49 PM	113.2	106.0
11-Oct-13	3:55 PM	120.6	112.1

APPENDIX V (cont'd)

Data for Figure 3. (cont'd)

Date	Time	Mean Bandlevel (Wideband) [dB re uPa]	Mean Bandlevel (Dolphin Band) [dB re uPa]
11-Oct-13	4:01 PM	116.1	107.9
11-Oct-13	4:12 PM	114.1	102.7
11-Oct-13	4:18 PM	116.7	109.4
11-Oct-13	4:20 PM	116.7	109.1
11-Oct-13	4:26 PM	112.7	105.3
11-Oct-13	4:32 PM	110.2	101.5
11-Oct-13	4:39 PM	120.9	119.6
11-Oct-13	4:44 PM	112.3	102.6
11-Oct-13	4:50 PM	117.6	105.3
12-Oct-13	10:45 AM	119.4	115.7
12-Oct-13	11:04 AM	125.7	123.0
12-Oct-13	11:22 AM	122.6	120.3
12-Oct-13	1:07 PM	124.2	121.3
12-Oct-13	1:37 PM	115.1	112.9
12-Oct-13	2:07 PM	116.2	114.8
12-Oct-13	2:36 PM	113.0	111.0
12-Oct-13	3:06 PM	115.3	113.6
12-Oct-13	3:27 PM	109.0	107.0
12-Oct-13	3:59 PM	116.2	112.8
12-Oct-13	4:05 PM	113.6	108.9
13-Oct-13	10:25 AM	118.9	109.7
13-Oct-13	11:49 AM	126.6	122.0
13-Oct-13	12:17 PM	124.8	120.2
13-Oct-13	12:48 PM	122.8	119.1
13-Oct-13	1:17 PM	123.8	117.6
13-Oct-13	1:43 PM	122.2	117.9
13-Oct-13	2:16 PM	119.3	116.7
13-Oct-13	2:47 PM	113.9	113.3
13-Oct-13	3:18 PM	110.9	104.1
13-Oct-13	3:49 PM	124.0	122.3
13-Oct-13	4:20 PM	114.0	109.1
14-Oct-13	9:53 AM	110.1	107.9
14-Oct-13	10:22 AM	108.4	107.2
14-Oct-13	10:59 AM	127.0	120.9
14-Oct-13	11:27 AM	141.9	138.5
14-Oct-13	11:58 AM	124.7	121.8
14-Oct-13	1:14 PM	108.4	107.4

APPENDIX V (cont'd)

Data for Figure 3. (cont'd)

Date	Time	Mean Bandlevel (Wideband) [dB re uPa]	Mean Bandlevel (Dolphin Band) [dB re uPa]
14-Oct-13	1:46 PM	118.2	118.1
14-Oct-13	3:09 PM	108.9	103.6
14-Oct-13	3:38 PM	127.7	123.0
14-Oct-13	4:09 PM	116.9	114.8
14-Oct-13	4:39 PM	121.2	118.9
15-Oct-13	2:22 PM	128.2	122.4
15-Oct-13	2:46 PM	124.8	120.8
15-Oct-13	3:06 PM	120.7	118.7
15-Oct-13	3:21 PM	112.9	111.2
15-Oct-13	3:47 PM	129.6	124.0
15-Oct-13	4:16 PM	114.9	113.5
15-Oct-13	4:47 PM	119.6	115.3
15-Oct-13	5:17 PM	117.0	115.8
15-Oct-13	7:17 PM	110.2	107.2
15-Oct-13	7:20 PM	108.0	105.1
15-Oct-13	7:22 PM	107.4	105.7
15-Oct-13	7:50 PM	109.0	106.8
15-Oct-13	7:55 PM	111.2	107.0
15-Oct-13	8:07 PM	112.0	108.2
15-Oct-13	8:19 PM	109.4	107.7
15-Oct-13	8:30 PM	108.5	107.1
15-Oct-13	8:39 PM	108.4	103.7
15-Oct-13	8:50 PM	107.1	103.0
15-Oct-13	9:08 PM	111.2	106.4
15-Oct-13	9:17 PM	112.3	105.2
15-Oct-13	9:25 PM	119.5	107.8
15-Oct-13	9:34 PM	111.4	107.0
15-Oct-13	9:43 PM	111.8	105.5
15-Oct-13	9:54 PM	112.6	108.9
15-Oct-13	10:05 PM	112.2	109.8
15-Oct-13	10:17 PM	108.0	105.1
15-Oct-13	11:09 PM	115.7	111.3
15-Oct-13	11:35 PM	103.0	100.2
16-Oct-13	12:07 AM	108.3	102.8
16-Oct-13	1:04 AM	103.9	99.4
16-Oct-13	1:59 AM	101.7	100.1
16-Oct-13	3:03 AM	102.8	101.2

APPENDIX V (cont'd)

Data for Figure 3. (cont'd)

Date	Time	Mean Bandlevel (Wideband) [dB re uPa]	Mean Bandlevel (Dolphin Band) [dB re uPa]
16-Oct-13	4:03 AM	102.4	100.9
16-Oct-13	6:03 AM	106.5	104.2
16-Oct-13	6:28 AM	110.8	106.5
16-Oct-13	6:52 AM	113.4	107.2
16-Oct-13	7:22 AM	113.6	109.5
16-Oct-13	7:43 AM	111.0	107.3
16-Oct-13	8:02 AM	114.4	112.0
16-Oct-13	8:43 AM	124.1	118.6
16-Oct-13	9:03 AM	120.2	119.2
16-Oct-13	9:32 AM	113.0	110.3
16-Oct-13	10:02 AM	118.0	114.4
16-Oct-13	10:32 AM	117.5	116.9
16-Oct-13	11:09 AM	122.9	119.1
16-Oct-13	11:25 AM	108.6	106.9
17-Oct-13	9:32 AM	112.5	109.2
17-Oct-13	10:02 AM	119.9	118.6
17-Oct-13	10:32 AM	120.5	115.8
17-Oct-13	11:02 AM	125.5	121.2
17-Oct-13	11:31 AM	111.7	109.0
17-Oct-13	12:58 PM	111.0	108.9
17-Oct-13	1:20 PM	114.5	112.6
17-Oct-13	2:04 PM	115.8	111.7
17-Oct-13	2:32 PM	110.7	107.5
17-Oct-13	3:01 PM	109.0	105.4
17-Oct-13	3:32 PM	119.0	115.9
17-Oct-13	4:03 PM	120.8	114.6
18-Oct-13	9:33 AM	116.0	114.1
18-Oct-13	10:02 AM	112.3	111.8
18-Oct-13	10:33 AM	115.9	112.0
18-Oct-13	11:03 AM	119.2	115.1
18-Oct-13	12:30 PM	120.1	116.0
18-Oct-13	12:51 PM	117.4	114.2
18-Oct-13	1:05 PM	116.3	114.5
18-Oct-13	1:20 PM	115.9	114.7
18-Oct-13	1:25 PM	114.7	114.4
18-Oct-13	3:24 PM	124.1	108.6
18-Oct-13	3:56 PM	111.3	105.0

APPENDIX V (cont'd)

Data for Figure 3. (cont'd)

Date	Time	Mean Bandlevel (Wideband) [dB re uPa]	Mean Bandlevel (Dolphin Band) [dB re uPa]
18-Oct-13	4:22 PM	121.6	116.9
19-Oct-13	10:22 AM	107.8	105.1
19-Oct-13	11:04 AM	118.5	115.8
19-Oct-13	11:36 AM	124.8	117.6
19-Oct-13	12:03 PM	132.9	129.0
19-Oct-13	12:20 PM	122.9	118.1
19-Oct-13	12:34 PM	130.1	121.1
19-Oct-13	12:50 PM	124.0	120.6
19-Oct-13	1:15 PM	129.6	125.0
19-Oct-13	2:07 PM	111.8	110.3
19-Oct-13	2:25 PM	116.4	113.0
19-Oct-13	2:36 PM	115.1	113.8
19-Oct-13	3:26 PM	115.1	103.6
19-Oct-13	4:20 PM	119.0	116.3
20-Oct-13	10:17 AM	112.3	106.4
20-Oct-13	10:23 AM	108.7	105.7
20-Oct-13	10:28 AM	109.8	106.1
20-Oct-13	10:41 AM	120.9	115.4
20-Oct-13	10:55 AM	116.1	112.0
20-Oct-13	11:59 AM	117.4	114.1
20-Oct-13	12:23 PM	107.0	106.0
20-Oct-13	12:57 PM	112.2	110.3
20-Oct-13	1:14 PM	112.6	110.3
20-Oct-13	1:34 PM	108.9	106.9
20-Oct-13	1:49 PM	111.1	110.1
20-Oct-13	2:21 PM	105.5	104.2
20-Oct-13	2:37 PM	123.7	120.0
20-Oct-13	3:22 PM	124.5	118.4
20-Oct-13	4:09 PM	113.9	111.8
21-Oct-13	9:37 AM	111.4	110.8
21-Oct-13	10:17 AM	114.9	112.0
21-Oct-13	10:57 AM	118.2	112.0
21-Oct-13	11:25 AM	124.5	113.5
21-Oct-13	12:03 PM	112.5	102.7
21-Oct-13	12:11 PM	111.8	104.0
21-Oct-13	12:14 PM	114.3	103.4
21-Oct-13	12:22 PM	109.8	101.4

APPENDIX V (cont'd)

Data for Figure 3. (cont'd)

Date	Time	Mean Bandlevel (Wideband) [dB re uPa]	Mean Bandlevel (Dolphin Band) [dB re uPa]
21-Oct-13	12:28 PM	125.4	112.2
21-Oct-13	12:37 PM	118.8	115.0
21-Oct-13	12:45 PM	120.5	116.8
21-Oct-13	12:54 PM	112.4	103.6
21-Oct-13	1:13 PM	113.7	109.3
21-Oct-13	1:20 PM	118.3	110.8
21-Oct-13	1:27 PM	117.8	114.6
21-Oct-13	1:33 PM	117.6	113.7
21-Oct-13	1:41 PM	115.8	103.1
21-Oct-13	1:45 PM	116.1	107.1
21-Oct-13	1:54 PM	118.1	109.5
21-Oct-13	2:03 PM	118.2	112.8
21-Oct-13	2:11 PM	115.2	110.2
21-Oct-13	3:22 PM	108.9	105.3
22-Oct-13	12:59 PM	117.8	112.4
22-Oct-13	1:37 PM	135.3	131.9
22-Oct-13	2:24 PM	121.7	114.1
22-Oct-13	4:17 PM	118.1	116.3
22-Oct-13	4:47 PM	117.7	113.4
22-Oct-13	5:09 PM	126.8	121.3
22-Oct-13	5:22 PM	121.9	117.4
22-Oct-13	5:37 PM	114.4	110.9
22-Oct-13	5:54 PM	109.9	107.4
22-Oct-13	6:02 PM	111.6	106.0
22-Oct-13	7:05 PM	111.9	109.2
22-Oct-13	8:14 PM	110.7	108.7
22-Oct-13	8:48 PM	109.8	105.8
22-Oct-13	9:16 PM	110.2	104.5
22-Oct-13	9:50 PM	112.3	107.0
22-Oct-13	10:15 PM	106.1	102.9
22-Oct-13	10:47 PM	110.0	106.0
22-Oct-13	11:20 PM	108.3	103.4
22-Oct-13	11:52 PM	107.1	103.5
23-Oct-13	12:48 AM	111.6	104.5
23-Oct-13	1:46 AM	109.4	104.6
23-Oct-13	2:49 AM	106.5	101.7
23-Oct-13	3:45 AM	105.5	104.7

APPENDIX V (cont'd)

Data for Figure 3. (cont'd)

Date	Time	Mean Bandlevel (Wideband) [dB re uPa]	Mean Bandlevel (Dolphin Band) [dB re uPa]
23-Oct-13	4:46 AM	104.4	101.2
23-Oct-13	5:48 AM	108.8	100.7
23-Oct-13	6:17 AM	111.1	97.5
23-Oct-13	6:45 AM	111.9	103.0
23-Oct-13	7:21 AM	108.2	106.0
23-Oct-13	7:57 AM	113.6	109.6
23-Oct-13	8:18 AM	110.6	106.2
23-Oct-13	8:49 AM	115.4	111.3
23-Oct-13	9:32 AM	111.4	109.8
23-Oct-13	11:01 AM	120.6	115.0
24-Oct-13	9:48 AM	112.7	111.6
24-Oct-13	10:32 AM	126.1	118.9
24-Oct-13	12:35 PM	120.7	117.2
24-Oct-13	1:04 PM	133.6	128.8
24-Oct-13	1:15 PM	124.1	119.0
24-Oct-13	1:20 PM	128.9	122.9
24-Oct-13	1:26 PM	117.3	113.1
24-Oct-13	1:31 PM	125.4	121.4
24-Oct-13	1:36 PM	127.9	119.8
24-Oct-13	1:52 PM	120.8	115.5
24-Oct-13	1:58 PM	126.1	123.5
24-Oct-13	2:10 PM	119.2	113.4
24-Oct-13	2:45 PM	120.8	118.3
24-Oct-13	3:07 PM	116.0	114.5
24-Oct-13	3:28 PM	110.5	108.7
24-Oct-13	1:36 PM	112.7	111.1
24-Oct-13	4:32 PM	114.5	113.4
25-Oct-13	10:10 AM	116.2	111.9
25-Oct-13	10:50 AM	121.5	118.4
25-Oct-13	11:29 AM	123.4	122.1
25-Oct-13	12:30 PM	116.2	114.9
25-Oct-13	12:35 PM	116.0	115.0
25-Oct-13	1:40 PM	118.6	116.6
25-Oct-13	2:47 PM	120.5	118.0
25-Oct-13	3:33 PM	115.4	110.5

APPENDIX V (cont'd)

Data for Figure 4. Received sound levels in relation to wind speed: wind speeds measured during each recording (top plot), mean bandlevels for each recording (middle plot), and mean bandlevels as a function of wind speed (bottom plot).

Date	Time	Wind Speed [m/s]	Bandlevel (Wideband) [dB re uPa]
26-Sep-13	9:20 AM	2.1	124.4
26-Sep-13	10:00 AM	0.3	111.9
26-Sep-13	10:34 AM	2.5	109.9
26-Sep-13	10:54 AM	2.1	112.5
26-Sep-13	11:52 AM	0.3	119.7
26-Sep-13	12:24 PM	1.4	119.7
26-Sep-13	12:51 PM	0.3	110.7
26-Sep-13	1:23 PM	2.0	114.7
26-Sep-13	1:55 PM	2.4	127.5
27-Sep-13	11:08 AM	2.2	113.0
27-Sep-13	11:23 AM	3.3	116.4
27-Sep-13	11:28 AM	1.2	124.4
27-Sep-13	12:19 PM	1.8	115.0
27-Sep-13	12:56 PM	0.8	120.1
27-Sep-13	1:10 PM	3.3	122.1
27-Sep-13	1:25 PM	0.6	118.2
27-Sep-13	1:50 PM	1.6	121.1
27-Sep-13	1:55 PM	0.6	126.5
27-Sep-13	2:00 PM	0.6	124.8
27-Sep-13	2:04 PM	1.2	116.1
27-Sep-13	2:19 PM	1.2	124.4
27-Sep-13	2:26 PM	0.7	126.9
27-Sep-13	3:12 PM	3.7	110.9
27-Sep-13	3:42 PM	2.5	117.7
27-Sep-13	4:16 PM	1.3	115.6
27-Sep-13	5:11 PM	1.1	115.0
28-Sep-13	9:42 AM	1.8	131.2
28-Sep-13	10:08 AM	3.6	112.7
28-Sep-13	10:40 AM	4.1	115.5
28-Sep-13	11:08 AM	4.3	114.7
28-Sep-13	11:40 AM	4.0	126.1
28-Sep-13	12:07 PM	NaN	123.8
28-Sep-13	1:26 PM	2.9	123.4
29-Sep-13	1:34 PM	3.8	122.8
29-Sep-13	3:25 PM	1.4	120.9

APPENDIX V (cont'd)

Data for Figure 4. (cont'd)

Date	Time	Wind Speed [m/s]	Bandlevel (Wideband) [dB re uPa]
29-Sep-13	4:01 PM	0.6	130.9
30-Sep-13	10:11 AM	2.2	130.8
30-Sep-13	10:39 AM	3.5	116.8
30-Sep-13	12:39 PM	1.2	117.1
30-Sep-13	1:09 PM	3.2	121.8
30-Sep-13	4:13 PM	0.9	113.1
1-Oct-13	10:32 AM	1.8	120.5
1-Oct-13	10:37 AM	3.5	118.1
1-Oct-13	10:42 AM	1.6	123.8
1-Oct-13	10:49 AM	1.7	118.6
1-Oct-13	11:24 AM	1.3	117.0
1-Oct-13	11:44 AM	1.2	115.5
1-Oct-13	1:09 PM	1.7	122.1
1-Oct-13	1:39 PM	1.2	118.8
1-Oct-13	2:01 PM	2.2	119.8
1-Oct-13	2:11 PM	1.2	117.2
1-Oct-13	2:16 PM	1.2	114.8
1-Oct-13	2:25 PM	0.7	112.0
1-Oct-13	2:32 PM	1.4	116.6
1-Oct-13	2:47 PM	1.5	113.7
1-Oct-13	3:04 PM	2.1	114.1
1-Oct-13	3:20 PM	2.7	120.9
1-Oct-13	3:34 PM	2.5	118.4
1-Oct-13	4:12 PM	1.1	123.5
1-Oct-13	4:21 PM	2.5	120.1
2-Oct-13	9:28 AM	1.1	118.2
2-Oct-13	10:01 AM	1.5	113.5
2-Oct-13	10:27 AM	2.7	113.3
2-Oct-13	10:59 AM	2.7	115.5
2-Oct-13	11:30 AM	2.8	125.7
2-Oct-13	11:57 AM	0.6	112.9
2-Oct-13	12:29 PM	1.4	134.2
2-Oct-13	12:58 PM	1.2	132.1
2-Oct-13	2:36 PM	1.4	118.5
2-Oct-13	2:51 PM	2.9	125.2
2-Oct-13	3:09 PM	3.7	115.9
3-Oct-13	12:33 PM	0.6	113.2

APPENDIX V (cont'd)

Data for Figure 4. (cont'd)

Date	Time	Wind Speed [m/s]	Bandlevel (Wideband) [dB re uPa]
3-Oct-13	1:02 PM	0.6	120.2
3-Oct-13	1:27 PM	2.5	124.4
3-Oct-13	2:47 PM	2.8	123.3
3-Oct-13	3:17 PM	3.7	127.5
3-Oct-13	3:47 PM	1.5	129.6
3-Oct-13	5:16 PM	2.8	119.5
3-Oct-13	5:51 PM	2.2	120.0
3-Oct-13	8:06 PM	3.0	118.0
3-Oct-13	8:08 PM	3.1	116.1
3-Oct-13	8:11 PM	3.9	117.2
3-Oct-13	8:20 PM	4.2	117.3
3-Oct-13	8:23 PM	4.4	118.2
3-Oct-13	8:33 PM	5.8	117.3
3-Oct-13	8:40 PM	4.7	115.6
3-Oct-13	8:45 PM	3.6	112.1
3-Oct-13	9:01 PM	4.6	116.3
3-Oct-13	9:10 PM	4.5	113.2
3-Oct-13	9:18 PM	4.7	114.3
3-Oct-13	9:34 PM	4.3	113.8
3-Oct-13	9:42 PM	4.5	111.5
3-Oct-13	9:47 PM	4.1	111.8
3-Oct-13	9:53 PM	4.8	113.1
3-Oct-13	10:00 PM	3.6	111.6
3-Oct-13	10:06 PM	3.8	110.4
4-Oct-13	9:50 AM	2.9	130.5
4-Oct-13	9:55 AM	2.9	127.8
4-Oct-13	10:05 AM	1.7	121.9
4-Oct-13	10:10 AM	2.4	132.1
4-Oct-13	11:43 AM	1.1	104.9
4-Oct-13	12:41 PM	1.1	114.4
4-Oct-13	1:12 PM	1.3	128.1
4-Oct-13	2:13 PM	2.6	119.5
4-Oct-13	2:42 PM	2.0	113.3
4-Oct-13	3:13 PM	1.4	116.9
4-Oct-13	3:41 PM	3.6	118.1
5-Oct-13	8:27 AM	1.6	107.0
5-Oct-13	8:57 AM	1.3	109.7

APPENDIX V (cont'd)

Data for Figure 4. (cont'd)

Date	Time	Wind Speed [m/s]	Bandlevel (Wideband) [dB re uPa]
5-Oct-13	9:30 AM	1.7	111.1
5-Oct-13	9:58 AM	1.9	119.7
5-Oct-13	10:28 AM	1.3	107.1
5-Oct-13	10:57 AM	1.3	122.9
5-Oct-13	11:27 AM	2.4	120.1
5-Oct-13	12:20 PM	3.4	106.4
5-Oct-13	12:38 PM	4.1	117.1
5-Oct-13	12:54 PM	3.0	117.1
5-Oct-13	1:17 PM	3.4	114.9
5-Oct-13	1:41 PM	3.1	111.7
5-Oct-13	2:29 PM	3.0	106.7
6-Oct-13	11:09 AM	3.4	114.7
6-Oct-13	11:30 AM	5.1	117.3
6-Oct-13	12:06 PM	1.8	113.9
6-Oct-13	12:19 PM	2.1	123.4
6-Oct-13	12:35 PM	5.2	113.3
6-Oct-13	1:29 PM	1.6	124.4
6-Oct-13	1:57 PM	1.8	115.0
6-Oct-13	2:27 PM	2.7	119.1
6-Oct-13	2:59 PM	3.0	114.3
6-Oct-13	3:28 PM	3.5	128.3
6-Oct-13	3:57 PM	5.0	118.5
6-Oct-13	4:16 PM	4.5	116.1
6-Oct-13	4:46 PM	4.8	129.6
7-Oct-13	9:32 AM	5.0	119.2
7-Oct-13	10:02 AM	5.8	112.3
7-Oct-13	10:31 AM	5.6	111.6
7-Oct-13	11:02 AM	5.9	112.3
7-Oct-13	11:33 AM	7.1	119.2
7-Oct-13	11:45 AM	7.7	115.8
7-Oct-13	12:23 PM	3.8	127.3
7-Oct-13	1:01 PM	4.8	117.0
7-Oct-13	1:07 PM	4.9	115.2
7-Oct-13	1:51 PM	6.3	121.2
7-Oct-13	2:22 PM	5.9	125.8
7-Oct-13	2:46 PM	5.5	128.5
7-Oct-13	3:15 PM	3.5	116.3

APPENDIX V (cont'd)

Data for Figure 4. (cont'd)

Date	Time	Wind Speed [m/s]	Bandlevel (Wideband) [dB re uPa]
8-Oct-13	12:34 PM	4.6	110.7
8-Oct-13	12:43 PM	5.0	110.9
8-Oct-13	12:54 PM	2.0	110.7
8-Oct-13	1:10 PM	3.4	116.2
8-Oct-13	1:19 PM	3.5	113.2
8-Oct-13	1:28 PM	3.9	111.0
8-Oct-13	1:42 PM	5.1	119.0
8-Oct-13	1:59 PM	3.0	115.6
8-Oct-13	2:03 PM	3.8	112.7
8-Oct-13	2:27 PM	3.9	117.8
8-Oct-13	2:39 PM	3.7	119.2
8-Oct-13	2:48 PM	2.7	114.5
8-Oct-13	3:03 PM	2.7	117.2
8-Oct-13	3:15 PM	3.4	117.0
8-Oct-13	3:23 PM	3.3	111.9
8-Oct-13	4:02 PM	3.2	116.4
8-Oct-13	4:33 PM	2.4	120.2
8-Oct-13	4:59 PM	2.1	121.9
8-Oct-13	5:09 PM	3.1	122.1
8-Oct-13	5:21 PM	1.5	120.0
8-Oct-13	6:01 PM	3.6	111.3
8-Oct-13	8:48 PM	1.3	113.9
8-Oct-13	9:16 PM	1.8	117.9
8-Oct-13	9:44 PM	1.8	111.0
8-Oct-13	10:18 PM	1.0	111.7
8-Oct-13	11:17 PM	2.4	112.9
9-Oct-13	12:16 AM	2.9	111.1
9-Oct-13	1:19 AM	2.6	112.9
9-Oct-13	2:15 AM	1.1	114.1
9-Oct-13	3:17 AM	1.1	108.5
9-Oct-13	4:18 AM	1.9	109.4
9-Oct-13	5:52 AM	2.7	107.7
9-Oct-13	6:18 AM	0.8	111.2
9-Oct-13	6:48 AM	1.4	107.6
9-Oct-13	7:32 AM	0.6	128.2
9-Oct-13	8:03 AM	1.0	116.0
9-Oct-13	8:21 AM	0.3	121.7

APPENDIX V (cont'd)

Data for Figure 4. (cont'd)

Date	Time	Wind Speed [m/s]	Bandlevel (Wideband) [dB re uPa]
9-Oct-13	8:41 AM	0.7	122.6
9-Oct-13	9:02 AM	1.7	116.8
9-Oct-13	9:33 AM	2.0	116.3
9-Oct-13	9:49 AM	1.1	120.2
9-Oct-13	10:09 AM	1.3	121.0
9-Oct-13	10:47 AM	0.8	111.8
9-Oct-13	11:11 AM	1.4	109.0
9-Oct-13	11:43 AM	4.1	124.6
10-Oct-13	10:01 AM	3.0	105.9
10-Oct-13	10:16 AM	2.8	125.5
10-Oct-13	10:28 AM	3.3	116.2
10-Oct-13	10:46 AM	1.8	107.7
10-Oct-13	10:53 AM	2.4	120.6
10-Oct-13	11:04 AM	2.9	112.5
10-Oct-13	1:02 PM	1.7	121.8
10-Oct-13	1:35 PM	1.6	119.5
10-Oct-13	1:48 PM	0.3	118.1
10-Oct-13	2:31 PM	1.6	114.2
10-Oct-13	3:03 PM	2.8	115.1
10-Oct-13	4:16 PM	1.6	117.9
11-Oct-13	9:47 AM	0.6	123.4
11-Oct-13	10:17 AM	0.0	112.2
11-Oct-13	10:48 AM	1.1	116.7
11-Oct-13	11:20 AM	2.1	117.8
11-Oct-13	11:47 AM	1.5	118.0
11-Oct-13	12:18 PM	2.1	121.7
11-Oct-13	12:45 PM	0.4	119.2
11-Oct-13	1:00 PM	1.3	117.6
11-Oct-13	1:15 PM	2.3	120.8
11-Oct-13	1:26 PM	3.1	111.4
11-Oct-13	2:18 PM	2.7	120.2
11-Oct-13	3:12 PM	2.5	108.9
11-Oct-13	3:29 PM	1.2	108.2
11-Oct-13	3:38 PM	2.4	107.8
11-Oct-13	3:43 PM	0.3	116.5
11-Oct-13	3:49 PM	2.3	113.2
11-Oct-13	3:55 PM	2.5	120.6

APPENDIX V (cont'd)

Data for Figure 4. (cont'd)

Date	Time	Wind Speed [m/s]	Bandlevel (Wideband) [dB re uPa]
11-Oct-13	4:01 PM	1.0	116.1
11-Oct-13	4:12 PM	1.2	114.1
11-Oct-13	4:18 PM	0.5	116.7
11-Oct-13	4:20 PM	0.6	116.7
11-Oct-13	4:26 PM	1.7	112.7
11-Oct-13	4:32 PM	1.0	110.2
11-Oct-13	4:39 PM	1.6	120.9
11-Oct-13	4:44 PM	1.2	112.3
11-Oct-13	4:50 PM	1.7	117.6
12-Oct-13	10:45 AM	4.5	119.4
12-Oct-13	11:04 AM	1.8	125.7
12-Oct-13	11:22 AM	1.3	122.6
12-Oct-13	1:07 PM	5.4	124.2
12-Oct-13	1:37 PM	4.1	115.1
12-Oct-13	2:07 PM	3.5	116.2
12-Oct-13	2:36 PM	2.3	113.0
12-Oct-13	3:06 PM	2.5	115.3
12-Oct-13	3:27 PM	2.1	109.0
12-Oct-13	3:59 PM	2.4	116.2
12-Oct-13	4:05 PM	3.2	113.6
13-Oct-13	10:25 AM	2.9	118.9
13-Oct-13	11:49 AM	2.4	126.6
13-Oct-13	12:17 PM	1.5	124.8
13-Oct-13	12:48 PM	3.3	122.8
13-Oct-13	1:17 PM	0.7	123.8
13-Oct-13	1:43 PM	1.4	122.2
13-Oct-13	2:16 PM	0.9	119.3
13-Oct-13	2:47 PM	0.4	113.9
13-Oct-13	3:18 PM	0.6	110.9
13-Oct-13	3:49 PM	0.9	124.0
13-Oct-13	4:20 PM	0.7	114.0
14-Oct-13	9:53 AM	6.0	110.1
14-Oct-13	10:22 AM	4.9	108.4
14-Oct-13	10:59 AM	4.0	127.0
14-Oct-13	11:27 AM	5.0	141.9
14-Oct-13	11:58 AM	3.0	124.7
14-Oct-13	1:14 PM	1.1	108.4

APPENDIX V (cont'd)

Data for Figure 4. (cont'd)

Date	Time	Wind Speed [m/s]	Bandlevel (Wideband) [dB re uPa]
14-Oct-13	1:46 PM	1.7	118.2
14-Oct-13	3:09 PM	1.2	108.9
14-Oct-13	3:38 PM	1.1	127.7
14-Oct-13	4:09 PM	0.6	116.9
14-Oct-13	4:39 PM	0.6	121.2
15-Oct-13	2:22 PM	4.2	128.2
15-Oct-13	2:46 PM	4.7	124.8
15-Oct-13	3:06 PM	4.0	120.7
15-Oct-13	3:21 PM	2.2	112.9
15-Oct-13	3:47 PM	4.5	129.6
15-Oct-13	4:16 PM	3.2	114.9
15-Oct-13	4:47 PM	3.5	119.6
15-Oct-13	5:17 PM	4.8	117.0
15-Oct-13	7:17 PM	3.1	110.2
15-Oct-13	7:20 PM	1.6	108.0
15-Oct-13	7:22 PM	2.6	107.4
15-Oct-13	7:50 PM	3.1	109.0
15-Oct-13	7:55 PM	2.7	111.2
15-Oct-13	8:07 PM	3.5	112.0
15-Oct-13	8:19 PM	3.4	109.4
15-Oct-13	8:30 PM	3.3	108.5
15-Oct-13	8:39 PM	2.6	108.4
15-Oct-13	8:50 PM	1.4	107.1
15-Oct-13	9:08 PM	2.7	111.2
15-Oct-13	9:17 PM	3.1	112.3
15-Oct-13	9:25 PM	3.5	119.5
15-Oct-13	9:34 PM	4.2	111.4
15-Oct-13	9:43 PM	4.1	111.8
15-Oct-13	9:54 PM	2.6	112.6
15-Oct-13	10:05 PM	3.8	112.2
15-Oct-13	10:17 PM	3.9	108.0
15-Oct-13	11:09 PM	2.9	115.7
15-Oct-13	11:35 PM	1.7	103.0
16-Oct-13	12:07 AM	2.6	108.3
16-Oct-13	1:04 AM	3.8	103.9
16-Oct-13	1:59 AM	1.6	101.7
16-Oct-13	3:03 AM	1.2	102.8

APPENDIX V (cont'd)

Data for Figure 4. (cont'd)

Date	Time	Wind Speed [m/s]	Bandlevel (Wideband) [dB re uPa]
16-Oct-13	4:03 AM	2.1	102.4
16-Oct-13	6:03 AM	2.3	106.5
16-Oct-13	6:28 AM	2.9	110.8
16-Oct-13	6:52 AM	2.8	113.4
16-Oct-13	7:22 AM	3.8	113.6
16-Oct-13	7:43 AM	4.5	111.0
16-Oct-13	8:02 AM	3.9	114.4
16-Oct-13	8:43 AM	4.3	124.1
16-Oct-13	9:03 AM	2.9	120.2
16-Oct-13	9:32 AM	4.0	113.0
16-Oct-13	10:02 AM	4.5	118.0
16-Oct-13	10:32 AM	4.2	117.5
16-Oct-13	11:09 AM	4.8	122.9
16-Oct-13	11:25 AM	2.0	108.6
17-Oct-13	9:32 AM	3.7	112.5
17-Oct-13	10:02 AM	3.0	119.9
17-Oct-13	10:32 AM	4.3	120.5
17-Oct-13	11:02 AM	5.0	125.5
17-Oct-13	11:31 AM	3.8	111.7
17-Oct-13	12:58 PM	4.0	111.0
17-Oct-13	1:20 PM	3.8	114.5
17-Oct-13	2:04 PM	2.9	115.8
17-Oct-13	2:32 PM	1.4	110.7
17-Oct-13	3:01 PM	3.3	109.0
17-Oct-13	3:32 PM	2.9	119.0
17-Oct-13	4:03 PM	3.7	120.8
18-Oct-13	9:33 AM	2.7	116.0
18-Oct-13	10:02 AM	4.1	112.3
18-Oct-13	10:33 AM	3.2	115.9
18-Oct-13	11:03 AM	5.2	119.2
18-Oct-13	12:30 PM	5.0	120.1
18-Oct-13	12:51 PM	3.6	117.4
18-Oct-13	1:05 PM	2.6	116.3
18-Oct-13	1:20 PM	2.6	115.9
18-Oct-13	1:25 PM	2.1	114.7
18-Oct-13	3:24 PM	0.4	124.1
18-Oct-13	3:56 PM	3.4	111.3

APPENDIX V (cont'd)

Data for Figure 4. (cont'd)

Date	Time	Wind Speed [m/s]	Bandlevel (Wideband) [dB re uPa]
18-Oct-13	4:22 PM	3.3	121.6
19-Oct-13	10:22 AM	1.1	107.8
19-Oct-13	11:04 AM	2.8	118.5
19-Oct-13	11:36 AM	2.8	124.8
19-Oct-13	12:03 PM	2.1	132.9
19-Oct-13	12:20 PM	0.5	122.9
19-Oct-13	12:34 PM	0.6	130.1
19-Oct-13	12:50 PM	3.2	124.0
19-Oct-13	1:15 PM	1.6	129.6
19-Oct-13	2:07 PM	4.9	111.8
19-Oct-13	2:25 PM	3.2	116.4
19-Oct-13	2:36 PM	2.7	115.1
19-Oct-13	3:26 PM	2.6	115.1
19-Oct-13	4:20 PM	0.8	119.0
20-Oct-13	10:17 AM	1.8	112.3
20-Oct-13	10:23 AM	0.6	108.7
20-Oct-13	10:28 AM	1.4	109.8
20-Oct-13	10:41 AM	0.3	120.9
20-Oct-13	10:55 AM	0.3	116.1
20-Oct-13	11:59 AM	1.3	117.4
20-Oct-13	12:23 PM	2.7	107.0
20-Oct-13	12:57 PM	2.4	112.2
20-Oct-13	1:14 PM	2.3	112.6
20-Oct-13	1:34 PM	2.7	108.9
20-Oct-13	1:49 PM	4.2	111.1
20-Oct-13	2:21 PM	4.2	105.5
20-Oct-13	2:37 PM	2.8	123.7
20-Oct-13	3:22 PM	3.4	124.5
20-Oct-13	4:09 PM	2.5	113.9
21-Oct-13	9:37 AM	0.7	111.4
21-Oct-13	10:17 AM	0.5	114.9
21-Oct-13	10:57 AM	2.2	118.2
21-Oct-13	11:25 AM	0.3	124.5
21-Oct-13	12:03 PM	1.3	112.5
21-Oct-13	12:11 PM	1.9	111.8
21-Oct-13	12:14 PM	1.0	114.3
21-Oct-13	12:22 PM	2.4	109.8

APPENDIX V (cont'd)

Data for Figure 4. (cont'd)

Date	Time	Wind Speed [m/s]	Bandlevel (Wideband) [dB re uPa]
21-Oct-13	12:28 PM	3.5	125.4
21-Oct-13	12:37 PM	2.6	118.8
21-Oct-13	12:45 PM	3.3	120.5
21-Oct-13	12:54 PM	2.9	112.4
21-Oct-13	1:13 PM	3.2	113.7
21-Oct-13	1:20 PM	3.3	118.3
21-Oct-13	1:27 PM	1.1	117.8
21-Oct-13	1:33 PM	2.6	117.6
21-Oct-13	1:41 PM	2.8	115.8
21-Oct-13	1:45 PM	2.6	116.1
21-Oct-13	1:54 PM	1.0	118.1
21-Oct-13	2:03 PM	2.1	118.2
21-Oct-13	2:11 PM	1.8	115.2
21-Oct-13	3:22 PM	2.1	108.9
22-Oct-13	12:59 PM	2.0	117.8
22-Oct-13	1:37 PM	3.7	135.3
22-Oct-13	2:24 PM	4.3	121.7
22-Oct-13	4:17 PM	5.3	118.1
22-Oct-13	4:47 PM	3.3	117.7
22-Oct-13	5:09 PM	1.7	126.8
22-Oct-13	5:22 PM	2.3	121.9
22-Oct-13	5:37 PM	3.5	114.4
22-Oct-13	5:54 PM	2.7	109.9
22-Oct-13	6:02 PM	2.6	111.6
22-Oct-13	7:05 PM	2.0	111.9
22-Oct-13	8:14 PM	1.4	110.7
22-Oct-13	8:48 PM	1.8	109.8
22-Oct-13	9:16 PM	1.7	110.2
22-Oct-13	9:50 PM	2.6	112.3
22-Oct-13	10:15 PM	1.8	106.1
22-Oct-13	10:47 PM	1.2	110.0
22-Oct-13	11:20 PM	2.1	108.3
22-Oct-13	11:52 PM	1.6	107.1
23-Oct-13	12:48 AM	0.8	111.6
23-Oct-13	1:46 AM	2.8	109.4
23-Oct-13	2:49 AM	0.9	106.5
23-Oct-13	3:45 AM	3.3	105.5

APPENDIX V (cont'd)

Data for Figure 4. (cont'd)

Date	Time	Wind Speed [m/s]	Bandlevel (Wideband) [dB re uPa]
23-Oct-13	4:46 AM	1.1	104.4
23-Oct-13	5:48 AM	1.6	108.8
23-Oct-13	6:17 AM	1.2	111.1
23-Oct-13	6:45 AM	1.2	111.9
23-Oct-13	7:21 AM	2.1	108.2
23-Oct-13	7:57 AM	3.2	113.6
23-Oct-13	8:18 AM	1.6	110.6
23-Oct-13	8:49 AM	4.7	115.4
23-Oct-13	9:32 AM	3.8	111.4
23-Oct-13	11:01 AM	4.4	120.6
24-Oct-13	9:48 AM	4.3	112.7
24-Oct-13	10:32 AM	5.7	126.1
24-Oct-13	12:35 PM	6.2	120.7
24-Oct-13	1:04 PM	3.0	133.6
24-Oct-13	1:15 PM	3.8	124.1
24-Oct-13	1:20 PM	5.6	128.9
24-Oct-13	1:26 PM	3.6	117.3
24-Oct-13	1:31 PM	3.6	125.4
24-Oct-13	1:36 PM	3.2	127.9
24-Oct-13	1:52 PM	2.0	120.8
24-Oct-13	1:58 PM	1.9	126.1
24-Oct-13	2:10 PM	2.5	119.2
24-Oct-13	2:45 PM	2.6	120.8
24-Oct-13	3:07 PM	4.0	116.0
24-Oct-13	3:28 PM	2.9	110.5
24-Oct-13	1:36 PM	4.7	112.7
24-Oct-13	4:32 PM	3.6	114.5
25-Oct-13	10:10 AM	2.3	116.2
25-Oct-13	10:50 AM	1.5	121.5
25-Oct-13	11:29 AM	3.5	123.4
25-Oct-13	12:30 PM	2.8	116.2
25-Oct-13	12:35 PM	3.8	116.0
25-Oct-13	1:40 PM	2.0	118.6
25-Oct-13	2:47 PM	4.5	120.5
25-Oct-13	3:33 PM	4.4	115.4

APPENDIX V (cont'd)

Data for Figure 5. Received sound levels in relation to tidal height: tidal heights measured throughout the study (top plot), mean bandlevels for each recording (middle plot), and mean bandlevels as a function of tidal height (bottom plot).

Date	Time	Tidal Height [m]	Bandlevel (Wideband) [dB re uPa]
26-Sep-13	9:20 AM	2.1	124.4
26-Sep-13	10:00 AM	2.0	111.9
26-Sep-13	10:34 AM	1.9	109.9
26-Sep-13	10:54 AM	1.8	112.5
26-Sep-13	11:52 AM	1.6	119.7
26-Sep-13	12:24 PM	1.5	119.7
26-Sep-13	12:51 PM	1.4	110.7
26-Sep-13	1:23 PM	1.3	114.7
26-Sep-13	1:55 PM	1.2	127.5
27-Sep-13	11:08 AM	1.9	113.0
27-Sep-13	11:23 AM	1.8	116.4
27-Sep-13	11:28 AM	1.8	124.4
27-Sep-13	12:19 PM	1.7	115.0
27-Sep-13	12:56 PM	1.6	120.1
27-Sep-13	1:10 PM	1.5	122.1
27-Sep-13	1:25 PM	1.5	118.2
27-Sep-13	1:50 PM	1.4	121.1
27-Sep-13	1:55 PM	1.4	126.5
27-Sep-13	2:00 PM	1.4	124.8
27-Sep-13	2:04 PM	1.4	116.1
27-Sep-13	2:19 PM	1.3	124.4
27-Sep-13	2:26 PM	1.3	126.9
27-Sep-13	3:12 PM	1.2	110.9
27-Sep-13	3:42 PM	1.1	117.7
27-Sep-13	4:16 PM	1.1	115.6
27-Sep-13	5:11 PM	1.0	115.0
28-Sep-13	9:42 AM	2.0	131.2
28-Sep-13	10:08 AM	2.0	112.7
28-Sep-13	10:40 AM	2.0	115.5
28-Sep-13	11:08 AM	1.9	114.7
28-Sep-13	11:40 AM	1.9	126.1
28-Sep-13	12:07 PM	1.8	123.8
28-Sep-13	1:26 PM	1.7	123.4
29-Sep-13	1:34 PM	1.9	122.8
29-Sep-13	3:25 PM	1.6	120.9

APPENDIX V (cont'd)

Data for Figure 5. (cont'd)

Date	Time	Tidal Height [m]	Bandlevel (Wideband) [dB re uPa]
29-Sep-13	4:01 PM	1.5	130.9
30-Sep-13	10:11 AM	1.9	130.8
30-Sep-13	10:39 AM	1.9	116.8
30-Sep-13	12:39 PM	2.0	117.1
30-Sep-13	1:09 PM	2.0	121.8
30-Sep-13	4:13 PM	1.6	113.1
1-Oct-13	10:32 AM	1.6	120.5
1-Oct-13	10:37 AM	1.6	118.1
1-Oct-13	10:42 AM	1.6	123.8
1-Oct-13	10:49 AM	1.7	118.6
1-Oct-13	11:24 AM	1.7	117.0
1-Oct-13	11:44 AM	1.8	115.5
1-Oct-13	1:09 PM	1.9	122.1
1-Oct-13	1:39 PM	2.0	118.8
1-Oct-13	2:01 PM	2.0	119.8
1-Oct-13	2:11 PM	2.0	117.2
1-Oct-13	2:16 PM	2.0	114.8
1-Oct-13	2:25 PM	2.0	112.0
1-Oct-13	2:32 PM	2.0	116.6
1-Oct-13	2:47 PM	2.0	113.7
1-Oct-13	3:04 PM	2.0	114.1
1-Oct-13	3:20 PM	1.9	120.9
1-Oct-13	3:34 PM	1.9	118.4
1-Oct-13	4:12 PM	1.8	123.5
1-Oct-13	4:21 PM	1.8	120.1
2-Oct-13	9:28 AM	1.3	118.2
2-Oct-13	10:01 AM	1.4	113.5
2-Oct-13	10:27 AM	1.4	113.3
2-Oct-13	10:59 AM	1.5	115.5
2-Oct-13	11:30 AM	1.6	125.7
2-Oct-13	11:57 AM	1.6	112.9
2-Oct-13	12:29 PM	1.7	134.2
2-Oct-13	12:58 PM	1.8	132.1
2-Oct-13	2:36 PM	2.0	118.5
2-Oct-13	2:51 PM	2.0	125.2
2-Oct-13	3:09 PM	2.0	115.9
3-Oct-13	12:33 PM	1.6	113.2

APPENDIX V (cont'd)

Data for Figure 5. (cont'd)

Date	Time	Tidal Height [m]	Bandlevel (Wideband) [dB re uPa]
3-Oct-13	1:02 PM	1.7	120.2
3-Oct-13	1:27 PM	1.7	124.4
3-Oct-13	2:47 PM	2.0	123.3
3-Oct-13	3:17 PM	2.0	127.5
3-Oct-13	3:47 PM	2.1	129.6
3-Oct-13	5:16 PM	1.9	119.5
3-Oct-13	5:51 PM	1.8	120.0
3-Oct-13	8:06 PM	1.2	118.0
3-Oct-13	8:08 PM	1.2	116.1
3-Oct-13	8:11 PM	1.2	117.2
3-Oct-13	8:20 PM	1.1	117.3
3-Oct-13	8:23 PM	1.1	118.2
3-Oct-13	8:33 PM	1.1	117.3
3-Oct-13	8:40 PM	1.1	115.6
3-Oct-13	8:45 PM	1.0	112.1
3-Oct-13	9:01 PM	1.0	116.3
3-Oct-13	9:10 PM	1.0	113.2
3-Oct-13	9:18 PM	0.9	114.3
3-Oct-13	9:34 PM	0.9	113.8
3-Oct-13	9:42 PM	0.9	111.5
3-Oct-13	9:47 PM	0.9	111.8
3-Oct-13	9:53 PM	0.9	113.1
3-Oct-13	10:00 PM	0.9	111.6
3-Oct-13	10:06 PM	0.9	110.4
4-Oct-13	9:50 AM	1.1	130.5
4-Oct-13	9:55 AM	1.0	127.8
4-Oct-13	10:05 AM	1.0	121.9
4-Oct-13	10:10 AM	1.0	132.1
4-Oct-13	11:43 AM	1.1	104.9
4-Oct-13	12:41 PM	1.3	114.4
4-Oct-13	1:12 PM	1.5	128.1
4-Oct-13	2:13 PM	1.7	119.5
4-Oct-13	2:42 PM	1.8	113.3
4-Oct-13	3:13 PM	1.9	116.9
4-Oct-13	3:41 PM	2.0	118.1
5-Oct-13	8:27 AM	1.3	107.0
5-Oct-13	8:57 AM	1.2	109.7

APPENDIX V (cont'd)

Data for Figure 5. (cont'd)

Date	Time	Tidal Height [m]	Bandlevel (Wideband) [dB re uPa]
5-Oct-13	9:30 AM	1.1	111.1
5-Oct-13	9:58 AM	1.0	119.7
5-Oct-13	10:28 AM	0.9	107.1
5-Oct-13	10:57 AM	0.9	122.9
5-Oct-13	11:27 AM	0.9	120.1
5-Oct-13	12:20 PM	1.0	106.4
5-Oct-13	12:38 PM	1.1	117.1
5-Oct-13	12:54 PM	1.1	117.1
5-Oct-13	1:17 PM	1.2	114.9
5-Oct-13	1:41 PM	1.3	111.7
5-Oct-13	2:29 PM	1.6	106.7
6-Oct-13	11:09 AM	0.8	114.7
6-Oct-13	11:30 AM	0.8	117.3
6-Oct-13	12:06 PM	0.8	113.9
6-Oct-13	12:19 PM	0.8	123.4
6-Oct-13	12:35 PM	0.9	113.3
6-Oct-13	1:29 PM	1.0	124.4
6-Oct-13	1:57 PM	1.1	115.0
6-Oct-13	2:27 PM	1.3	119.1
6-Oct-13	2:59 PM	1.4	114.3
6-Oct-13	3:28 PM	1.6	128.3
6-Oct-13	3:57 PM	1.7	118.5
6-Oct-13	4:16 PM	1.8	116.1
6-Oct-13	4:46 PM	1.9	129.6
7-Oct-13	9:32 AM	1.4	119.2
7-Oct-13	10:02 AM	1.2	112.3
7-Oct-13	10:31 AM	1.0	111.6
7-Oct-13	11:02 AM	0.9	112.3
7-Oct-13	11:33 AM	0.8	119.2
7-Oct-13	11:45 AM	0.8	115.8
7-Oct-13	12:23 PM	0.7	127.3
7-Oct-13	1:01 PM	0.8	117.0
7-Oct-13	1:07 PM	0.8	115.2
7-Oct-13	1:51 PM	0.9	121.2
7-Oct-13	2:22 PM	1.0	125.8
7-Oct-13	2:46 PM	1.1	128.5
7-Oct-13	3:15 PM	1.2	116.3

APPENDIX V (cont'd)

Data for Figure 5. (cont'd)

Date	Time	Tidal Height [m]	Bandlevel (Wideband) [dB re uPa]
8-Oct-13	12:34 PM	0.7	110.7
8-Oct-13	12:43 PM	0.7	110.9
8-Oct-13	12:54 PM	0.7	110.7
8-Oct-13	1:10 PM	0.7	116.2
8-Oct-13	1:19 PM	0.7	113.2
8-Oct-13	1:28 PM	0.7	111.0
8-Oct-13	1:42 PM	0.7	119.0
8-Oct-13	1:59 PM	0.7	115.6
8-Oct-13	2:03 PM	0.7	112.7
8-Oct-13	2:27 PM	0.8	117.8
8-Oct-13	2:39 PM	0.8	119.2
8-Oct-13	2:48 PM	0.8	114.5
8-Oct-13	3:03 PM	0.9	117.2
8-Oct-13	3:15 PM	0.9	117.0
8-Oct-13	3:23 PM	1.0	111.9
8-Oct-13	4:02 PM	1.1	116.4
8-Oct-13	4:33 PM	1.3	120.2
8-Oct-13	4:59 PM	1.4	121.9
8-Oct-13	5:09 PM	1.4	122.1
8-Oct-13	5:21 PM	1.5	120.0
8-Oct-13	6:01 PM	1.6	111.3
8-Oct-13	8:48 PM	1.8	113.9
8-Oct-13	9:16 PM	1.7	117.9
8-Oct-13	9:44 PM	1.6	111.0
8-Oct-13	10:18 PM	1.5	111.7
8-Oct-13	11:17 PM	1.3	112.9
9-Oct-13	12:16 AM	1.2	111.1
9-Oct-13	1:19 AM	1.2	112.9
9-Oct-13	2:15 AM	1.4	114.1
9-Oct-13	3:17 AM	1.7	108.5
9-Oct-13	4:18 AM	2.0	109.4
9-Oct-13	5:52 AM	2.4	107.7
9-Oct-13	6:18 AM	2.4	111.2
9-Oct-13	6:48 AM	2.5	107.6
9-Oct-13	7:32 AM	2.4	128.2
9-Oct-13	8:03 AM	2.3	116.0
9-Oct-13	8:21 AM	2.2	121.7

APPENDIX V (cont'd)

Data for Figure 5. (cont'd)

Date	Time	Tidal Height [m]	Bandlevel (Wideband) [dB re uPa]
9-Oct-13	8:41 AM	2.2	122.6
9-Oct-13	9:02 AM	2.1	116.8
9-Oct-13	9:33 AM	1.9	116.3
9-Oct-13	9:49 AM	1.8	120.2
9-Oct-13	10:09 AM	1.7	121.0
9-Oct-13	10:47 AM	1.4	111.8
9-Oct-13	11:11 AM	1.3	109.0
9-Oct-13	11:43 AM	1.1	124.6
10-Oct-13	10:01 AM	2.0	105.9
10-Oct-13	10:16 AM	1.9	125.5
10-Oct-13	10:28 AM	1.8	116.2
10-Oct-13	10:46 AM	1.7	107.7
10-Oct-13	10:53 AM	1.7	120.6
10-Oct-13	11:04 AM	1.6	112.5
10-Oct-13	1:02 PM	1.0	121.8
10-Oct-13	1:35 PM	0.9	119.5
10-Oct-13	1:48 PM	0.8	118.1
10-Oct-13	2:31 PM	0.7	114.2
10-Oct-13	3:03 PM	0.7	115.1
10-Oct-13	4:16 PM	0.8	117.9
11-Oct-13	9:47 AM	2.2	123.4
11-Oct-13	10:17 AM	2.1	112.2
11-Oct-13	10:48 AM	2.0	116.7
11-Oct-13	11:20 AM	1.8	117.8
11-Oct-13	11:47 AM	1.7	118.0
11-Oct-13	12:18 PM	1.5	121.7
11-Oct-13	12:45 PM	1.4	119.2
11-Oct-13	1:00 PM	1.3	117.6
11-Oct-13	1:15 PM	1.3	120.8
11-Oct-13	1:26 PM	1.2	111.4
11-Oct-13	2:18 PM	1.0	120.2
11-Oct-13	3:12 PM	0.8	108.9
11-Oct-13	3:29 PM	0.8	108.2
11-Oct-13	3:38 PM	0.8	107.8
11-Oct-13	3:43 PM	0.8	116.5
11-Oct-13	3:49 PM	0.8	113.2
11-Oct-13	3:55 PM	0.8	120.6

APPENDIX V (cont'd)

Data for Figure 5. (cont'd)

Date	Time	Tidal Height [m]	Bandlevel (Wideband) [dB re uPa]
11-Oct-13	4:01 PM	0.8	116.1
11-Oct-13	4:12 PM	0.8	114.1
11-Oct-13	4:18 PM	0.8	116.7
11-Oct-13	4:20 PM	0.8	116.7
11-Oct-13	4:26 PM	0.8	112.7
11-Oct-13	4:32 PM	0.8	110.2
11-Oct-13	4:39 PM	0.8	120.9
11-Oct-13	4:44 PM	0.8	112.3
11-Oct-13	4:50 PM	0.8	117.6
12-Oct-13	10:45 AM	2.2	119.4
12-Oct-13	11:04 AM	2.1	125.7
12-Oct-13	11:22 AM	2.0	122.6
12-Oct-13	1:07 PM	1.6	124.2
12-Oct-13	1:37 PM	1.5	115.1
12-Oct-13	2:07 PM	1.3	116.2
12-Oct-13	2:36 PM	1.2	113.0
12-Oct-13	3:06 PM	1.1	115.3
12-Oct-13	3:27 PM	1.0	109.0
12-Oct-13	3:59 PM	0.9	116.2
12-Oct-13	4:05 PM	0.9	113.6
13-Oct-13	10:25 AM	2.2	118.9
13-Oct-13	11:49 AM	2.1	126.6
13-Oct-13	12:17 PM	2.1	124.8
13-Oct-13	12:48 PM	2.0	122.8
13-Oct-13	1:17 PM	1.9	123.8
13-Oct-13	1:43 PM	1.8	122.2
13-Oct-13	2:16 PM	1.6	119.3
13-Oct-13	2:47 PM	1.5	113.9
13-Oct-13	3:18 PM	1.4	110.9
13-Oct-13	3:49 PM	1.2	124.0
13-Oct-13	4:20 PM	1.1	114.0
14-Oct-13	9:53 AM	1.9	110.1
14-Oct-13	10:22 AM	2.0	108.4
14-Oct-13	10:59 AM	2.1	127.0
14-Oct-13	11:27 AM	2.1	141.9
14-Oct-13	11:58 AM	2.1	124.7
14-Oct-13	1:14 PM	2.1	108.4

APPENDIX V (cont'd)

Data for Figure 5. (cont'd)

Date	Time	Tidal Height [m]	Bandlevel (Wideband) [dB re uPa]
14-Oct-13	1:46 PM	2.0	118.2
14-Oct-13	3:09 PM	1.7	108.9
14-Oct-13	3:38 PM	1.6	127.7
14-Oct-13	4:09 PM	1.5	116.9
14-Oct-13	4:39 PM	1.3	121.2
15-Oct-13	2:22 PM	2.1	128.2
15-Oct-13	2:46 PM	2.0	124.8
15-Oct-13	3:06 PM	2.0	120.7
15-Oct-13	3:21 PM	1.9	112.9
15-Oct-13	3:47 PM	1.8	129.6
15-Oct-13	4:16 PM	1.7	114.9
15-Oct-13	4:47 PM	1.6	119.6
15-Oct-13	5:17 PM	1.4	117.0
15-Oct-13	7:17 PM	0.9	110.2
15-Oct-13	7:20 PM	0.9	108.0
15-Oct-13	7:22 PM	0.9	107.4
15-Oct-13	7:50 PM	0.9	109.0
15-Oct-13	7:55 PM	0.8	111.2
15-Oct-13	8:07 PM	0.8	112.0
15-Oct-13	8:19 PM	0.8	109.4
15-Oct-13	8:30 PM	0.8	108.5
15-Oct-13	8:39 PM	0.8	108.4
15-Oct-13	8:50 PM	0.8	107.1
15-Oct-13	9:08 PM	0.8	111.2
15-Oct-13	9:17 PM	0.8	112.3
15-Oct-13	9:25 PM	0.8	119.5
15-Oct-13	9:34 PM	0.8	111.4
15-Oct-13	9:43 PM	0.9	111.8
15-Oct-13	9:54 PM	0.9	112.6
15-Oct-13	10:05 PM	0.9	112.2
15-Oct-13	10:17 PM	0.9	108.0
15-Oct-13	11:09 PM	1.1	115.7
15-Oct-13	11:35 PM	1.2	103.0
16-Oct-13	12:07 AM	1.3	108.3
16-Oct-13	1:04 AM	1.5	103.9
16-Oct-13	1:59 AM	1.7	101.7
16-Oct-13	3:03 AM	1.8	102.8

APPENDIX V (cont'd)

Data for Figure 5. (cont'd)

Date	Time	Tidal Height [m]	Bandlevel (Wideband) [dB re uPa]
16-Oct-13	4:03 AM	1.8	102.4
16-Oct-13	6:03 AM	1.6	106.5
16-Oct-13	6:28 AM	1.5	110.8
16-Oct-13	6:52 AM	1.4	113.4
16-Oct-13	7:22 AM	1.3	113.6
16-Oct-13	7:43 AM	1.3	111.0
16-Oct-13	8:02 AM	1.3	114.4
16-Oct-13	8:43 AM	1.2	124.1
16-Oct-13	9:03 AM	1.2	120.2
16-Oct-13	9:32 AM	1.3	113.0
16-Oct-13	10:02 AM	1.3	118.0
16-Oct-13	10:32 AM	1.4	117.5
16-Oct-13	11:09 AM	1.5	122.9
16-Oct-13	11:25 AM	1.6	108.6
17-Oct-13	9:32 AM	1.0	112.5
17-Oct-13	10:02 AM	1.1	119.9
17-Oct-13	10:32 AM	1.1	120.5
17-Oct-13	11:02 AM	1.2	125.5
17-Oct-13	11:31 AM	1.3	111.7
17-Oct-13	12:58 PM	1.6	111.0
17-Oct-13	1:20 PM	1.7	114.5
17-Oct-13	2:04 PM	1.8	115.8
17-Oct-13	2:32 PM	1.9	110.7
17-Oct-13	3:01 PM	2.0	109.0
17-Oct-13	3:32 PM	2.0	119.0
17-Oct-13	4:03 PM	2.0	120.8
18-Oct-13	9:33 AM	1.0	116.0
18-Oct-13	10:02 AM	0.9	112.3
18-Oct-13	10:33 AM	0.9	115.9
18-Oct-13	11:03 AM	0.9	119.2
18-Oct-13	12:30 PM	1.2	120.1
18-Oct-13	12:51 PM	1.2	117.4
18-Oct-13	1:05 PM	1.3	116.3
18-Oct-13	1:20 PM	1.4	115.9
18-Oct-13	1:25 PM	1.4	114.7
18-Oct-13	3:24 PM	1.9	124.1
18-Oct-13	3:56 PM	1.9	111.3

APPENDIX V (cont'd)

Data for Figure 5. (cont'd)

Date	Time	Tidal Height [m]	Bandlevel (Wideband) [dB re uPa]
18-Oct-13	4:22 PM	2.0	121.6
19-Oct-13	10:22 AM	0.8	107.8
19-Oct-13	11:04 AM	0.8	118.5
19-Oct-13	11:36 AM	0.8	124.8
19-Oct-13	12:03 PM	0.8	132.9
19-Oct-13	12:20 PM	0.9	122.9
19-Oct-13	12:34 PM	0.9	130.1
19-Oct-13	12:50 PM	1.0	124.0
19-Oct-13	1:15 PM	1.0	129.6
19-Oct-13	2:07 PM	1.3	111.8
19-Oct-13	2:25 PM	1.4	116.4
19-Oct-13	2:36 PM	1.4	115.1
19-Oct-13	3:26 PM	1.6	115.1
19-Oct-13	4:20 PM	1.8	119.0
20-Oct-13	10:17 AM	0.9	112.3
20-Oct-13	10:23 AM	0.9	108.7
20-Oct-13	10:28 AM	0.9	109.8
20-Oct-13	10:41 AM	0.8	120.9
20-Oct-13	10:55 AM	0.8	116.1
20-Oct-13	11:59 AM	0.7	117.4
20-Oct-13	12:23 PM	0.7	107.0
20-Oct-13	12:57 PM	0.8	112.2
20-Oct-13	1:14 PM	0.8	112.6
20-Oct-13	1:34 PM	0.9	108.9
20-Oct-13	1:49 PM	0.9	111.1
20-Oct-13	2:21 PM	1.1	105.5
20-Oct-13	2:37 PM	1.1	123.7
20-Oct-13	3:22 PM	1.3	124.5
20-Oct-13	4:09 PM	1.5	113.9
21-Oct-13	9:37 AM	1.4	111.4
21-Oct-13	10:17 AM	1.1	114.9
21-Oct-13	10:57 AM	0.9	118.2
21-Oct-13	11:25 AM	0.8	124.5
21-Oct-13	12:03 PM	0.7	112.5
21-Oct-13	12:11 PM	0.7	111.8
21-Oct-13	12:14 PM	0.7	114.3
21-Oct-13	12:22 PM	0.7	109.8

APPENDIX V (cont'd)

Data for Figure 5. (cont'd)

Date	Time	Tidal Height [m]	Bandlevel (Wideband) [dB re uPa]
21-Oct-13	12:28 PM	0.7	125.4
21-Oct-13	12:37 PM	0.7	118.8
21-Oct-13	12:45 PM	0.7	120.5
21-Oct-13	12:54 PM	0.7	112.4
21-Oct-13	1:13 PM	0.7	113.7
21-Oct-13	1:20 PM	0.7	118.3
21-Oct-13	1:27 PM	0.7	117.8
21-Oct-13	1:33 PM	0.7	117.6
21-Oct-13	1:41 PM	0.8	115.8
21-Oct-13	1:45 PM	0.8	116.1
21-Oct-13	1:54 PM	0.8	118.1
21-Oct-13	2:03 PM	0.8	118.2
21-Oct-13	2:11 PM	0.8	115.2
21-Oct-13	3:22 PM	1.1	108.9
22-Oct-13	12:59 PM	0.7	117.8
22-Oct-13	1:37 PM	0.7	135.3
22-Oct-13	2:24 PM	0.8	121.7
22-Oct-13	4:17 PM	1.1	118.1
22-Oct-13	4:47 PM	1.2	117.7
22-Oct-13	5:09 PM	1.3	126.8
22-Oct-13	5:22 PM	1.4	121.9
22-Oct-13	5:37 PM	1.4	114.4
22-Oct-13	5:54 PM	1.5	109.9
22-Oct-13	6:02 PM	1.5	111.6
22-Oct-13	7:05 PM	1.6	111.9
22-Oct-13	8:14 PM	1.7	110.7
22-Oct-13	8:48 PM	1.6	109.8
22-Oct-13	9:16 PM	1.6	110.2
22-Oct-13	9:50 PM	1.5	112.3
22-Oct-13	10:15 PM	1.4	106.1
22-Oct-13	10:47 PM	1.4	110.0
22-Oct-13	11:20 PM	1.3	108.3
22-Oct-13	11:52 PM	1.3	107.1
23-Oct-13	12:48 AM	1.3	111.6
23-Oct-13	1:46 AM	1.4	109.4
23-Oct-13	2:49 AM	1.7	106.5
23-Oct-13	3:45 AM	1.9	105.5

APPENDIX V (cont'd)

Data for Figure 5. (cont'd)

Date	Time	Tidal Height [m]	Bandlevel (Wideband) [dB re uPa]
23-Oct-13	4:46 AM	2.2	104.4
23-Oct-13	5:48 AM	2.3	108.8
23-Oct-13	6:17 AM	2.4	111.1
23-Oct-13	6:45 AM	2.3	111.9
23-Oct-13	7:21 AM	2.3	108.2
23-Oct-13	7:57 AM	2.2	113.6
23-Oct-13	8:18 AM	2.1	110.6
23-Oct-13	8:49 AM	2.0	115.4
23-Oct-13	9:32 AM	1.8	111.4
23-Oct-13	11:01 AM	1.3	120.6
24-Oct-13	9:48 AM	1.9	112.7
24-Oct-13	10:32 AM	1.7	126.1
24-Oct-13	12:35 PM	1.1	120.7
24-Oct-13	1:04 PM	1.0	133.6
24-Oct-13	1:15 PM	1.0	124.1
24-Oct-13	1:20 PM	1.0	128.9
24-Oct-13	1:26 PM	0.9	117.3
24-Oct-13	1:31 PM	0.9	125.4
24-Oct-13	1:36 PM	0.9	127.9
24-Oct-13	1:52 PM	0.9	120.8
24-Oct-13	1:58 PM	0.9	126.1
24-Oct-13	2:10 PM	0.8	119.2
24-Oct-13	2:45 PM	0.8	120.8
24-Oct-13	3:07 PM	0.8	116.0
24-Oct-13	3:28 PM	0.8	110.5
24-Oct-13	1:36 PM	0.9	112.7
24-Oct-13	4:32 PM	0.9	114.5
25-Oct-13	10:10 AM	1.9	116.2
25-Oct-13	10:50 AM	1.7	121.5
25-Oct-13	11:29 AM	1.6	123.4
25-Oct-13	12:30 PM	1.3	116.2
25-Oct-13	12:35 PM	1.3	116.0
25-Oct-13	1:40 PM	1.1	118.6
25-Oct-13	2:47 PM	0.9	120.5
25-Oct-13	3:33 PM	0.9	115.4

APPENDIX V (cont'd)

Data for Figure 6. Mean bandlevels for the 122 recordings containing dolphin vocalizations. Bandlevels were analyzed in terms of both the 30–40,000 Hz “wideband” frequency range (red) and 400–12,500 Hz “dolphin-sensitive” band (blue). Note that the mean bandlevel was calculated across the entire recording, regardless of the duration of detected dolphin vocalizations.

Date	Time	Mean Bandlevel (Wideband) [dB re uPa]	Mean Bandlevel (Dolphin Band) [dB re uPa]
27-Sep-13	11:08 AM	113.0	111.6
27-Sep-13	11:23 AM	116.4	115.6
27-Sep-13	11:28 AM	124.4	121.8
27-Sep-13	12:56 PM	120.1	114.1
27-Sep-13	1:10 PM	122.1	119.3
27-Sep-13	1:50 PM	121.1	116.6
27-Sep-13	1:55 PM	126.5	121.3
27-Sep-13	2:00 PM	124.8	116.7
27-Sep-13	2:04 PM	116.1	111.6
27-Sep-13	2:19 PM	124.4	120.6
27-Sep-13	2:26 PM	126.9	124.1
1-Oct-13	10:32 AM	120.5	118.7
1-Oct-13	10:37 AM	118.1	116.7
1-Oct-13	10:42 AM	123.8	122.8
1-Oct-13	10:49 AM	118.6	116.8
1-Oct-13	11:24 AM	117.0	116.5
1-Oct-13	11:44 AM	115.5	115.2
1-Oct-13	2:01 PM	119.8	114.0
1-Oct-13	2:11 PM	117.2	112.8
1-Oct-13	2:16 PM	114.8	111.3
1-Oct-13	2:25 PM	112.0	107.9
1-Oct-13	2:32 PM	116.6	114.0
1-Oct-13	2:47 PM	113.7	110.7
1-Oct-13	3:04 PM	114.1	112.7
1-Oct-13	3:20 PM	120.9	115.9
1-Oct-13	3:34 PM	118.4	112.1
2-Oct-13	2:36 PM	118.5	117.6
2-Oct-13	2:51 PM	125.2	124.3
2-Oct-13	3:09 PM	115.9	113.7
4-Oct-13	11:43 AM	104.9	101.4
5-Oct-13	12:20 PM	106.4	105.5
5-Oct-13	12:38 PM	117.1	114.3
5-Oct-13	12:54 PM	117.1	115.3

APPENDIX V (cont'd)

Data for Figure 6. (cont'd)

Date	Time	Mean Bandlevel (Wideband) [dB re uPa]	Mean Bandlevel (Dolphin Band) [dB re uPa]
5-Oct-13	1:17 PM	114.9	111.5
5-Oct-13	1:41 PM	111.7	110.7
5-Oct-13	2:29 PM	106.7	105.0
6-Oct-13	11:09 AM	114.7	112.2
6-Oct-13	11:30 AM	117.3	113.6
6-Oct-13	12:06 PM	113.9	110.8
6-Oct-13	12:19 PM	123.4	117.1
6-Oct-13	12:35 PM	113.3	110.3
7-Oct-13	12:23 PM	127.3	119.9
7-Oct-13	1:01 PM	117.0	114.1
7-Oct-13	1:07 PM	115.2	112.5
7-Oct-13	2:46 PM	128.5	124.4
7-Oct-13	3:15 PM	116.3	112.6
8-Oct-13	4:59 PM	121.9	117.2
8-Oct-13	5:09 PM	122.1	117.7
8-Oct-13	5:21 PM	120.0	117.2
9-Oct-13	9:33 AM	116.3	112.9
9-Oct-13	9:49 AM	120.2	116.2
9-Oct-13	10:09 AM	121.0	114.9
9-Oct-13	11:11 AM	109.0	106.5
10-Oct-13	10:01 AM	105.9	102.1
10-Oct-13	10:16 AM	125.5	123.2
10-Oct-13	10:28 AM	116.2	115.1
10-Oct-13	10:46 AM	107.7	105.9
10-Oct-13	10:53 AM	120.6	116.4
10-Oct-13	11:04 AM	112.5	110.2
10-Oct-13	1:35 PM	119.5	114.9
10-Oct-13	1:48 PM	118.1	113.6
11-Oct-13	12:45 PM	119.2	116.4
11-Oct-13	1:00 PM	117.6	113.5
11-Oct-13	1:15 PM	120.8	117.9
11-Oct-13	1:26 PM	111.4	109.0
12-Oct-13	10:45 AM	119.4	115.7
12-Oct-13	11:04 AM	125.7	123.0
12-Oct-13	11:22 AM	122.6	120.3
12-Oct-13	3:59 PM	116.2	112.8
12-Oct-13	4:05 PM	113.6	108.9

APPENDIX V (cont'd)

Data for Figure 6. (cont'd)

Date	Time	Mean Bandlevel (Wideband) [dB re uPa]	Mean Bandlevel (Dolphin Band) [dB re uPa]
14-Oct-13	1:14 PM	108.4	107.4
14-Oct-13	1:46 PM	118.2	118.1
15-Oct-13	2:22 PM	128.2	122.4
15-Oct-13	2:46 PM	124.8	120.8
18-Oct-13	12:30 PM	120.1	116.0
18-Oct-13	12:51 PM	117.4	114.2
18-Oct-13	1:05 PM	116.3	114.5
18-Oct-13	1:20 PM	115.9	114.7
18-Oct-13	1:25 PM	114.7	114.4
19-Oct-13	11:04 AM	118.5	115.8
19-Oct-13	11:36 AM	124.8	117.6
19-Oct-13	12:03 PM	132.9	129.0
19-Oct-13	12:20 PM	122.9	118.1
19-Oct-13	12:34 PM	130.1	121.1
19-Oct-13	12:50 PM	124.0	120.6
19-Oct-13	1:15 PM	129.6	125.0
20-Oct-13	10:17 AM	112.3	106.4
20-Oct-13	10:23 AM	108.7	105.7
20-Oct-13	10:28 AM	109.8	106.1
20-Oct-13	10:41 AM	120.9	115.4
20-Oct-13	10:55 AM	116.1	112.0
20-Oct-13	12:57 PM	112.2	110.3
20-Oct-13	1:14 PM	112.6	110.3
20-Oct-13	1:34 PM	108.9	106.9
20-Oct-13	1:49 PM	111.1	110.1
21-Oct-13	9:37 AM	111.4	110.8
21-Oct-13	10:57 AM	118.2	112.0
21-Oct-13	11:25 AM	124.5	113.5
22-Oct-13	4:17 PM	118.1	116.3
22-Oct-13	4:47 PM	117.7	113.4
22-Oct-13	5:09 PM	126.8	121.3
22-Oct-13	5:22 PM	121.9	117.4
22-Oct-13	5:37 PM	114.4	110.9
22-Oct-13	5:54 PM	109.9	107.4
22-Oct-13	6:02 PM	111.6	106.0
23-Oct-13	8:49 AM	115.4	111.3
23-Oct-13	11:01 AM	120.6	115.0

APPENDIX V (cont'd)

Data for Figure 6. (cont'd)

Date	Time	Mean Bandlevel (Wideband) [dB re uPa]	Mean Bandlevel (Dolphin Band) [dB re uPa]
24-Oct-13	1:15 PM	124.1	119.0
24-Oct-13	1:20 PM	128.9	122.9
24-Oct-13	1:26 PM	117.3	113.1
24-Oct-13	1:31 PM	125.4	121.4
24-Oct-13	1:36 PM	127.9	119.8
24-Oct-13	1:52 PM	120.8	115.5
24-Oct-13	1:58 PM	126.1	123.5
24-Oct-13	2:10 PM	119.2	113.4
24-Oct-13	2:45 PM	120.8	118.3
24-Oct-13	3:07 PM	116.0	114.5
25-Oct-13	12:30 PM	116.2	114.9
25-Oct-13	12:35 PM	116.0	115.0

APPENDIX V (cont'd)

Data for Figure 7. Mean bandlevels for recordings with documented, actively operating, industrial sound sources: fishing activity (triangles), dredging (squares), and other general industrial activity (stars) Red and blue represent the 30–40,000 Hz "wideband" frequency range and 400–12,500 Hz "dolphin-sensitive" band, respectively. Note that the mean bandlevel was calculated across the entire recording, and, thus, bandlevels may represent other concurrent sound sources.

Fish:

Date	Time	Mean Bandlevel (Wideband) [dB re uPa]	Mean Bandlevel (Dolphin Band) [dB re uPa]
27-Sep-13	1:25 PM	118.2	116.9
1-Oct-13	10:32 AM	120.5	118.7
1-Oct-13	10:37 AM	118.1	116.7
1-Oct-13	10:49 AM	118.6	116.8
1-Oct-13	2:32 PM	116.6	114.0
1-Oct-13	2:47 PM	113.7	110.7
1-Oct-13	3:04 PM	114.1	112.7
2-Oct-13	10:27 AM	113.3	110.7
5-Oct-13	9:30 AM	111.1	108.0
7-Oct-13	11:02 AM	112.3	109.8
14-Oct-13	1:14 PM	108.4	107.4
15-Oct-13	8:50 PM	107.1	103.0
21-Oct-13	10:57 AM	118.2	112.0

Dredging:

Date	Time	Mean Bandlevel (Wideband) [dB re uPa]	Mean Bandlevel (Dolphin Band) [dB re uPa]
30-Sep-13	4:13 PM	113.1	104.1
1-Oct-13	4:12 PM	123.5	114.9
1-Oct-13	4:21 PM	120.1	115.5
2-Oct-13	9:28 AM	118.2	110.3
2-Oct-13	10:01 AM	113.5	109.2
3-Oct-13	8:06 PM	118.0	112.8
3-Oct-13	8:08 PM	116.1	113.2
3-Oct-13	8:11 PM	117.2	114.8
3-Oct-13	8:20 PM	117.3	115.1
3-Oct-13	8:23 PM	118.2	116.2
3-Oct-13	8:33 PM	117.3	115.2
3-Oct-13	8:40 PM	115.6	112.3
3-Oct-13	8:45 PM	112.1	108.4

APPENDIX V (cont'd)

Data for Figure 7. (cont'd)

Dredging (cont'd):

3-Oct-13	9:01 PM	116.3	110.9
3-Oct-13	9:10 PM	113.2	106.2
3-Oct-13	9:18 PM	114.3	108.0
3-Oct-13	9:34 PM	113.8	107.7
3-Oct-13	9:42 PM	111.5	103.5
3-Oct-13	9:47 PM	111.8	106.1
3-Oct-13	9:53 PM	113.1	105.4
3-Oct-13	10:00 PM	111.6	103.7
3-Oct-13	10:06 PM	110.4	103.1
4-Oct-13	2:13 PM	119.5	114.7
5-Oct-13	8:57 AM	109.7	107.4
6-Oct-13	4:16 PM	116.1	110.2
7-Oct-13	9:32 AM	119.2	111.9
8-Oct-13	12:54 PM	110.7	104.5
8-Oct-13	1:10 PM	116.2	107.8
8-Oct-13	1:19 PM	113.2	103.8
8-Oct-13	1:28 PM	111.0	103.3
8-Oct-13	1:42 PM	119.0	110.5
8-Oct-13	1:59 PM	115.6	108.2
8-Oct-13	2:03 PM	112.7	108.5
8-Oct-13	2:27 PM	117.8	111.1
8-Oct-13	2:39 PM	119.2	116.3
8-Oct-13	8:48 PM	113.9	107.7
8-Oct-13	9:16 PM	117.9	111.4
8-Oct-13	9:44 PM	111.0	107.9
8-Oct-13	10:18 PM	111.7	103.0
8-Oct-13	11:17 PM	112.9	105.8
9-Oct-13	12:16 AM	111.1	104.6
9-Oct-13	1:19 AM	112.9	107.1
9-Oct-13	2:15 AM	114.1	103.9
9-Oct-13	3:17 AM	108.5	102.0
9-Oct-13	4:18 AM	109.4	100.5
9-Oct-13	5:52 AM	107.7	100.0
9-Oct-13	6:18 AM	111.2	106.8
11-Oct-13	9:47 AM	123.4	120.5
11-Oct-13	3:12 PM	108.9	101.0
11-Oct-13	3:29 PM	108.2	104.1
11-Oct-13	3:38 PM	107.8	103.2
11-Oct-13	3:43 PM	116.5	103.8
11-Oct-13	3:49 PM	113.2	106.0

APPENDIX V (cont'd)

Data for Figure 7. (cont'd)

Dredging (cont'd):

11-Oct-13	3:55 PM	120.6	112.1
11-Oct-13	4:01 PM	116.1	107.9
11-Oct-13	4:12 PM	114.1	102.7
11-Oct-13	4:18 PM	116.7	109.4
11-Oct-13	4:20 PM	116.7	109.1
11-Oct-13	4:26 PM	112.7	105.3
11-Oct-13	4:32 PM	110.2	101.5
11-Oct-13	4:39 PM	120.9	119.6
11-Oct-13	4:44 PM	112.3	102.6
11-Oct-13	4:50 PM	117.6	105.3
14-Oct-13	3:38 PM	127.7	123.0
21-Oct-13	12:22 PM	109.8	101.4
21-Oct-13	12:28 PM	125.4	112.2
21-Oct-13	12:54 PM	112.4	103.6
21-Oct-13	1:33 PM	117.6	113.7
21-Oct-13	1:54 PM	118.1	109.5
21-Oct-13	2:11 PM	115.2	110.2
22-Oct-13	2:24 PM	121.7	114.1
22-Oct-13	8:14 PM	110.7	108.7
22-Oct-13	8:48 PM	109.8	105.8
22-Oct-13	10:15 PM	106.1	102.9
22-Oct-13	11:20 PM	108.3	103.4
23-Oct-13	1:46 AM	109.4	104.6
23-Oct-13	2:49 AM	106.5	101.7
23-Oct-13	3:45 AM	105.5	104.7
23-Oct-13	4:46 AM	104.4	101.2

Other Industrial:

Date	Time	Mean Bandlevel (Wideband) [dB re uPa]	Mean Bandlevel (Dolphin Band) [dB re uPa]
1-Oct-13	3:34 PM	118.4	112.1
3-Oct-13	1:27 PM	124.4	105.7
14-Oct-13	11:27 AM	141.9	138.5
22-Oct-13	5:09 PM	126.8	121.3
23-Oct-13	8:18 AM	110.6	106.2

APPENDIX V (cont'd)

Data for Figure 8. Mean bandlevels for all 440 recordings as a function of time of day. Red and blue represent the 30–40,000 Hz "wideband" frequency range and 400 –12,500 Hz"dolphin-sensitive" band, respectively.

2-hr Period	Mean Bandlevel (Wideband) [dB re uPa]	Mean Bandlevel (Dolphin Band) [dB re uPa]	Number of Recordings
00:00–01:59	108.41	103.30	7
02:00–03:59	107.48	102.70	5
04:00–05:59	106.54	100.66	5
06:00–07:59	112.26	106.99	12
08:00–09:59	117.50	113.29	29
10:00–11:59	117.72	114.07	88
12:00–13:59	118.83	114.16	109
14:00–15:59	117.40	112.93	89
16:00–17:59	118.02	113.06	43
18:00–19:59	110.08	107.16	8
20:00–21:59	113.21	108.46	33
22:00–23:59	109.75	104.82	12

APPENDIX V (cont'd)

Data for Figure 9. The summed length of recordings in minutes made for each day of observational effort during the baseline acoustic monitoring in September-October 2013. The values above each column represent the number of recordings per day.

Date	Length of recording (min)	# of recordings
26-Sep	0.00	0
27-Sep	49.00	11
28-Sep	0.00	0
29-Sep	0.00	0
30-Sep	0.00	0
1-Oct	73.38	15
2-Oct	17.00	4
3-Oct	0.00	0
4-Oct	0.00	0
5-Oct	26.00	6
6-Oct	25.00	5
7-Oct	24.00	5
8-Oct	14.00	3
9-Oct	20.00	4
10-Oct	45.68	9
11-Oct	19.50	4
12-Oct	25.25	5
13-Oct	3.00	1
14-Oct	14.00	3
15-Oct	10.00	2
16-Oct	0.00	0
17-Oct	0.00	0
18-Oct	34.00	7
19-Oct	40.48	9
20-Oct	50.25	10
21-Oct	23.33	5
22-Oct	35.25	7
23-Oct	10.00	2
24-Oct	60.25	12
25-Oct	10.00	2

APPENDIX V (cont'd)

Data for Figure 10. The mean number of clicks and whistles per minute of recording detected for each day of observational effort. SD = standard deviation, W = whistles, C = clicks

Date	Whistles	SD W	Clicks	SD C
26-Sep	0.00	0.00	0.00	0.00
27-Sep	7.38	9.36	230.68	208.44
28-Sep	0.00	0.00	0.00	0.00
29-Sep	0.00	0.00	0.00	0.00
30-Sep	0.00	0.00	0.00	0.00
1-Oct	3.23	5.31	192.69	140.00
2-Oct	0.00	0.00	182.82	262.12
3-Oct	0.00	0.00	0.00	0.00
4-Oct	0.00	0.00	0.00	0.00
5-Oct	0.41	0.57	144.92	83.24
6-Oct	0.08	0.11	151.08	37.30
7-Oct	4.60	7.29	496.50	321.04
8-Oct	0.00	0.00	242.61	155.13
9-Oct	0.20	0.40	79.70	47.19
10-Oct	2.44	4.74	217.02	141.85
11-Oct	0.43	0.40	250.72	278.14
12-Oct	3.48	6.43	81.23	55.37
13-Oct	0.00	0.00	49.61	0.00
14-Oct	0.00	0.00	60.66	28.41
15-Oct	0.10	0.14	268.20	265.31
16-Oct	0.00	0.00	0.00	0.00
17-Oct	0.00	0.00	0.00	0.00
18-Oct	0.30	0.51	85.89	86.20
19-Oct	5.92	8.93	205.29	115.77
20-Oct	9.88	11.90	141.29	137.39
21-Oct	9.56	12.08	102.50	45.19
22-Oct	12.80	13.20	172.04	117.45
23-Oct	0.00	0.00	119.40	130.39
24-Oct	0.37	0.48	122.59	117.70
25-Oct	1.20	0.57	52.60	71.28

Data for figure 11. Mean number of whistles per minute and clicks per minute as a function of dolphin group size. SD = standard deviation, W = whistles, C = clicks

Group Size	Whistles	SD W	Clicks	SD C
1	2.89	5.21	169.74	194.88
2-5	3.14	6.54	161.46	160.61
6-9	5.64	9.91	207.25	157.17

APPENDIX V (cont'd)

Data for Figure 12. Mean number of whistles per minute and clicks per minute as a function of dolphin behavioural state. SD = standard deviation, W = whistles, C = clicks

Behavioral State	Whistles	SD W	Clicks	SD C
Feeding	2.71	6.67	165.09	118.49
Milling	3.83	7.63	183.73	182.09
Socializing	3.05	3.33	294.63	159.98
Traveling	4.98	8.77	119.98	81.82

Data for Figure 13. Mean number of whistles per minute and clicks per minute as a function of the time of day.

Time of observation	Whistles	SD W	Clicks	SD C
08:00-09:59	2.30	4.35	100.83	77.23
10:00-11:59	4.77	9.59	155.65	120.40
12:00-13:59	2.08	5.08	171.07	149.02
14:00-15:59	3.88	5.79	218.49	241.38
16:00-17:59	7.82	11.83	186.40	122.57
18:00-19:59	18.40	0.00	39.74	0.00

Data for Figure 14. Mean number of clicks/min and whistles/min recorded as a function of the distance to the nearest vessel.

Distance to nearest boat	Average whistles/min	SD W	Average clicks/min	SD C
0-99m	6.34	51.47	220.23	233.94
100-199m	2.10	26.52	193.56	167.60
200-299m	4.01	38.28	232.71	176.87
300-399m	2.23	17.44	155.41	152.16
400-499m	6.00	43.28	93.62	101.39
500+	3.36	34.54	165.17	146.28

Data for Figure 15. Mean number of clicks/min and whistles/min recorded as a function of the Beaufort Sea State.

Beaufort Scale	Average whistles/min	SD W	Average clicks/min	SD C
1	12.54	11.92	56.58	30.91
2	3.80	7.49	174.26	147.99
3	2.36	5.85	186.20	184.95
4	1.60	2.93	188.97	189.78
5	0.00	0.00	576.00	0.00

APPENDIX V (cont'd)

Data for Figure 17. Mean number of whistles per minute and clicks per minute recorded in each zone of the study area.

Zone	Whistles	SD W	Clicks	SDC
1	0.21	0.40	175.19	148.50
2	7.31	9.38	173.48	176.07

Data for Figure 18. Histogram of the percentage of EAR recordings with dolphin detections made at site C1 (Bridge Alignment Area) during 30 days of the deployment period.

Date	# of files	% files per day
27-Sep	0	0.00
28-Sep	1	0.35
29-Sep	0	0.00
30-Sep	0	0.00
1-Oct	3	1.04
2-Oct	1	0.35
3-Oct	1	0.35
4-Oct	1	0.35
5-Oct	13	4.51
6-Oct	11	3.82
7-Oct	13	4.51
8-Oct	6	2.08
9-Oct	6	2.08
10-Oct	7	2.43
11-Oct	11	3.82
12-Oct	9	3.13
13-Oct	10	3.47
14-Oct	2	0.69
15-Oct	5	1.74
16-Oct	8	2.78
17-Oct	5	1.74
18-Oct	7	2.43
19-Oct	7	2.43
20-Oct	6	2.08
21-Oct	1	0.35
22-Oct	1	0.35
23-Oct	0	0.00
24-Oct	1	0.35
25-Oct	2	0.69
26-Oct	1	0.35

APPENDIX V (cont'd)

Data for Figure 19. The number of dolphin encounters and the mean encounter duration recorded on the EAR at site C1 (Bridge Alignment Area).

Date	# of encounters	Average encounter duration	Std Dev
27-Sep	0	0	0
28-Sep	1	0	0
29-Sep	0	0	0
30-Sep	0	0	0
1-Oct	3	0	0
2-Oct	1	0	0
3-Oct	1	0	0
4-Oct	1	0	0
5-Oct	9	7.11	10.79
6-Oct	11	0	0
7-Oct	8	13.63	20.55
8-Oct	6	0	0
9-Oct	4	10.50	12.79
10-Oct	7	0	0
11-Oct	9	3.33	10.00
12-Oct	8	0	0
13-Oct	10	2.00	6.32
14-Oct	2	0	0
15-Oct	5	0	0
16-Oct	7	0.71	1.89
17-Oct	4	6.25	12.50
18-Oct	6	1.67	4.08
19-Oct	6	3.33	8.16
20-Oct	6	0	0
21-Oct	1	0	0
22-Oct	1	0	0
23-Oct	0	0	0
24-Oct	1	0	0
25-Oct	2	0	0
26-Oct	1	0	0

APPENDIX V (cont'd)

Data for Figure 20. Detections of dolphin signals at site C1 (Bridge Alignment Area) as a function of the hour of the day. Values are the total number of detections in each hour across the entire monitoring period (shaded cells represent nigttime period).

Hour of day	Click Detections	Whistle Detections
0	10	0
1	7	0
2	6	0
3	3	0
4	6	0
5	7	0
6	2	0
7	4	0
8	5	0
9	3	0
10	3	0
11	7	0
12	6	0
13	6	0
14	7	0
15	6	0
16	4	0
17	8	0
18	4	0
19	7	0
20	7	0
21	8	0
22	5	0
23	8	0

APPENDIX V (cont'd)

Data for Figure 22. Histogram of the percentage of EAR recordings at site C2 (Lung (Kwu Chau) with dolphin detections made during 30 days of the deployment period

Date	# Files	% files/day
27-Sep	23	7.99
28-Sep	18	6.25
29-Sep	24	8.33
30-Sep	24	8.33
1-Oct	4	1.39
2-Oct	30	10.42
3-Oct	14	4.86
4-Oct	34	11.81
5-Oct	43	14.93
6-Oct	35	12.15
7-Oct	40	13.89
8-Oct	55	19.10
9-Oct	59	20.49
10-Oct	81	28.13
11-Oct	38	13.19
12-Oct	33	11.46
13-Oct	32	11.11
14-Oct	28	9.72
15-Oct	46	15.97
16-Oct	44	15.28
17-Oct	42	14.58
18-Oct	39	13.54
19-Oct	25	8.68
20-Oct	26	9.03
21-Oct	23	7.99
22-Oct	48	16.67
23-Oct	70	24.31
24-Oct	40	13.89
25-Oct	67	23.26
26-Oct	23	7.99

APPENDIX V (cont'd)

Data for Figure 23. The number of dolphin encounters and the mean encounter duration recorded on the EAR at site C2 (near Lung Kwu Chau).

Date	# of encounters	Avg. encounter duration	Std Dev
27-Sep	6	21.67	33.57
28-Sep	7	19.00	32.58
29-Sep	11	9.00	13.83
30-Sep	7	20.29	30.10
1-Oct	3	1.67	2.89
2-Oct	7	22.00	26.23
3-Oct	7	8.00	9.38
4-Oct	10	13.50	20.69
5-Oct	8	35.75	49.87
6-Oct	9	18.22	29.11
7-Oct	10	27.40	20.76
8-Oct	11	32.18	41.80
9-Oct	10	30.50	45.07
10-Oct	11	44.27	71.78
11-Oct	9	31.67	49.25
12-Oct	7	30.57	50.26
13-Oct	6	49.83	52.50
14-Oct	8	18.50	14.80
15-Oct	10	19.90	14.61
16-Oct	13	16.23	24.00
17-Oct	9	24.56	40.68
18-Oct	11	20.82	16.32
19-Oct	8	16.13	21.72
20-Oct	10	11.60	27.97
21-Oct	9	18.22	17.06
22-Oct	8	33.63	37.79
23-Oct	9	13.78	10.91
24-Oct	8	70.25	125.90
25-Oct	10	48.70	65.32
26-Oct	6	21.67	36.62

APPENDIX V (cont'd)

Data for Figure 24. Detections of dolphin signals at site C2 (near Lung Kwu Chau) as a function of the hour of the day. Values are the total number of detections in each hour across the entire monitoring period (shaded cells represent nigttime period).

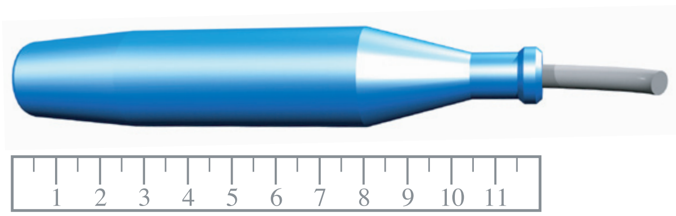
Hour of day	Click Detections	Whistle Detections
0	62	6
1	65	4
2	45	14
3	51	11
4	44	5
5	47	13
6	57	6
7	85	3
8	71	7
9	65	2
10	36	1
11	16	5
12	25	5
13	19	4
14	33	4
15	25	3
16	37	11
17	33	5
18	34	3
19	43	1
20	16	1
21	33	7
22	34	7
23	49	4

Attachment I. Specifications of dipping hydrophone (Model ITC6050C) and associated calibration record

Model ITC-6050C

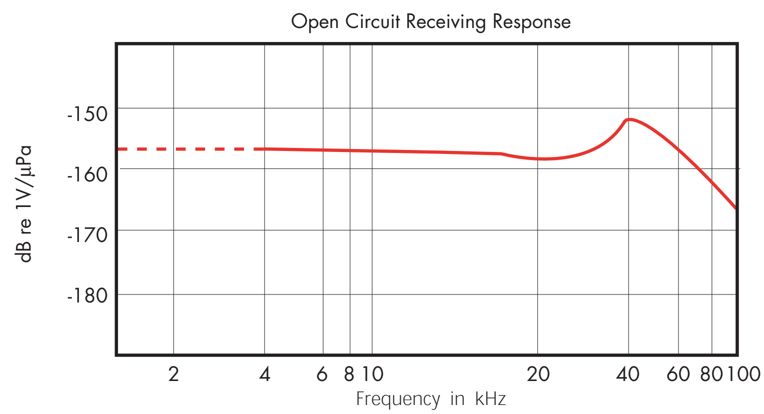
Preamplified Hydrophone

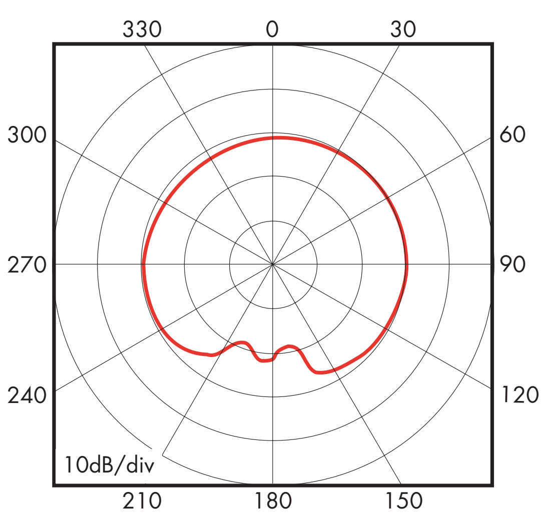
The Model ITC-6050C is a popular broadband hydrophone. The unit has a built-in, low noise preamplifier making it excellent for many field applications. Fully encapsulated in high quality polyurethane, it is well suited for rigorous conditions.



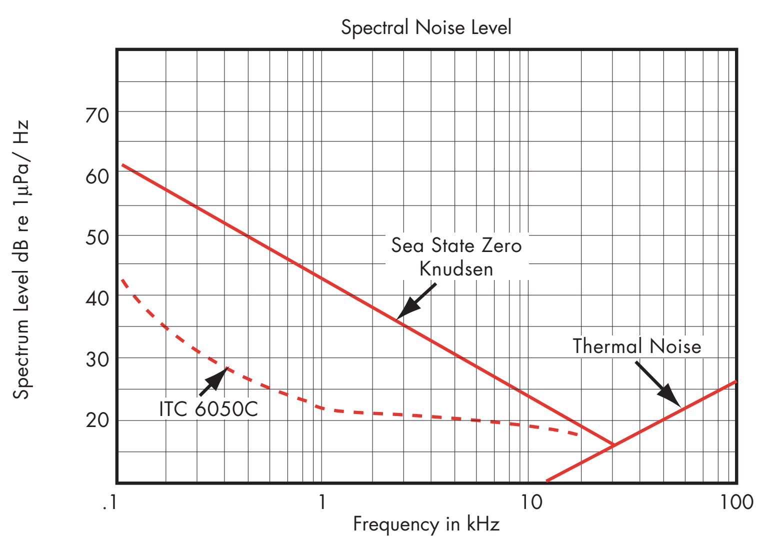
Specifications (Nominal)

Type	Hydrophone w/ Preamplifier
Resonance f_r	50 kHz
Depth	900 meters
Envelope Dimensions (in.)	2D x 12L
Midband OCV	-157 dB//1V/µPa
Suggested Band	.03 - 70 kHz
Beam Type	Spherical





Directivity Pattern at 50.0 kHz

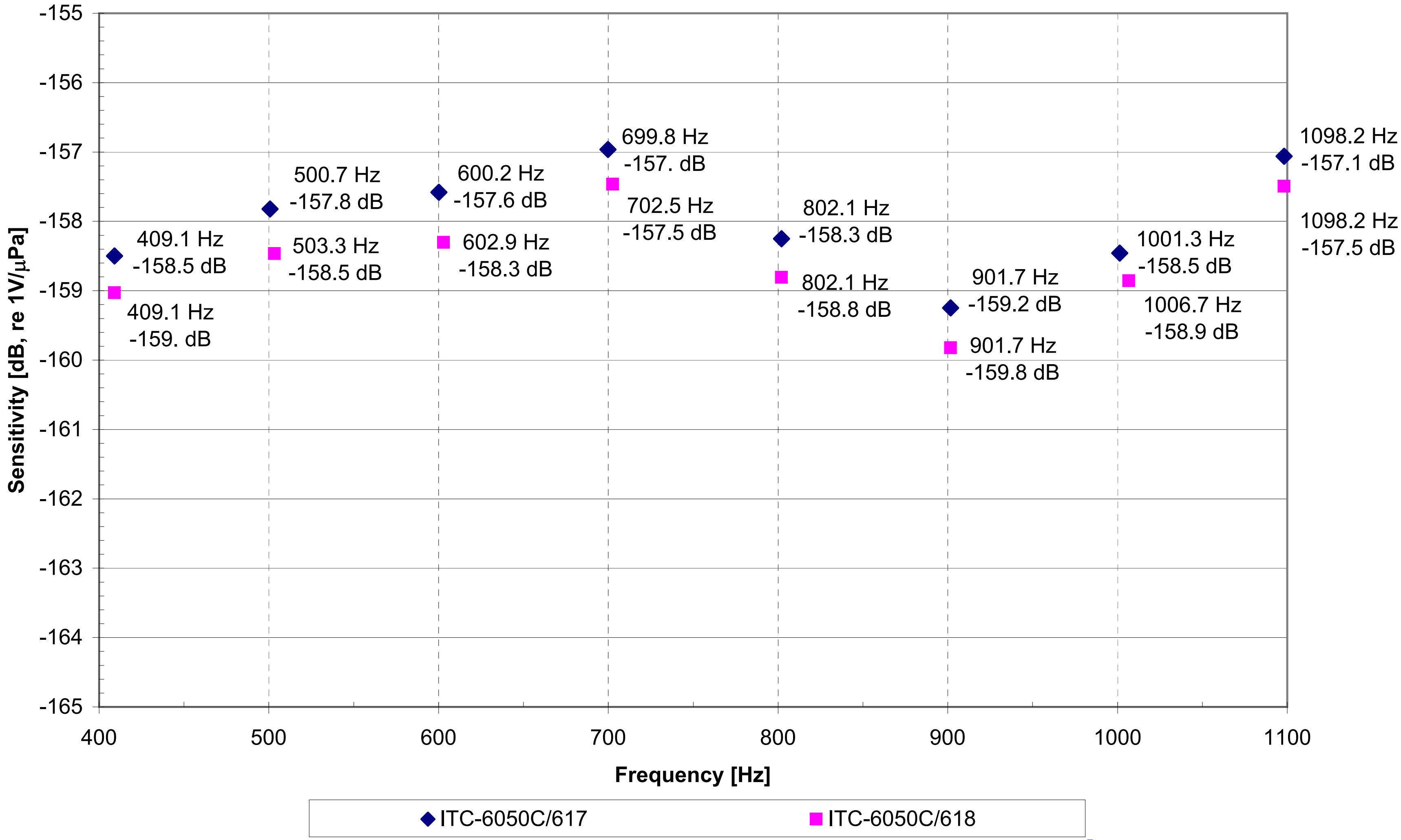


International Transducer Corporation

869 Ward Drive, Santa Barbara, CA 93111
805.683.2575 • 805.967.8199 FAX
www.itc-transducers.com

Cetacean Research Technology
4728 12th Ave. NE
Seattle, WA 98105
www.cetaceanresearch.com

ITC-6050C/617 Mean Sensitivity = -158.0dB
ITC-6050C/618 Mean Sensitivity = -158.5dB



Method: USRD C100 Hydrophone Calibrator + ST191DSA
Water Temperature: 80F

Measurement Date: 26 August 2013

Attachment II. Calibration Record of Ecological Acoustic Recorders (EARs) by Oceanway Corporation Limited

Oceanway Corporation Limited

Unit. 3, G/F., N0. 34, Tai Chung Hau Village, Sai Kung, Hong Kong(S.A.R.), P.R.C.
Tel: (852) 2791 5331 Fax: (852) 2792 5331

REPORT ON ACOUSTICAL MEASUREMENTS
CONDUCTED FOR

Hong Kong Cetacean Research Project

EQUIPMENT TESTED
Hydrophone on an Environmental Acoustic Recorder (EAR)
EAR S/N : 9300708B088
(B1)

REPORT NUMBER : EARS-001

PREPARED BY: Gus ZHANG Cheng

PREPARED ON: 13th September 2013

TABLE OF CONTENTS

TEST OBJECTIVE

The test objective for this report was designed to reproduce the frequency testing carried for the hydrophone model SQ26-01, fitted to an Environmental Acoustic Recorder (EAR).

The SQ26-01 is manufactured by Sensor Technology Limited, a Canadian Company with an address given as P.O. Box 97, Collingwood, Ontario, Canada L9Y 3Z4. The hydrophone SQ26-01 is described as a general purpose, low-cost electrically shielded hydrophone.

The Environmental Acoustic Recorder (EAR) is supplied by Oceanwide Science Institute with an address given as 3620 Baldwin Ave. Ste 204, Makawao, HI 96768, U.S.A.

MEASUREMENT INSTRUMENTATION

The measurement Instrumentation was comprised of a calibrated hydrophone probe, an Agilent Technologies DSO-X-3024A Digital Oscilloscope, and an 8116A Hewlett Packard Pulse/Function Generator. All results were recorded in a Dell Laptop running Excel.

Two calibrated by-laminar membrane hydrophones were used. One used for the frequency range from 0.1KHz to 20KHz, the other from 15KHz to 50KHz. The overlap of frequency was used to check the calibration of both of the equipment used.

MEASUREMENT SETUP

The 0.1KHz to 20KHz by-laminar membrane hydrophone was connected to the Hewlett Packard Signal Generator. The unit was set to give a single frequency sine wave at a voltage level of 30Vp-p.

The hydrophone on the EAR's unit (model SQ26-01) was electrically disconnected from the electronic circuit and directly connected to the Agilent Digital oscilloscope. The latter was configured to display the signal being received by the hydrophone as well as the Fast Fourier Transformation (FFT) of that signal.

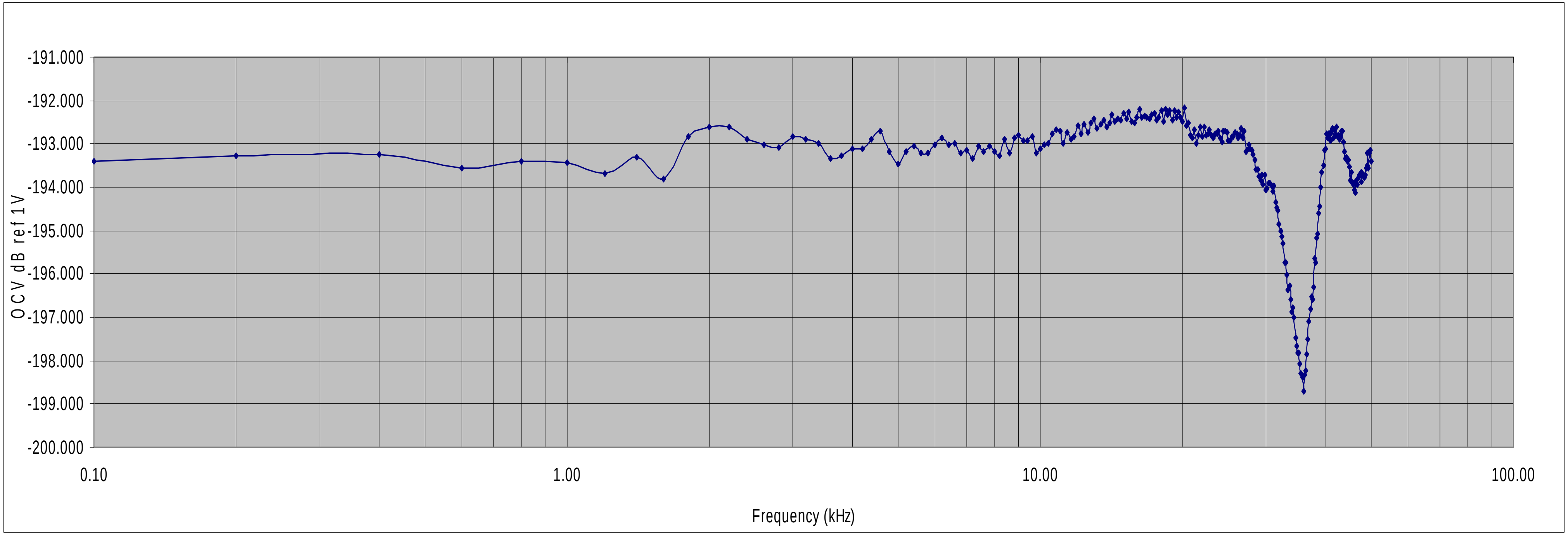
The by-laminar membrane hydrophone was mechanically connected to the top of the SQ26-01 hydrophone.

The frequency of the signal Generator was varied in 200Hz graduations through the range of 0.1KHz to 50KHz and the corresponding height of the FFT displayed result was measured using the calibrated internal cursor on the oscilloscope screen. In all a total of 250 readings were taken.

Agilent Technologies DSO-X-3024A serial number : MY52161670
Hewlett Packard Function Generator serial number : 178667-03

RESULTS

The results of the testing for frequencies from 0.1KHz to 50KHz are shown in the Received Voltage Response graph below:



Temperature during the test = 20ºC.
Pressure was 1.001mB
Location of test : HKU Laboratory
Date of test = 7th September 2013.

PERFORMANCE STATEMENT

The results of these tests shows that the maximum received frequency attenuation deviation of the SQ26-01 hydrophone fitted to the EAR unit with serial number 9300708B088, as compared to the manufacturers quoted specification (see Appendix A for details) is less than 0.5dBA. This gives a worst case deviation of <±1dBA. This is an acceptable result for such a sensor given the specification quotes a deviation of ±1dBA is acceptable (see Appendix A).

Signed : ______________________________

Date : _13th September 2013.

APPENDIX A - SQ23-01 Data Sheet

The SQ23-01 data sheet showing the frequency attenuation response.

SENSOR

Sensor Technology Limited

Hydrophone SQ26-01

Features

- Low cost
- Rugged
- Good depth capability

Applications

- General purpose research
- Towed arrays

Overview

The SQ26-01 is a general-purpose low-cost electrically shielded hydrophone. It has good sensitivity, wide bandwidth, and good stability. Custom configurations of these hydrophones are also available. For additional data on frequency response or outline drawings, please call our technical support. All parameters are measured after hydrophones have been subjected to pressures of 70 bar. The polyurethane-encapsulated hydrophone will withstand continuous immersion in isoparaffinic hydrocarbon fluids and sea water.

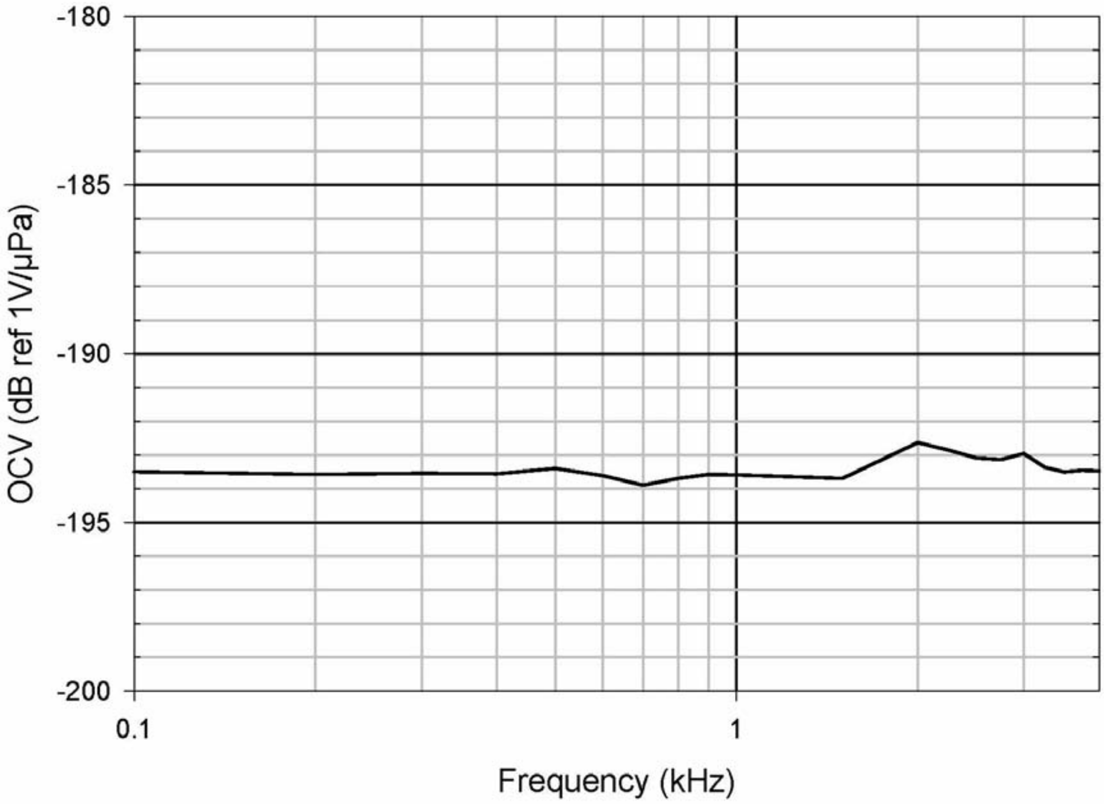
Specifications

Voltage sensitivity	-193.5 ± 1.0 dBV re 1 µPa @ 20 °C, 20 V/bar
Charge sensitivity	24 nC/bar
Capacitance	1.4 nF ± 10 % @ 20 °C
Sensitivity variation with temperature	less than 1 dB loss from 0 to 35 °C
Capacitance variation with temperature	0.33% increase per °C
Capacitance variation with depth	7% loss per 1,000 m
Operating depth	down to 1,000 m
Frequency response	flat from 1 Hz to 28,000 Hz
Acceleration sensitivity	< 0.2 mbar/g when properly mounted
Storage and operating temperature	-30 to +60 °C
Diameter	25.4 mm (1.0")
Length	25.4 mm (1.0") max
Mass	16 grams
Electrical leads	two-wire shielded, 28AWG, 30cm (12") long
Shielding	integral Faraday cage type
Electrical insulation	> 500 M Ohms
Water blocked leads	No

Sensor Technology Limited, PO Box 97, Collingwood Ontario, Canada L9Y 3Z4
Tel (705) 444-1440 Fax (705) 444-6787 www.Sensortech.ca Email: techsupport@Sensortech.ca

Rev. 09/03

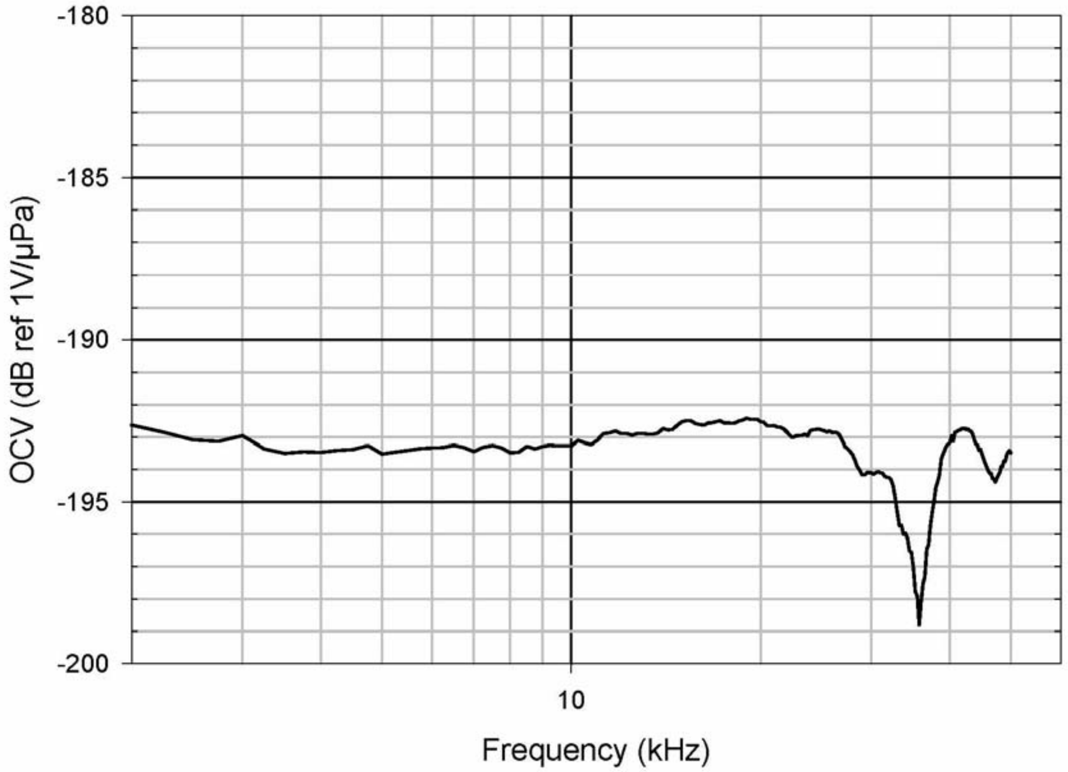
Receive Voltage Response
SQ26 (typical)



Date: October 4, 2004
Acoustic Test Facility: Newport Rhode Island
Transducer Model: SQ26
Test Frequency: 100 - 3000Hz
Spacing: 2.32 meters
Depth: 12 meters
Plane: XZ

SENSOR
Sensor Technology Limited

Receive Voltage Response
SQ26 (typical)



Date: Sept 16, 2004
Acoustic Test Facility: Seneca Lake Sonar Test Facility
Transducer Model: SQ26
Test Frequency: 2 - 50kHz
Spacing: 2.32 meters
Depth: 12 meters
Plane: XZ

SENSOR
Sensor Technology Limited

APPENDIX B - Raw Data

The raw data collected during the testing:

Frequency KHz	Log10 (v) dB
0.10	-193.403
0.20	-193.271
0.40	-193.241
0.60	-193.557
0.80	-193.394
1.00	-193.422
1.20	-193.678
1.40	-193.321
1.60	-193.797
1.80	-192.845
2.00	-192.598
2.20	-192.621
2.40	-192.901
2.60	-193.011
2.80	-193.073
3.00	-192.842
3.20	-192.897
3.40	-192.979
3.60	-193.346
3.80	-193.282
4.00	-193.112
4.20	-193.106
4.40	-192.895
4.60	-192.703
4.80	-193.175
5.00	-193.448
5.20	-193.184
5.40	-193.052
5.60	-193.224
5.80	-193.212
6.00	-193.028
6.20	-192.861
6.40	-193.035
6.60	-192.981
6.80	-193.201
7.00	-193.153
7.20	-193.338
7.40	-193.046
7.60	-193.184
7.80	-193.055
8.00	-193.178
8.20	-193.274
8.40	-192.902
8.60	-193.225
8.80	-192.873
9.00	-192.813
9.20	-192.918
9.40	-192.931
9.60	-192.845
9.80	-193.214
10.00	-193.104
10.20	-193.008
10.40	-192.999
10.60	-192.766
10.80	-192.689
11.00	-192.708
11.20	-192.984
11.40	-192.728
11.60	-192.888
11.80	-192.827
12.00	-192.582
12.20	-192.783
12.40	-192.554
12.60	-192.744
12.80	-192.509
13.00	-192.429
13.20	-192.641
13.40	-192.535
13.60	-192.445
13.80	-192.610

Frequency KHz	Log10 (v) dB
14.00	-192.520
14.20	-192.336
14.40	-192.477
14.60	-192.417
14.80	-192.454
15.00	-192.287
15.20	-192.435
15.40	-192.279
15.60	-192.474
15.80	-192.505
16.00	-192.384
16.20	-192.190
16.40	-192.380
16.60	-192.349
16.80	-192.402
17.00	-192.411
17.20	-192.328
17.40	-192.303
17.60	-192.440
17.80	-192.380
18.00	-192.217
18.20	-192.487
18.40	-192.194
18.60	-192.341
18.80	-192.233
19.00	-192.439
19.20	-192.226
19.40	-192.387
19.60	-192.251
19.80	-192.403
20.00	-192.485
20.20	-192.169
20.40	-192.570
20.60	-192.515
20.80	-192.810
21.00	-192.874
21.20	-192.660
21.40	-192.975
21.60	-192.804
21.80	-192.602
22.00	-192.837
22.20	-192.615
22.40	-192.797
22.60	-192.769
22.80	-192.671
23.00	-192.790
23.20	-192.872
23.40	-192.781
23.60	-192.760
23.80	-192.708
24.00	-192.856
24.20	-192.949
24.40	-192.695
24.60	-192.714
24.80	-192.748
25.00	-192.939
25.20	-192.916
25.40	-192.843
25.60	-192.824
25.80	-192.735
26.00	-192.766
26.20	-192.865
26.40	-192.809
26.60	-192.656
26.80	-192.854
27.00	-192.709
27.20	-193.172
27.40	-193.148
27.60	-193.035
27.80	-193.119

Frequency KHz	Log10 (v) dB
28.00	-193.161
28.20	-193.244
28.40	-193.373
28.60	-193.578
28.80	-193.589
29.00	-193.736
29.20	-193.831
29.40	-193.713
29.60	-193.925
29.80	-193.702
30.00	-194.070
30.20	-194.016
30.40	-193.893
30.60	-193.896
30.80	-193.976
31.00	-194.104
31.20	-193.959
31.40	-194.362
31.60	-194.479
31.80	-194.547
32.00	-194.844
32.20	-195.025
32.40	-195.137
32.60	-195.290
32.80	-195.729
33.00	-195.733
33.20	-196.015
33.40	-196.356
33.60	-196.283
33.80	-196.582
34.00	-196.882
34.20	-196.784
34.40	-196.985
34.60	-197.486
34.80	-197.665
35.00	-197.824
35.20	-197.827
35.40	-198.077
35.60	-198.298
35.80	-198.398
36.00	-198.697
36.20	-198.311
36.40	-198.217
36.60	-197.842
36.80	-197.493
37.00	-197.080
37.20	-196.823
37.40	-196.529
37.60	-196.597
37.80	-196.315
38.00	-195.656
38.20	-195.731
38.40	-195.181
38.60	-195.073
38.80	-194.599
39.00	-194.453
39.20	-194.009
39.40	-193.661
39.60	-193.499
39.80	-193.158
40.00	-193.125
40.20	-192.755
40.40	-192.864
40.60	-192.753
40.80	-192.807
41.00	-192.930
41.20	-192.695
41.40	-192.646
41.60	-192.876
41.80	-192.662

Frequency KHz	Log10 (v) dB
42.00	-192.790
42.20	-192.597
42.40	-192.832
42.60	-192.787
42.80	-192.909
43.00	-192.809
43.20	-192.817
43.40	-192.710
43.60	-192.702
43.80	-192.962
44.00	-193.165
44.20	-193.335
44.40	-193.299
44.60	-193.386
44.80	-193.380
45.00	-193.517
45.20	-193.826
45.40	-193.651
45.60	-193.903
45.80	-193.950
46.00	-193.905
46.20	-194.049
46.40	-194.121
46.60	-193.841
46.80	-193.944
47.00	-193.775
47.20	-193.707
47.40	-193.704
47.60	-193.658
47.80	-193.874
48.00	-193.679
48.20	-193.726
48.40	-193.764
48.60	-193.712
48.80	-193.561
49.00	-193.498
49.20	-193.222
49.40	-193.552
49.60	-193.225
49.80	-193.157
50.00	-193.390

Oceanway Corporation Limited
Unit. 3, G/F., N0. 34, Tai Chung Hau Village, Sai Kung, Hong Kong(S.A.R.), P.R.C.
Tel: (852) 2791 5331 Fax: (852) 2792 5331

REPORT ON ACOUSTICAL MEASUREMENTS
CONDUCTED FOR

Hong Kong Cetacean Research Project

EQUIPMENT TESTED
Hydrophone on an Environmental Acoustic Recorder (EAR)
EAR S/N : 9300479B100
(B2)

REPORT NUMBER : EARS-002

PREPARED BY: Gus ZHANG Cheng

PREPARED ON: 13th September 2013

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TEST OBJECTIVE

The test objective for this report was designed to reproduce the frequency testing carried for the hydrophone model SQ26-01, fitted to an Environmental Acoustic Recorder (EAR).

The SQ26-01 is manufactured by Sensor Technology Limited, a Canadian Company with an address given as P.O. Box 97, Collingwood, Ontario, Canada L9Y 3Z4. The hydrophone SQ26-01 is described as a general purpose, low-cost electrically shielded hydrophone.

The Environmental Acoustic Recorder (EAR) is supplied by Oceanwide Science Institute with an address given as 3620 Baldwin Ave. Ste 204, Makawao, HI 96768, U.S.A.

MEASUREMENT INSTRUMENTATION

The measurement Instrumentation was comprised of a calibrated hydrophone probe, an Agilent Technologies DSO-X-3024A Digital Oscilloscope, and an 8116A Hewlett Packard Pulse/Function Generator. All results were recorded in a Dell Laptop running Excel.

Two calibrated by-laminar membrane hydrophones were used. One used for the frequency range from 0.1KHz to 20KHz, the other from 15KHz to 50KHz. The overlap of frequency was used to check the calibration of both of the equipment used.

MEASUREMENT SETUP

The 0.1KHz to 20KHz by-laminar membrane hydrophone was connected to the Hewlett Packard Signal Generator. The unit was set to give a single frequency sine wave at a voltage level of 30Vp-p.

The hydrophone on the EAR's unit (model SQ26-01) was electrically disconnected from the electronic circuit and directly connected to the Agilent Digital oscilloscope. The latter was configured to display the signal being received by the hydrophone as well as the Fast Fourier Transformation (FFT) of that signal.

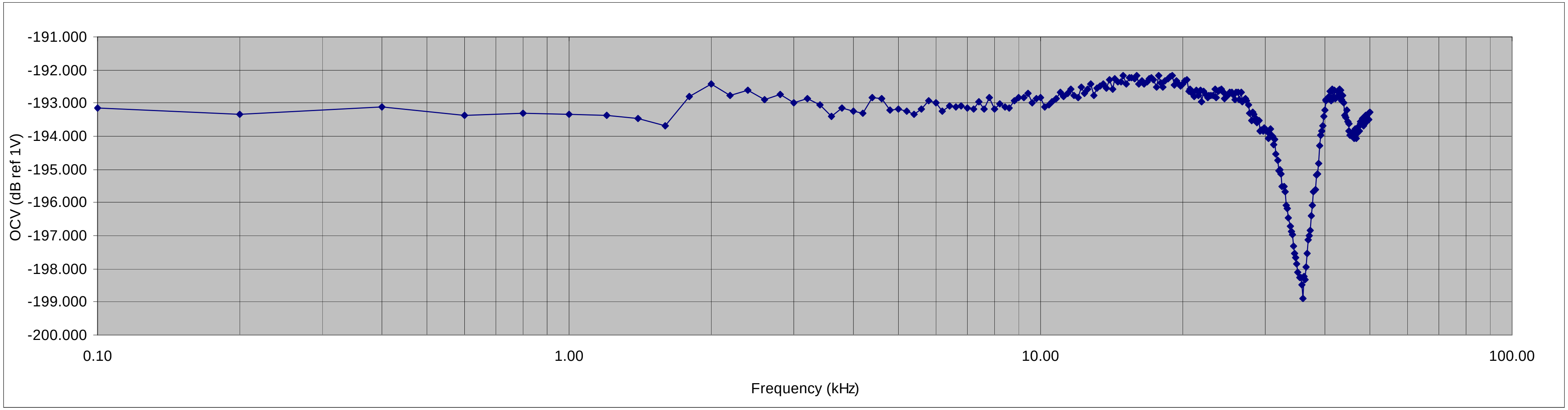
The by-laminar membrane hydrophone was mechanically connected to the top of the SQ26-01 hydrophone.

The frequency of the signal Generator was varied in 200Hz graduations through the range of 0.1KHz to 50KHz and the corresponding height of the FFT displayed result was measured using the calibrated internal cursor on the oscilloscope screen. In all a total of 251 readings were taken.

Agilent Technologies DSO-X-3024A serial number : MY52161670
Hewlett Packard Function Generator serial number : 178667-03

RESULTS

The results of the testing for frequencies from 0.1KHz to 50KHz are shown in the Received Voltage Response graph below:



Temperature during the test = 20ºC.
Pressure was 1.003mB
Location of test : HKU Laboratory
Date of test = 10th September 2013.

PERFORMANCE STATEMENT

The results of these tests shows that the maximum received frequency attenuation deviation of the SQ26-01 hydrophone fitted to the EAR unit with serial number 9300479B100, as compared to the manufacturers quoted specification (see Appendix A for details) is less than 0.4dBA. This gives a worst case deviation of <±1dBA. This is an acceptable result for such a sensor given the specification quotes a deviation of ±1dBA is acceptable (see Appendix A).

Signed : ______________________________

Date : 13th September 2013

APPENDIX A - SQ23-01 Data Sheet

The SQ23-01 data sheet showing the frequency attenuation response.

SENSOR

Sensor Technology Limited

Hydrophone SQ26-01

Features

- Low cost
- Rugged
- Good depth capability

Applications

- General purpose research
- Towed arrays

Overview

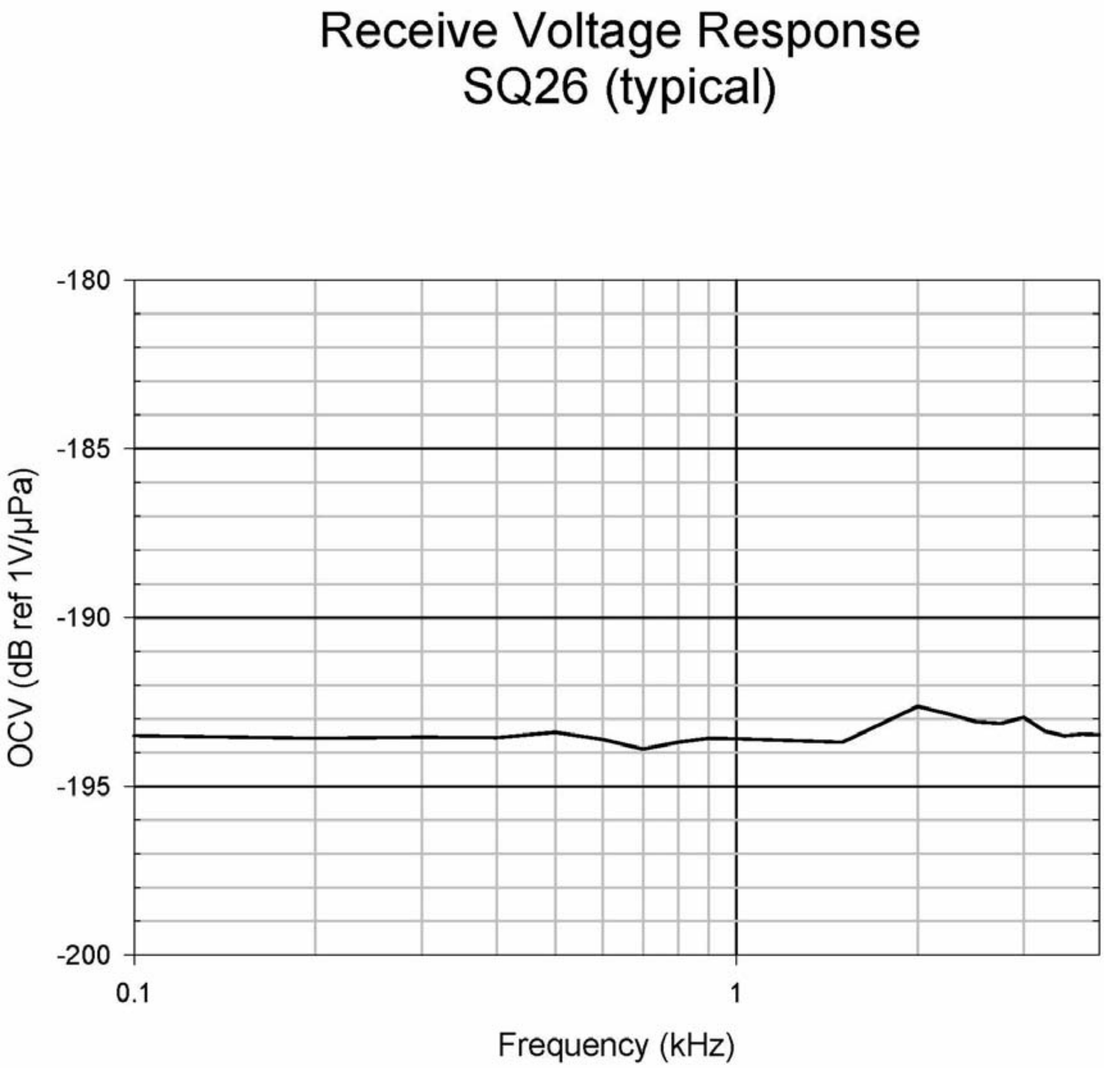
The SQ26-01 is a general-purpose low-cost electrically shielded hydrophone. It has good sensitivity, wide bandwidth, and good stability. Custom configurations of these hydrophones are also available. For additional data on frequency response or outline drawings, please call our technical support. All parameters are measured after hydrophones have been subjected to pressures of 70 bar. The polyurethane-encapsulated hydrophone will withstand continuous immersion in isoparaffinic hydrocarbon fluids and sea water.

Specifications

Voltage sensitivity	-193.5 ± 1.0 dBV re 1 µPa @ 20 °C, 20 V/bar
Charge sensitivity	24 nC/bar
Capacitance	1.4 nF ± 10 % @ 20 °C
Sensitivity variation with temperature	less than 1 dB loss from 0 to 35 °C
Capacitance variation with temperature	0.33% increase per °C
Capacitance variation with depth	7% loss per 1,000 m
Operating depth	down to 1,000 m
Frequency response	flat from 1 Hz to 28,000 Hz
Acceleration sensitivity	< 0.2 mbar/g when properly mounted
Storage and operating temperature	-30 to +60 °C
Diameter	25.4 mm (1.0")
Length	25.4 mm (1.0") max
Mass	16 grams
Electrical leads	two-wire shielded, 28AWG, 30cm (12") long
Shielding	integral Faraday cage type
Electrical insulation	> 500 M Ohms
Water blocked leads	No

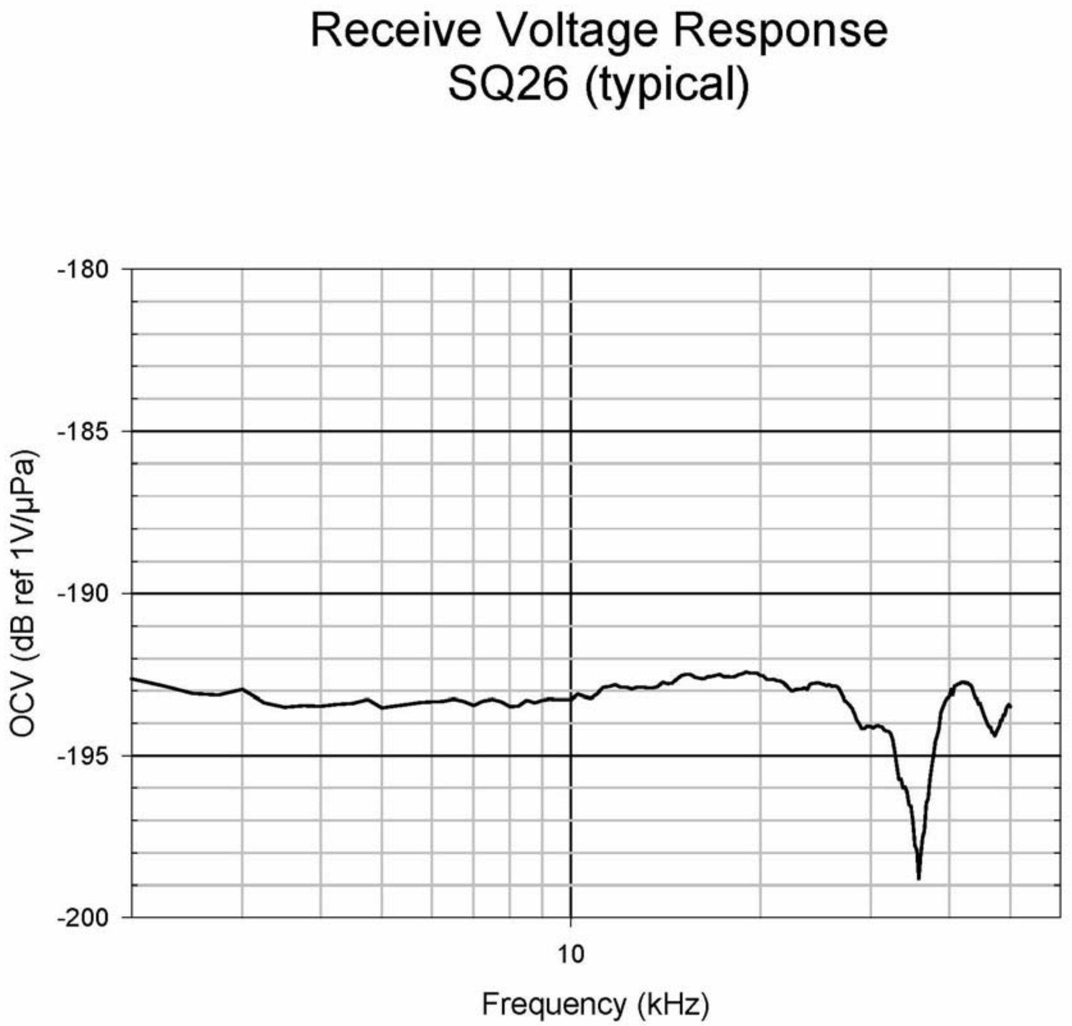
Sensor Technology Limited, PO Box 97, Collingwood Ontario, Canada L9Y 3Z4
Tel (705) 444-1440 Fax (705) 444-6787 www.Sensortech.ca Email: techsupport@Sensortech.ca

Rev. 09/03



Date: October 4, 2004
Acoustic Test Facility: Newport Rhode Island
Transducer Model: SQ26
Test Frequency: 100 - 3000Hz
Spacing: 2.32 meters
Depth: 12 meters
Plane: XZ

SENSOR
Sensor Technology Limited



Date: Sept 16, 2004
Acoustic Test Facility: Seneca Lake Sonar Test Facility
Transducer Model: SQ26
Test Frequency: 2 - 50kHz
Spacing: 2.32 meters
Depth: 12 meters
Plane: XZ

SENSOR
Sensor Technology Limited

APPENDIX B - Raw Data

The raw data collected during the testing:

Frequency KHz	Log10 (v) dB
0.100	-193.134
0.200	-193.349
0.400	-193.114
0.600	-193.356
0.800	-193.320
1.000	-193.341
1.200	-193.370
1.400	-193.478
1.600	-193.684
1.800	-192.800
2.000	-192.409
2.200	-192.780
2.400	-192.603
2.600	-192.908
2.800	-192.737
3.000	-192.988
3.200	-192.851
3.400	-193.045
3.600	-193.408
3.800	-193.151
4.000	-193.238
4.200	-193.300
4.400	-192.845
4.600	-192.856
4.800	-193.219
5.000	-193.164
5.200	-193.234
5.400	-193.322
5.600	-193.177
5.800	-192.918
6.000	-192.993
6.200	-193.230
6.400	-193.080
6.600	-193.103
6.800	-193.082
7.000	-193.154
7.200	-193.174
7.400	-192.946
7.600	-193.178
7.800	-192.828
8.000	-193.170
8.200	-193.027
8.400	-193.112
8.600	-193.149
8.800	-192.921
9.000	-192.833
9.200	-192.818
9.400	-192.690
9.600	-192.982
9.800	-192.859
10.000	-192.825
10.200	-193.130
10.400	-193.040
10.600	-192.961
10.800	-192.869
11.000	-192.685
11.200	-192.790
11.400	-192.712
11.600	-192.575
11.800	-192.771
12.000	-192.824
12.200	-192.525
12.400	-192.701
12.600	-192.570
12.800	-192.424
13.000	-192.782
13.200	-192.536
13.400	-192.495
13.600	-192.416
13.800	-192.563

Frequency KHz	Log10 (v) dB
14.000	-192.293
14.200	-192.567
14.400	-192.274
14.600	-192.353
14.800	-192.372
15.000	-192.159
15.200	-192.416
15.400	-192.242
15.600	-192.235
15.800	-192.269
16.000	-192.154
16.200	-192.411
16.400	-192.334
16.600	-192.410
16.800	-192.351
17.000	-192.271
17.200	-192.240
17.400	-192.290
17.600	-192.512
17.800	-192.155
18.000	-192.391
18.200	-192.500
18.400	-192.337
18.600	-192.251
18.800	-192.186
19.000	-192.167
19.200	-192.445
19.400	-192.342
19.600	-192.429
19.800	-192.489
20.000	-192.428
20.200	-192.331
20.400	-192.303
20.600	-192.648
20.800	-192.575
21.000	-192.692
21.200	-192.789
21.400	-192.610
21.600	-192.753
21.800	-192.619
22.000	-192.946
22.200	-192.652
22.400	-192.739
22.600	-192.830
22.800	-192.779
23.000	-192.766
23.200	-192.777
23.400	-192.577
23.600	-192.847
23.800	-192.648
24.000	-192.619
24.200	-192.563
24.400	-192.676
24.600	-192.848
24.800	-192.756
25.000	-192.780
25.200	-192.683
25.400	-192.669
25.600	-192.744
25.800	-192.904
26.000	-192.679
26.200	-192.674
26.400	-192.897
26.600	-192.679
26.800	-192.946
27.000	-192.906
27.200	-192.863
27.400	-192.936
27.600	-193.068
27.800	-193.319

Frequency KHz	Log10 (v) dB
28.000	-193.526
28.200	-193.260
28.400	-193.341
28.600	-193.449
28.800	-193.576
29.000	-193.522
29.200	-193.833
29.400	-193.798
29.600	-193.852
29.800	-193.749
30.000	-193.779
30.200	-193.830
30.400	-194.057
30.600	-193.921
30.800	-193.789
31.000	-194.000
31.200	-194.263
31.400	-194.096
31.600	-194.534
31.800	-194.718
32.000	-195.050
32.200	-195.012
32.400	-195.149
32.600	-195.528
32.800	-195.516
33.000	-195.678
33.200	-196.071
33.400	-196.176
33.600	-196.466
33.800	-196.717
34.000	-196.858
34.200	-196.959
34.400	-197.301
34.600	-197.523
34.800	-197.652
35.000	-197.850
35.200	-198.104
35.400	-198.270
35.600	-198.277
35.800	-198.473
36.000	-198.884
36.200	-198.246
36.400	-198.323
36.600	-197.958
36.800	-197.543
37.000	-197.135
37.200	-196.988
37.400	-196.846
37.600	-196.396
37.800	-196.097
38.000	-195.666
38.200	-195.605
38.400	-195.172
38.600	-195.144
38.800	-194.835
39.000	-194.277
39.200	-193.983
39.400	-193.829
39.600	-193.696
39.800	-193.386
40.000	-193.195
40.200	-192.936
40.400	-192.886
40.600	-192.876
40.800	-192.838
41.000	-192.795
41.200	-192.650
41.400	-192.922
41.600	-192.572
41.800	-192.827

Frequency KHz	Log10 (v) dB
42.000	-192.597
42.200	-192.870
42.400	-192.817
42.600	-192.816
42.800	-192.680
43.000	-192.574
43.200	-192.597
43.400	-192.925
43.600	-192.892
43.800	-192.773
44.000	-192.977
44.200	-193.356
44.400	-193.446
44.600	-193.209
44.800	-193.559
45.000	-193.629
45.200	-193.845
45.400	-193.956
45.600	-193.981
45.800	-193.919
46.000	-193.975
46.200	-194.059
46.400	-193.863
46.600	-193.780
46.800	-194.056
47.000	-193.917
47.200	-193.722
47.400	-193.827
47.600	-193.635
47.800	-193.564
48.000	-193.548
48.200	-193.477
48.400	-193.681
48.600	-193.571
48.800	-193.623
49.000	-193.375
49.200	-193.553
49.400	-193.324
49.600	-193.312
49.800	-193.489
50.000	-193.265

GUS, ZHANG CHENG

Post Doctoral Student Engineer

Mr. Gus Zhang Cheng is a young aspiring student engineer who has experience across a wide platform of engineering disciplines. He is currently developing practical systems to facilitate wireless power transfer for consumer electronics. He has represented the City University in the International MATE Underwater Robot Competition held in the U.S.A. He has also taught several short courses to undergraduate university students. Gus Zhang was involved in the DataBuoy Project that streams marine data onto the internet for secondary school and university student use.

Education

- 2012 – Present The University of Hong Kong, HK. Ph.D candidate.
  Areas of Concentration: Wireless Energy Transfer, Power Electronics

- 2008 - 2012 City University of Hong Kong, HK. B.Eng. (Hons.) in Electronic and Communication Engineering – *First Class Honours*
  Minor: Computer Sciences
  Minor: Business Intelligence

Extracurricular Activities

Chief Designer and Technician, ROV Operator 2010 - 2011. Designed underwater robots, programmed control software, operated ROV for the Underwater Robot Team of City University of Hong Kong for the U. S. A. MATE Underwater Robot Challenge, Hong Kong.

Mentor 2013. Helped the underwater Robot team for City University of Hong Kong in Underwater robotic design and development

Judge 2010 - 2013. Was part of the Underwater Robot Security Check for the MATE Underwater Robot Challenge, Hong Kong.

Key Posts & Projects

Teaching Assistant 2013. Taught Advanced Power Electronics at The University of Hong Kong, HK.

Part-Time Lecturer 2008. Taught Algorithms and Data Structure at Wuxi No.1 Middle School, Wuxi, PRC.

Summer Intern 2010 - 2012. Designed and developed underwater data collection systems for Oceanway Corporation Limited, HK.

Research Assistant 2010. Fixed and re-developed laser software of excitation source and monochrome scope for the laser excitement laboratory in City University of Hong Kong, HK.

Awards

Hong Kong PhD Fellowship, 2012 – Present
Hong Kong Government Scholarship, 2009 – 2012
City University of Hong Kong Entry Scholarship (2nd Class), 2008 – 2009

Publication and Papers

(2013)A Time-Efficient Methodology For Visualizing Time-Varying Magnetic Flux Patterns of Mid-Range Wireless Power Transfer Systems
Paper presented at ECCE 2013,Denver, CO

Languages

Chinese Wu – Native Language
Chinese Mandarin – Native Language
Chinese Cantonese – Speak fluently
English – Speak fluently and read/write with high proficiency

Memberships

IEEE Student Member

Contact Details

301 Haking Wong Building, The University of Hong Kong, Hong Kong SAR

(852) 9202 9536 | galloplus.c@gmail.com

Attachment III. AFCD Permit to deploy EARs in Sha Chau and Lung Kwu Chau Marine Park

漁農自然護理署
郊野公園及海岸公園管理局
九龍長沙灣道 303 號
長沙灣政府合署六樓

Agriculture, Fisheries & Conservation Department
Country & Marine Parks Authority
Cheung Sha Wan Government Offices
303 Cheung Sha Wan Road 6th floor
Kowloon, Hong Kong

本署檔號 OUR REF: (64) AF GR MPA 01/5/2 Pt.14
來函檔號 YOUR REF:
電　　話 TEL NO.: (852) 2150 6870
圖文傳真 Faxline No: (852) 2152 0060

Room 2004, 20/F,
Tamson Plaza, 161 Wai Yip Street,
Kwun Tong, Kowloon
Hong Kong

Attn: Dr. Hung Ka Yiu Samuel

18 September 2013

Dear Dr. Hung,

Application for Permission to Undertake Scientific Study in Sha Chau and Lung Kwu Chau Marine Park

I refer to your application, seeking permission to undertake a research project entitled "Application of Passive Acoustic Monitoring using Ecological Acoustic Recorder (EAR) within Sha Chau and Lung Kwu Chau Marine Park".

The permission is hereby given under Section 17 (5)(a) of the Marine Parks and Marine Reserves Regulation (Cap. 476A) to you for carrying out experimental devices installation activities in relation to the above research in the captioned Marine Park during the period from 18 September 2013 to 30 June 2014 subject to the conditions attached.

If you have any enquiry, please contact Ms. Hiu-yan LI at 2150 7150.

Yours sincerely,

(Alan Chan)
for Director of Agriculture, Fisheries and Conservation

Encl.

cc.
Internal
MP/W