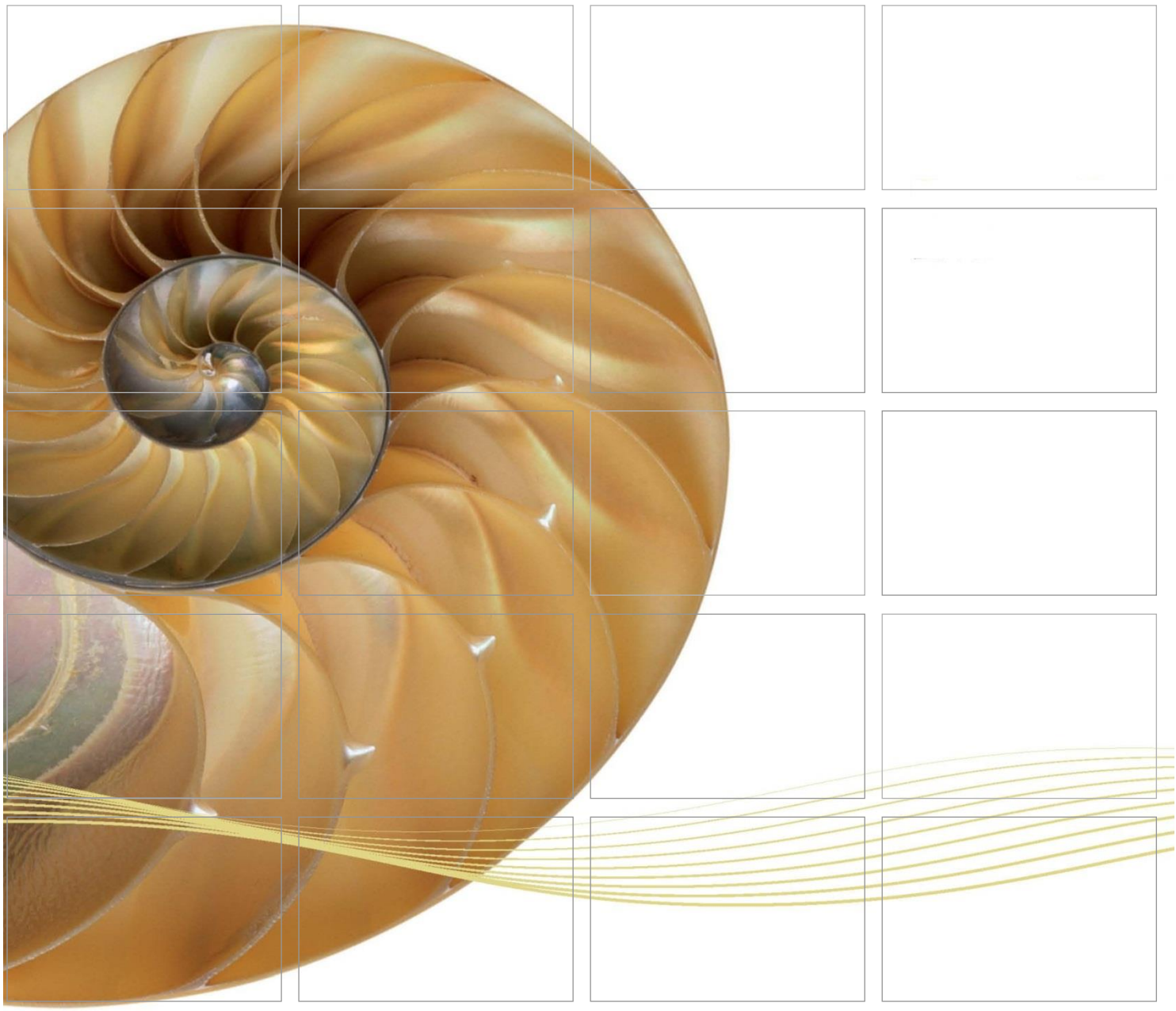
Report



Agreement No. HMWSD 1/2021 (EP) Post-Construction Monitoring of Chinese White Dolphin (Line-transect Vessel Surveys) for Tuen Mun – Chek Lap Kok Link in Northeast and Northwest Lantau Survey Area - Investigation

Second Quarterly Environmental Monitoring & Audit (EM&A) Report

31 March 2022

Environmental Resources Management
2509, 25/F One Harbourfront
18 Tak Fung Street
Hunghom, Kowloon
Hong Kong
Telephone 2271 3000
Facsimile 3015 8052

ERM

The business of sustainability

Agreement No. HMWSD 1/2021 (EP) Post-Construction Monitoring of Chinese White Dolphin (Line-transect Vessel Surveys) for Tuen Mun – Chek Lap Kok Link in Northeast and Northwest Lantau Survey Area - Investigation

Environmental Resources Management

2509, 25/F One Harbourfront
18 Tak Fung Street
Hunghom, Kowloon
Hong Kong
Telephone: (852) 2271 3000
Facsimile: (852) 3015 8052
E-mail: post.hk@erm.com
http://www.erm.com

Second Quarterly Environmental Monitoring & Audit (EM&A) Report

Document Code: 0611663_2nd Quarterly EM&A_20220331.doc

Client: Highways Department	Project No: 0611663
Summary: This document presents the Second Quarterly EM&A Report for Post-Construction Monitoring of Chinese White Dolphin (Line-transect Vessel Surveys) for Tuen Mun – Chek Lap Kok Link in Northeast and Northwest Lantau Survey Area - Investigation	Date: 31 March 2022 Approved by: *Mr Craig Reid* *Partner* Certified by: *Dr Jasmine Ng* *ET Leader*

Revision	Description	By	Checked	Approved	Date
	2nd Quarterly EM&A Report	VAR	JN	CAR	31/03/22

This report has been prepared by Environmental Resources Management the trading name of 'ERM Hong-Kong, Limited', with all reasonable skill, care and diligence within the terms of the Contract with the client, incorporating our General Terms and Conditions of Business and taking account of the resources devoted to it by agreement with the client. We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above.	Distribution ☐ Internal ☒ Public ☐ Confidential

Ref.: HYDHZMBEEM00_0_8701L.22

6 April 2022

By Fax (3691 2899) and By Post

AECOM Asia Co. Ltd.
Supervising Officer Representative's Office
No.8 Mong Fat Street, Tuen Mun, New Territories, Hong Kong

Attention: Mr. K P Wong

Dear Mr. Wong,

Re: Agreement No. CE 48/2011 (EP)
Environmental Project Office for the
HZMB Hong Kong Link Road, HZMB Hong Kong Boundary Crossing Facilities, and Tuen Mun-Chek Lap Kok Link – Investigation

Agreement No. HMWSD 1/2021 (EP)
Post-Construction Monitoring of Chinese White Dolphin (Line-transect Vessel Surveys) for Tuen Mun – Chek Lap Kok Link in Northeast and Northwest Lantau Survey Area – Investigation
2nd Quarterly EM&A Summary Report for December 2021 to February 2022

Reference is made to the ET's submission of 2nd Quarterly EM&A Summary Report for December 2021 to February 2022 (ET's ref.: "*0611663_2nd Quarterly EM&A_20220331.doc*" dated 31 March 2022) certified by the ET Leader.

Please be informed that we have no adverse comments on the captioned Report.

Thank you for your attention. Please do not hesitate to contact the undersigned or the ENPO Leader Mr. Y. H. Hui should you have any queries.

Yours sincerely,

Brian Tam
Independent Environmental Checker
Tuen Mun – Chek Lap Kok Link

c.c.

HyD	Mr. Sally Choi	(By Fax: 3188 6614)
HyD	Mr. Maggie Lai	(By Fax: 3188 6614)
ERM	Dr. Jasmine Ng	(By Fax: 2723 5660)

Q:\Projects\HYDHZMBEEM00\02_Proj_Mgt\02_Corr\2022\HYDHZMBEEM00_0_8701L.22.docx

Ramboll Hong Kong Limited 英環香港有限公司
21/F, BEA Harbour View Centre, 56 Gloucester Road, Wanchai, Hong Kong Tel: 852.3465 2888 Fax: 852.3465 2899
www.Ramboll.com

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Under *Agreement No. HMWSD 1/2021 (EP)*, ERM-Hong Kong, Limited (ERM) has been appointed as the Environmental Team (ET) by the Highways Department (HyD) to undertaken the implementation of post-construction monitoring for the Chinese White Dolphin (CWD) in accordance with *Environmental Permit No. EP-354/2009/D* for the Tuen Mun – Chek Lap Kok Link Project (TM-CLK Link Project). AECOM Asia Company Limited was appointed by HyD as the Supervising Officer while Ramboll Hong Kong Ltd. was employed by HyD as the Independent Environmental Checker (IEC) and Environmental Project Office (ENPO).

The post-construction monitoring for the CWD commenced in June 2020 and will be completed in May 2022.

This is the Second Quarterly EM&A report presenting the EM&A works carried out during the period from 1 December 2021 to 28 February 2022 for the *Agreement No. HMWSD 1/2021 (EP) Post-Construction Monitoring of Chinese White Dolphin (Line-transect Vessel Surveys) for Tuen Mun – Chek Lap Kok Link in Northeast and Northwest Lantau Survey Area – Investigation* (the "Contract") in accordance with the Updated EM&A Manual of the TM-CLK Link Contract.

In order to fulfil the EP's and EM&A Manual's requirements for TM-CLKL Project, *Agreement No. HMWSD 1/2021 (EP)* took over the responsibility for implementation of operational phase dolphin monitoring from *Contract No. HY/2012/08* from 1 September 2021 to 31 May 2022.

A summary of monitoring and audit activities conducted in the reporting period is listed below:

Operational Phase Dolphin Monitoring 6 sessions

<u>Summary of Breaches of Action/Limit Levels</u>

One (1) Limit Level exceedance was observed for the quarterly dolphin monitoring data between December 2021 and February 2022.

<u>Environmental Complaints, Non-compliance & Summons</u>

No non-compliance with EIA recommendations, EP conditions and other requirements associated with the construction of this Contract was recorded in this reporting period.

No environmental complaint was received in this reporting period.

No environmental summons was received in this reporting period.

<u>Reporting Change</u>

In order to fulfil the EP's and EM&A Manual's requirements for TM-CLKL Project, *Agreement No. HMWSD 1/2021 (EP)* took over the responsibility for implementation of operational phase dolphin monitoring from *Contract No. HY/2012/08* from 1 September 2021 to 31 May 2022.

1 INTRODUCTION

1.1 BACKGROUND

According to the findings of the Northwest New Territories (NWNT) Traffic and Infrastructure Review conducted by the Transport Department, Tuen Mun Road, Ting Kau Bridge, Lantau Link and North Lantau Highway would be operating beyond capacity after 2016. This forecast has been based on the estimated increase in cross boundary traffic, developments in the Northwest New Territories (NWNT), and possible developments in North Lantau, including the Airport developments, the Lantau Logistics Park (LLP) and the Hong Kong – Zhuhai – Macao Bridge (HZMB). In order to cope with the anticipated traffic demand, two new road sections between NWNT and North Lantau – Tuen Mun – Chek Lap Kok Link (TM-CLKL) and Tuen Mun Western Bypass (TMWB) are proposed.

An Environmental Impact Assessment (EIA) of TM-CLKL (the Project) was prepared in accordance with the EIA Study Brief (No. ESB-175/2007) and the *Technical Memorandum of the Environmental Impact Assessment Process* (*EIAO-TM*). The EIA Report was submitted under the Environmental Impact Assessment Ordinance (EIAO) in August 2009. Subsequent to the approval of the EIA Report (EIAO Register Number AEIAR-146/2009), an Environmental Permit (EP-354/2009) for TM-CLKL was granted by the Director of Environmental Protection (DEP) on 4 November 2009, and EP variation (VEP) (EP-354/2009/A) was issued on 8 December 2010. Subsequent applications for variation of environmental permits (VEP), *EP-354/2009/B, EP-354/2009/C* and *EP-354/2009/D*, were granted on 28 January 2014, 10 December 2014 and 13 March 2015, respectively.

Under *Agreement No. HMWSD 1/2021 (EP)*, ERM-Hong Kong, Limited (ERM) has been appointed as the Environmental Team (ET) by the Highways Department (HyD) to undertaken the implementation of post-construction monitoring for the Chinese White Dolphin (CWD) in accordance with *Environmental Permit No. EP-354/2009/D* for the Tuen Mun – Chek Lap Kok Link Project (TM-CLK Link Project). AECOM Asia Company Limited was appointed by HyD as the Supervising Officer while Ramboll Hong Kong Ltd. was employed by HyD as the Independent Environmental Checker (IEC) and Environmental Project Office (ENPO).

The post-construction monitoring for the CWD commenced on June 2020 and will be completed in May 2022.

In order to fulfil the EP's and EM&A Manual's requirements for TM-CLKL Project, *Agreement No. HMWSD 1/2021 (EP)* took over the responsibility for implementation of operational phase dolphin monitoring from Contract No. HY/2012/08 from 1 September 2021 to 31 May 2022.

1.2 SCOPE OF REPORT

This is the Second Quarterly EM&A Report under the *Agreement No. HMWSD 1/2021 (EP) Post-Construction Monitoring of Chinese White Dolphin (Line-transect Vessel Surveys) for Tuen Mun – Chek Lap Kok Link in Northeast and Northwest Lantau Survey Area – Investigation*. This report presents a summary of the environmental monitoring and audit works from 1 December 2021 and 28 February 2022.

1.3 ORGANIZATION STRUCTURE

The organization structure of the Contract is shown in *Appendix A*. The key personnel contact names and contact details are summarized in *Table 1.1* below.

Table 1.1 Contact Information of Key Personnel

Party	Position	Name	Telephone	Fax
Highways Department	Engr 24/SD	Ken T.M. Cheng	2762 4062	3188 6614
SOR (AECOM Asia Company Limited)	Senior Resident Engineer	K P Wong	2293 6403	2293 6300
ENPO / IEC (Ramboll Hong Kong Ltd.)	ENPO Leader	Y.H. Hui	3465 2850	3465 2899
	IEC	Brian Tam	9700 6767	3465 2899
ET (ERM-HK)	ET Leader	Jasmine Ng	2271 3311	2723 5660

2 EM&A RESULTS

The EM&A programme required environmental monitoring for marine ecology. The EM&A requirements and related findings for the component are summarized in the following sections.

2.1 DOLPHIN MONITORING

2.1.1 Monitoring Requirements

Operational phase dolphin monitoring is required to be conducted by a qualified dolphin specialist team to evaluate whether there have been any effects on the dolphins. According to the EM&A Manual, operational phase monitoring on dolphin monitoring shall be undertaken based upon the frequency of forty-eight, one-day survey events at a frequency of 2 per month over a period of 24 months following cessation of the construction.

In order to fulfil the EM&A requirements and make good use of available resources, *Agreement No. HMWSD 1/2021 (EP)* has taken over the responsibility for implementation of dolphin monitoring from HZMB HKLR *Contract No. HY/2011/03* since October 2019 and *Contract No. HY/2012/08* since September 2021.

2.1.2 Monitoring Equipment

Table 2.1 summarizes the equipment used for the post construction (operational) phase dolphin monitoring.

Table 2.1 Dolphin Monitoring Equipment

Equipment	Model
Global Positioning System (GPS)	Garmin 18X-PC Geo One Phottix
Camera	Nikon D90 300m 2.8D fixed focus Nikon D90 20-300m zoom lens
Laser Binoculars	Infinitor LRF 1000
Marine Binocular	Bushell 7 x 50 marine binocular with compass and reticules
Vessel for Monitoring	65 foot single engine motor vessel with viewing platform 4.5m above water level

2.1.3 Monitoring Parameter, Frequencies & Duration

Dolphin monitoring should cover all transect lines in Northeast Lantau (NEL) and the Northwest Lantau (NWL) survey areas twice per month throughout the entire construction period and operational phase. The monitoring data should be compatible with, and should be made available for, long-term studies of small cetacean ecology in Hong Kong. In order to provide a suitable long-term dataset for comparison, identical methodology and line

transects employed in baseline dolphin monitoring was followed in the impact dolphin monitoring and operational phase dolphin monitoring.

2.1.4 Monitoring Location

The operational phase dolphin monitoring was carried out in the NEL and NWL along the line transect as depicted in *Figure 2.1*. The co-ordinates of all transect lines are shown in *Table 2.2* below.

Table 2.2 Operational Phase Dolphin Monitoring Line Transect Co-ordinates

Line No.		Easting	Northing	Line No.		Easting	Northing
1	Start Point	804671	815456	13	Start Point	816506	819480
1	End Point	804671	831404	13	End Point	816506	824859
2	Start Point	805476	820800*	14	Start Point	817537	820220
2	End Point	805476	826654	14	End Point	817537	824613
3	Start Point	806464	821150*	15	Start Point	818568	820735
3	End Point	806464	822911	15	End Point	818568	824433
4	Start Point	807518	821500*	16	Start Point	819532	821420
4	End Point	807518	829230	16	End Point	819532	824209
5	Start Point	808504	821850*	17	Start Point	820451	822125
5	End Point	808504	828602	17	End Point	820451	823671
6	Start Point	809490	822150*	18	Start Point	821504	822371
6	End Point	809490	825352	18	End Point	821504	823761
7	Start Point	810499	822000*	19	Start Point	822513	823268
7	End Point	810499	824613	19	End Point	822513	824321
8	Start Point	811508	821123	20	Start Point	823477	823402
8	End Point	811508	824254	20	End Point	823477	824613
9	Start Point	812516	821303	21	Start Point	805476	827081
9	End Point	812516	824254	21	End Point	805476	830562
10	Start Point	813525	821176	22	Start Point	806464	824033
10	End Point	813525	824657	22	End Point	806464	829598
11	Start Point	814556	818853	23	Start Point	814559	821739
11	End Point	814556	820992	23	End Point	814559	824768
12	Start Point	815542	818807	24*	Start Point	805476*	815900*
12	End Point	815542	824882	24*	End Point	805476*	819100*

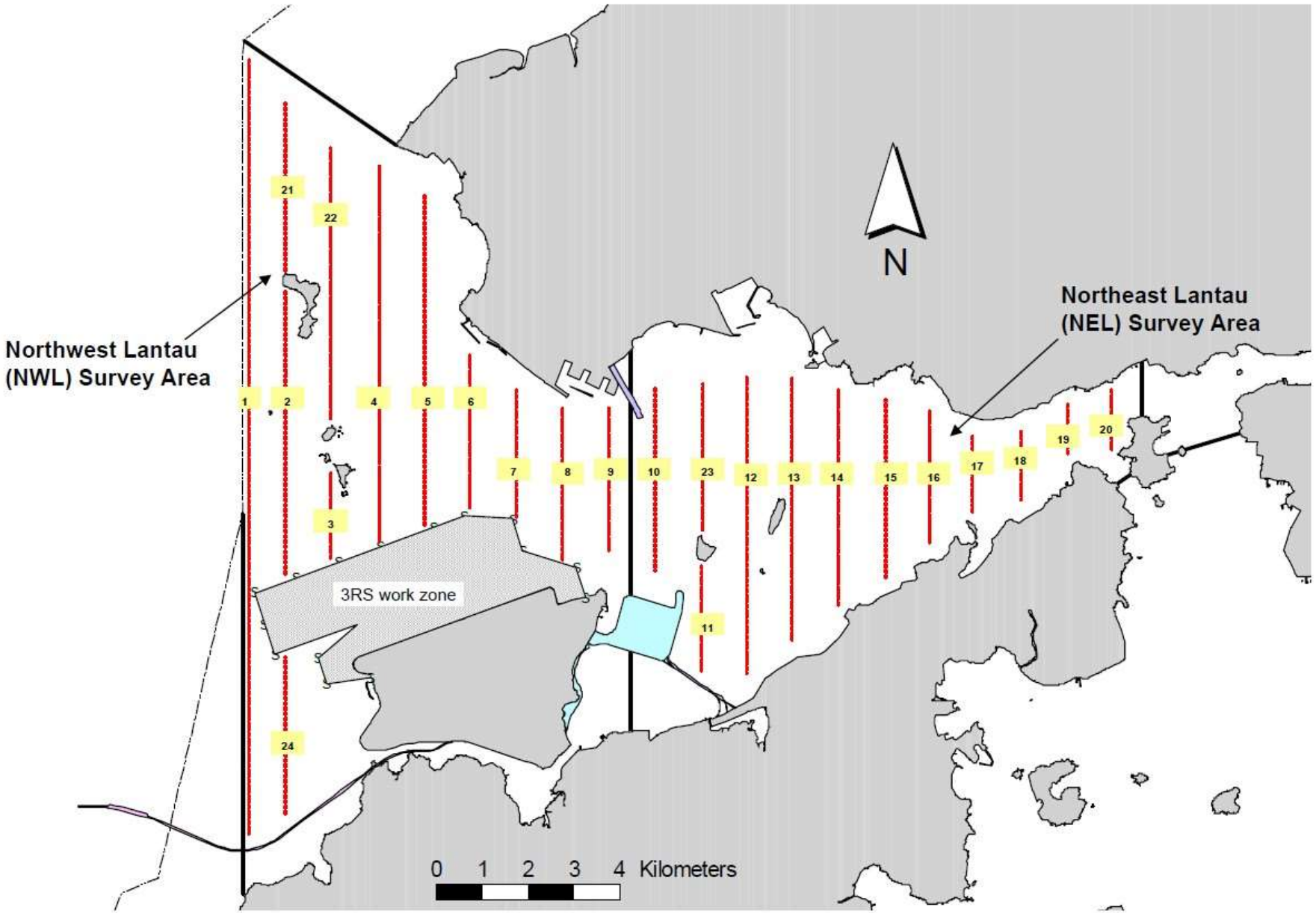


Figure 2.1

Layout of Transect Lines of Dolphin Monitoring in Northwest and Northeast Lantau Areas

File: T:\GIS\CONTRACT\0212330\Mxd\0212330_Transect_of_Dolphin_Monitoring.mxd
Date: 29/11/2013

Environmental
Resources
Management

ERM

Remarks: The coordinates of several starting and ending points have been revised since August 2017 due to the presence of a work zone to the north of the airport platform with intense construction activities in association with the construction of the third runway expansion for the Hong Kong International Airport. Co-ordinates in red and marked with asterisk are revised co-ordinates of transect line.

2.1.5 Monitoring Schedule for the Reporting Period

The dolphin monitoring schedules for the reporting period are shown in *Appendix B*.

2.1.6 Results & Observations

A total of 845.36 km of survey effort was conducted, with 100% of the total survey effort being conducted under favourable weather conditions (ie Beaufort Sea State 3 or below with good visibility) in this reporting quarter. Amongst the two areas, 332.00 km and 513.36 km of survey effort were conducted from NEL and NWL survey areas, respectively. The total survey effort conducted on primary and secondary lines were 579.65 km and 265.71 km, respectively. The survey efforts are summarized in *Appendix C*.

A total of eight groups of eighteen Chinese White Dolphins sightings were recorded during the six sets of surveys in this reporting quarter. All dolphin sightings were made during on-effort search and all dolphin groups were made on primary lines. During this reporting quarter, all dolphin groups were sighted in NWL, while no dolphin was sighted in NEL.

Encounter rates of Chinese White Dolphins are deduced from the survey effort and on-effort sighting data made under favorable conditions (Beaufort 3 or below with good visibility) in the reporting quarter with the results and comparison with baseline results present in *Tables 2.3* and *2.4*.

Table 2.3 Individual Survey Event Encounter Rates

		Encounter rate (STG) (no. of on-effort dolphin sightings per 100 km of survey effort)	**Encounter rate (ANI)** (no. of dolphins from all on-effort sightings per 100 km of survey effort)
		Primary Lines Only	**Primary Lines Only**
NEL	Set 1 (2 & 3 Dec 2021)	0.00	0.00
	Set 2 (14 & 15 Dec 2021)	0.00	0.00
	Set 3 (3 & 4 Jan 2022)	0.00	0.00
	Set 4 (21 & 25 Jan 2022)	0.00	0.00
	Set 5 (10 & 11 Feb 2022)	0.00	0.00
	Set 6 (24 & 25 Feb 2022)	0.00	0.00
NWL	Set 1 (2 & 3 Dec 2021)	0.00	0.00
	Set 2 (14 & 15 Dec 2021)	0.00	0.00
	Set 3 (3 & 4 Jan 2022)	3.31	6.62

	Set 4 (21 & 25 Jan 2022)	1.61	1.61
	Set 5 (10 & 11 Feb 2022)	1.60	9.60
	Set 6 (24 & 25 Feb 2022)	3.28	3.28

Note: Dolphin Encounter Rates are deduced from the Three Sets of Surveys (Two Surveys in Each Set) in the reporting quarter in Northeast (NEL) and Northwest Lantau (NWL)

Table 2.4 Quarterly Average Encounter Rates

	Encounter rate (STG) (no. of on-effort dolphin sightings per 100 km of survey effort)		**Encounter rate (ANI) (no. of dolphins from all on-effort sightings per 100 km of survey effort)**	
	December 2021 – February 2022	**September – November 2011**	**December 2021 – February 2022**	**September – November 2011**
Northeast Lantau	0.0	6.00 ± 5.05	0.0	22.19 ± 26.81
Northwest Lantau	1.63 ± 1.47	9.85 ± 5.85	3.52 ± 3.87	44.66 ± 29.85

Note: Encounter rates deduced from the baseline monitoring period have been recalculated based only on survey effort and on-effort sighting data made along the primary transect lines under favourable conditions.

One limit level exceedance was observed for the quarterly dolphin monitoring data between December 2021 to February 2022.

2.2 ENVIRONMENTAL LICENSES AND PERMITS

The status of environmental licensing and permit is summarized in *Table 2.5* below.

Table 2.5 Summary of Environmental Licensing and Permit Status

License/ Permit	License or Permit No.	Date of Issue	Date of Expiry	License/ Permit Holder	Remarks
Environmental Permit	EP-354/2009/D	13 March 2015	Throughout the Contract	HyD	Application for VEP on 3 March 2015 to supersede EP-354/2009/C

Notes:
HyD = Highways Department
VEP = Variation of Environmental Permit

2.3 *SUMMARY OF EXCEEDANCES OF THE ENVIRONMENTAL QUALITY PERFORMANCE LIMIT*

One (1) Limit Level exceedance was observed for the quarterly dolphin monitoring data between December 2021 and February 2022.

Cumulative statistics are provided in *Appendix D*.

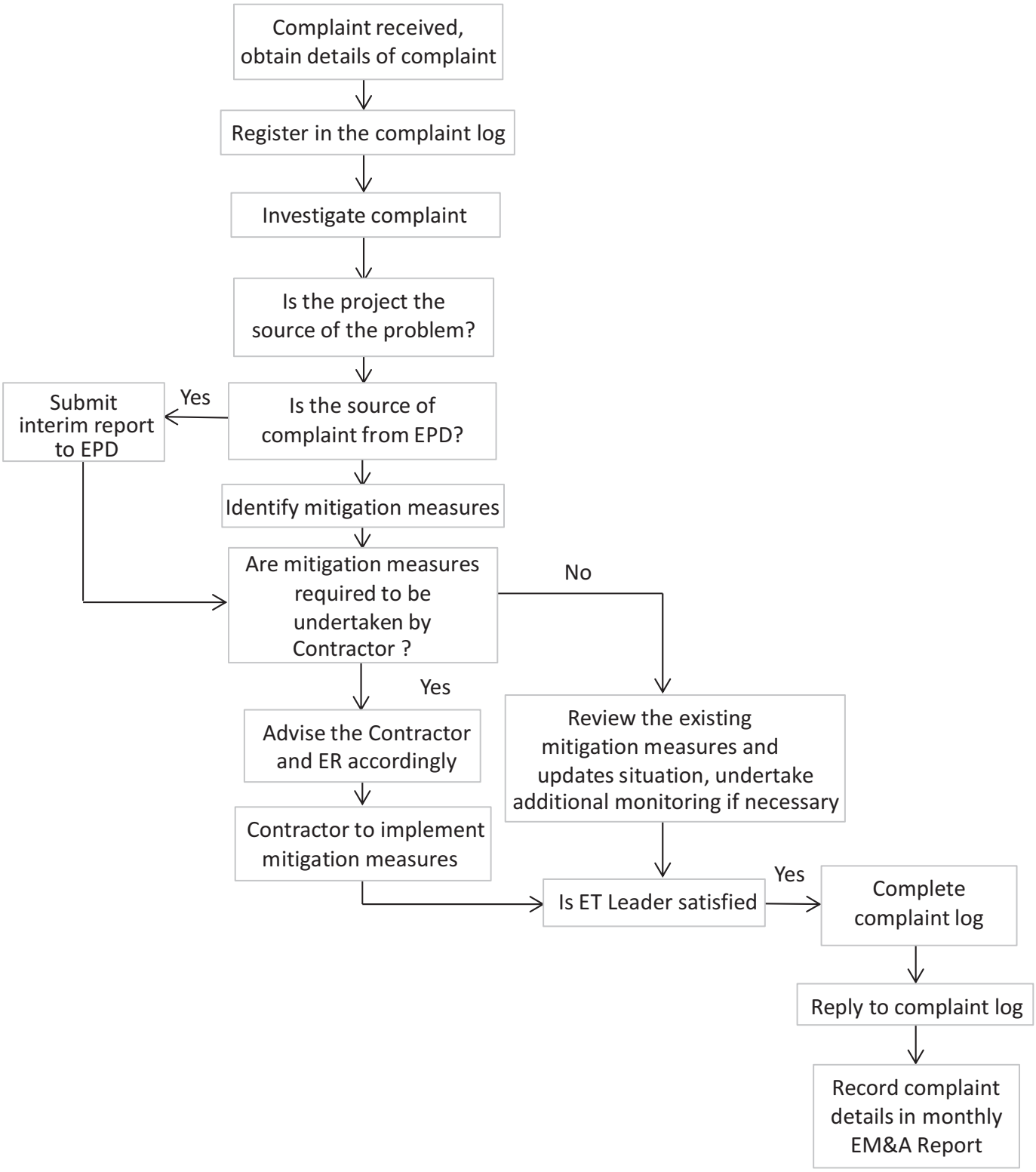
2.4 *SUMMARY OF COMPLAINTS, NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS*

The Environmental Complaint Handling Procedure is provided in *Figure 2.2*.

No environmental complaint was received in this reporting period.

No environmental summons was received in this reporting period.

Statistics on complaints, notifications of summons and successful prosecutions are summarized in *Appendix D*.



Environmental Complaint Handling Procedure

Figure 2.2

FILE: 0215660n2.cdr
DATE: 06/12/2013

Environmental Resources Management

ERM

3 FUTURE KEY ISSUES

3.1 MONITORING SCHEDULE FOR THE COMING QUARTER

Post construction (operational) phase dolphin monitoring is scheduled to continue for the next reporting period.

The monitoring programme has been reviewed and was considered as adequate to cater for the nature of works in progress. Change to the monitoring programme was thus not considered to be necessary at this stage. The monitoring programme will be evaluated as appropriate in the next reporting period.

4 CONCLUSIONS

This Second Quarterly EM&A Report presents the findings of the monitoring works undertaken during the period from 1 December 2021 to 28 February 2022, in accordance with the Updated EM&A Manual and the requirements of *EP-354/2009/D*.

Operational phase dolphin monitoring was carried out in this reporting month.

A total of eight groups of eighteen Chinese White Dolphins sightings were recorded during the six sets of surveys in this reporting quarter. All dolphin sightings were made during on-effort search and all dolphin groups were made on primary lines. One limit level exceedance was observed for the quarterly dolphin monitoring data between December 2021 and February 2022.

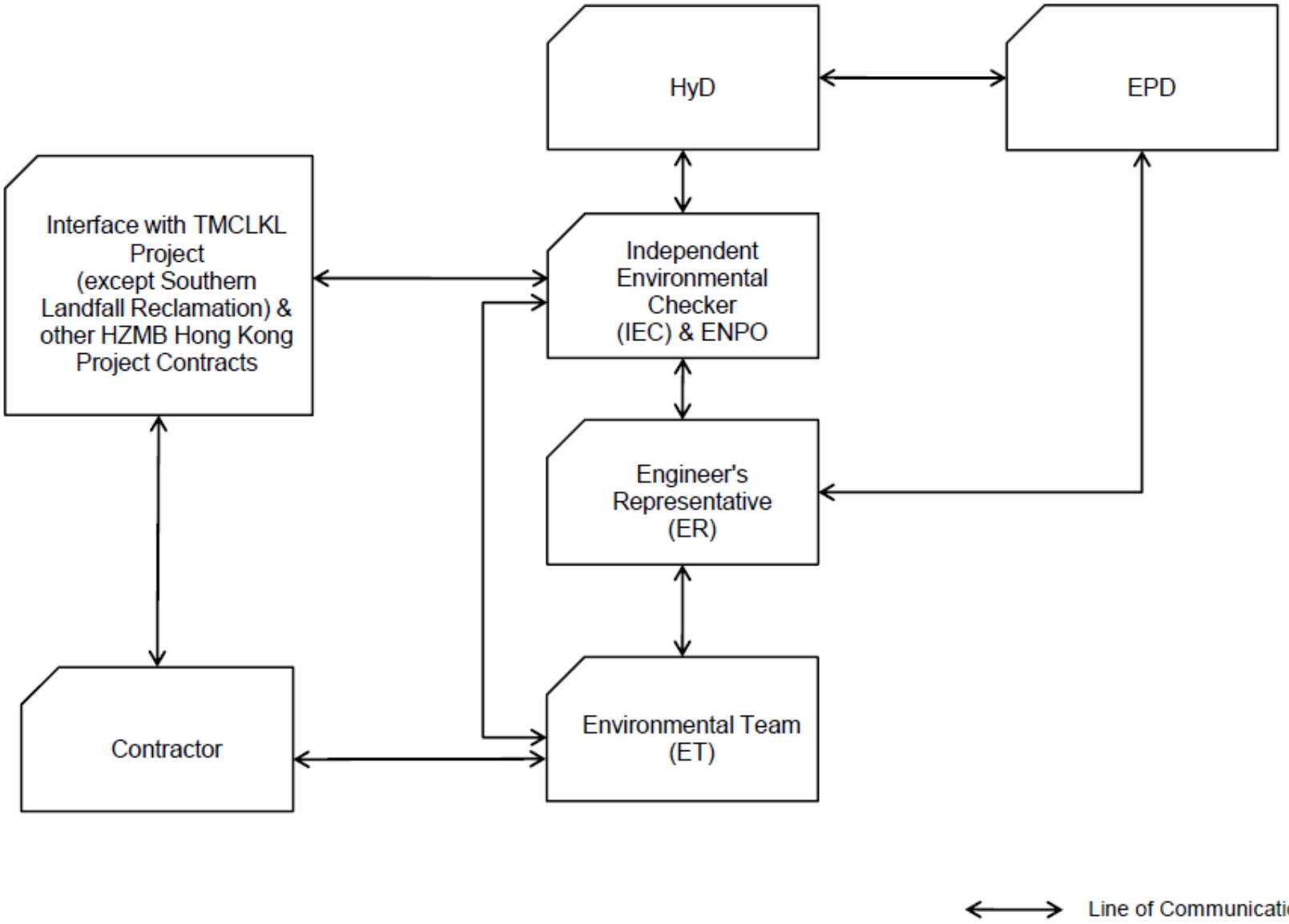
No environmental complaint was received in this reporting period.

No environmental summons was received in this reporting period.

In order to fulfil the EP's and EM&A Manual's requirements for TM-CLKL Project, *Agreement No. HMWSD 1/2021 (EP)* took over the responsibility for implementation of operational phase dolphin monitoring from *Contract No. HY/2012/08* from 1 September 2021 to 31 May 2022.

Appendix A

Project Organization for Environmental Works



Appendix A1

Contract No. HY/2012/08 Northern Connection Sub-sea Tunnel Section
Project Organization

DATE: 06/03/2013

Environmental Resources Management

ERM

Appendix B

EM&A Monitoring Schedules

Agreement No. HMWSD 1/2021 (EP) Post-Construction Monitoring of Chinese White Dolphin (Line-transect Vessel Surveys) for Tuen Mun – Chek Lap Kok Link in Northeast and Northwest Lantau Survey Area – Investigation
Tentative Operational Phase Dolphin Monitoring Survey Monitoring Schedule - December 2021

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			01-Dec	02-Dec	03-Dec	04-Dec
				Operational Phase Dolphin Monitoring	**Operational Phase Dolphin Monitoring**	
05-Dec	06-Dec	07-Dec	08-Dec	09-Dec	10-Dec	11-Dec
12-Dec	13-Dec	14-Dec	15-Dec	16-Dec	17-Dec	18-Dec
	Operational Phase Dolphin Monitoring	**Operational Phase Dolphin Monitoring**				
19-Dec	20-Dec	21-Dec	22-Dec	23-Dec	24-Dec	25-Dec
26-Dec	27-Dec	28-Dec	29-Dec	30-Dec	31-Dec	

Agreement No. HMWSD 1/2021 (EP) Post-Construction Monitoring of Chinese White Dolphin (Line-transect Vessel Surveys) for Tuen Mun – Chek Lap Kok Link in Northeast and Northwest Lantau Survey Area – Investigation
Operational Phase Dolphin Monitoring Survey Monitoring Schedule - January 2022

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						01-Jan
02-Jan	03-Jan	04-Jan	05-Jan	06-Jan	07-Jan	08-Jan
	Operational Phase Dolphin Monitoring	**Operational Phase Dolphin Monitoring**				
09-Jan	10-Jan	11-Jan	12-Jan	13-Jan	14-Jan	15-Jan
16-Jan	17-Jan	18-Jan	19-Jan	20-Jan	21-Jan	22-Jan
					Operational Phase Dolphin Monitoring	
23-Jan	24-Jan	25-Jan	26-Jan	27-Jan	28-Jan	29-Jan
		Operational Phase Dolphin Monitoring				
30-Jan	31-Jan					

Agreement No. HMWSD 1/2021 (EP) Post-Construction Monitoring of Chinese White Dolphin (Line-transect Vessel Surveys) for Tuen Mun – Chek Lap Kok Link in Northeast and Northwest Lantau Survey Area – Investigation
Tentative Operational Phase Dolphin Monitoring Survey Monitoring Schedule - February 2022

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		01-Feb	02-Feb	03-Feb	04-Feb	05-Feb
06-Feb	07-Feb	08-Feb	09-Feb	10-Feb	11-Feb	12-Feb
				Operational Phase Dolphin Monitoring	**Operational Phase Dolphin Monitoring**	
13-Feb	14-Feb	15-Feb	16-Feb	17-Feb	18-Feb	19-Feb
20-Feb	21-Feb	22-Feb	23-Feb	24-Feb	25-Feb	26-Feb
				Operational Phase Dolphin Monitoring	**Operational Phase Dolphin Monitoring**	
27-Feb	28-Feb					

Appendix C

Operational Phase Dolphin Monitoring Survey

AGREEMENT NO. HMWSD 1/2021 (EP)
Post-Construction Monitoring of Chinese White Dolphin for Hong Kong-Zhuhai-Macao Bridge Tuen Mun – Chek Lap Kok Link

Quarterly Progress Report (December 2021-February 2022)
submitted to ERM Hong Kong Ltd.

Submitted by
Hong Kong Cetacean Research Project

16 March 2022

1. Introduction

1.1. As part of the Hong Kong-Zhuhai-Macao Bridge (HZMB), the Tuen Mun-Chek Lap Kok Link (TMCLKL) is a designated project under the Environmental Impact Assessment Ordinance (EIAO). The Environmental Impact Assessment (EIA) Report and Environmental Monitoring and Audit (EM&A) Manual (EIA Register No.: AEIAR-146/2009) for the project were approved by the Director of Environmental Protection in October 2009 and the Environmental Permit No. EP-354/2009 (EP) was issued in November 2009. The EP has been subject to several variations and the current one is EP No. EP-354/2009/D.

1.2. The TMCLKL was constructed under two works contracts namely Contract No. HY/2012/07 (Southern Connection Viaduct Section) and Contract No. HY/2012/08 (North Connection Sub-sea Tunnel Section). In accordance with the EP, the Contractors of Contract No. HY/2012/07 and Contract No. HY/2012/08 have separately employed their own Environmental Team (ET) and ET Leader to conduct construction phase monitoring of Chinese White Dolphin (CWD) in the North Lantau (NL) waters, which included the Northeast Lantau (NEL) and Northwest Lantau (NWL) survey areas, following the requirements specified in the EM&A Manual and the relevant contract specifications of the two contracts.

1.3. In accordance with Section 6.1 of the EM&A Manual and the EP, an ecological monitoring and audit programme is needed to monitor potential impacts through construction and operation activities of TMCLKL. The construction and post-construction (operational) EM&A objectives are to ensure that the ecological contract works and construction mitigation procedures recommended in the EIA are carried out as specified and are effective. Post-construction phase EM&A will comprise the audit of the measures as appropriate. In order for such monitoring to be effective, it needs to be divided into three phases: pre-disturbance (i.e. baseline phase), the entire period of disturbance (i.e. construction phase) and post-disturbance after the completion of construction works (i.e. post-construction phase). Survey techniques must be held constant from phase to phase, and survey equipment and personnel should ideally be the

same as well.

1.4. The main objective of the current assignment commissioned by the Highways Department is to conduct the post-construction monitoring of CWD in NL waters in compliance with the requirements stipulated in the EM&A Manual and the EP for the TMCLKL works. Such monitoring should be conducted for two years upon the completion of all marine-based construction activities for the TMCLKL according to the EM&A Manual, which were completed in May 2020. From June 2020 to August 2021, 15 months of post-construction dolphin monitoring had been carried out by the ET / ET Leader appointed under Contract No. HY/2012/08, while the remaining nine months of post-construction dolphin monitoring will be completed under this assignment, from September 2021 to May 2022.

1.5. In August 2021, the ERM Hong Kong (ERMHK) Limited has been appointed as the Consultant responsible for the nine months of post-construction monitoring of CWD in NL waters for the TMCLKL. Subsequently, the Hong Kong Cetacean Research Project (HKCRP) has been appointed by ERMHK to collaborate and undertake the dolphin monitoring tasks to conduct systematic line-transect vessel surveys.

1.4. The present quarterly progress report is submitted to the Contractor under the TMCLKL post-construction phase dolphin monitoring programme, which summarizes the results of the survey findings during the period of December 2021 to February 2022.

2. Monitoring Methodology

2.1. Vessel-based Line-transect Survey

2.1.1. According to the requirement of the updated EM&A manual, dolphin monitoring programme should cover all transect lines in NEL and NWL survey areas (see Figure 1) twice per month throughout the entire construction and post-construction monitoring period. The co-ordinates of all transect lines are shown in Table 1.

Table 1 Co-ordinates of transect lines conducted by TMCLKL08 project

Line No.		Easting	Northing		Line No.		Easting	Northing
1	Start Point	804671	815456		13	Start Point	816506	819480
1	End Point	804671	831404		13	End Point	816506	824859
2	Start Point	805476	820800		14	Start Point	817537	820220
2	End Point	805476	826654		14	End Point	817537	824613
3	Start Point	806464	821150		15	Start Point	818568	820735
3	End Point	806464	822911		15	End Point	818568	824433
4	Start Point	807518	821500		16	Start Point	819532	821420
4	End Point	807518	829230		16	End Point	819532	824209

5	Start Point	808504	821850		17	Start Point	820451	822125
5	End Point	808504	828602		17	End Point	820451	823671
6	Start Point	809490	822150		18	Start Point	821504	822371
6	End Point	809490	825352		18	End Point	821504	823761
7	Start Point	810499	822000		19	Start Point	822513	823268
7	End Point	810499	824613		19	End Point	822513	824321
8	Start Point	811508	821123		20	Start Point	823477	823402
8	End Point	811508	824254		20	End Point	823477	824613
9	Start Point	812516	821303		21	Start Point	805476	827081
9	End Point	812516	824254		21	End Point	805476	830562
10	Start Point	813525	821176		22	Start Point	806464	824033
10	End Point	813525	824657		22	End Point	806464	829598
11	Start Point	814556	818853		23	Start Point	814559	821739
11	End Point	814556	820992		23	End Point	814559	824768
12	Start Point	815542	818807		24	Start Point	805476	815900
12	End Point	815542	824882		24	End Point	805476	819100

2.1.2. The TMCLKL survey team used standard line-transect methods (Buckland et al. 2001) to conduct the systematic vessel surveys, and followed the same technique of data collection that has been adopted over the last 22 years of marine mammal monitoring surveys in Hong Kong developed by HKCRP (see Hung 2020). For each monitoring vessel survey, a 15-m inboard vessel with an open upper deck (about 4.5 m above water surface) was used to make observations from the flying bridge area.

2.1.3. Two experienced observers (a data recorder and a primary observer) made up the on-effort survey team, and the survey vessel transited different transect lines at a constant speed of 13-15 km per hour. The data recorder searched with unaided eyes and filled out the datasheets, while the primary observer searched for dolphins and porpoises continuously through 7 x 50 *Fujinon* marine binoculars. Both observers searched the sea ahead of the vessel, between 270^{o} and 90^{o} (in relation to the bow, which is defined as 0^{o}). One to two additional experienced observers were available on the boat to work in shift (i.e. rotate every 30 minutes) in order to minimize fatigue of the survey team members. All observers were experienced in small cetacean survey techniques and identifying local cetacean species.

2.1.4. During on-effort survey periods, the survey team recorded effort data including time, positions (latitude and longitude), weather conditions (Beaufort sea state and visibility), and distance traveled in each series (a continuous period of search effort) with the assistance of a handheld GPS (*Garmin eTrex Legend*).

2.1.5. Data including time, position and vessel speed were also automatically and continuously

logged by handheld GPS throughout the entire survey for subsequent review.

2.1.6. When dolphins were sighted, the survey team would end the survey effort, and immediately record the initial sighting distance and angle of the dolphin group from the survey vessel, as well as the sighting time and position. Then the research vessel was diverted from its course to approach the animals for species identification, group size estimation, assessment of group composition, and behavioural observations. The perpendicular distance (PSD) of the dolphin group to the transect line was later calculated from the initial sighting distance and angle.

2.1.7. Survey effort being conducted along the parallel transect lines that were perpendicular to the coastlines (as indicated in Figure 1) was labeled as "primary" survey effort, while the survey effort conducted along the connecting lines between parallel lines was labeled as "secondary" survey effort. According to HKCRP long-term dolphin monitoring data, encounter rates of Chinese white dolphins deduced from effort and sighting data collected along primary and secondary lines were similar in NEL and NWL survey areas. Therefore, both primary and secondary survey effort were presented as on-effort survey effort in this report.

2.2. Photo-identification Work

2.2.1. When a group of Chinese White Dolphins were sighted during the line-transect survey, the TMCLKL survey team would end effort and approach the group slowly from the side and behind to take photographs of them. Every attempt was made to photograph every dolphin in the group, and even photograph both sides of the dolphins, since the colouration and markings on both sides may not be symmetrical.

2.2.2. A professional digital camera (*Canon* EOS 7D model), equipped with long telephoto lenses (100-400 mm zoom), were available on board for researchers to take sharp, close-up photographs of dolphins as they surfaced. The images were shot at the highest available resolution and stored on Compact Flash memory cards for downloading onto a computer.

2.2.3. All digital images taken in the field were first examined, and those containing potentially identifiable individuals were sorted out. These photographs would then be examined in greater detail, and were carefully compared to the existing Chinese White Dolphin photo-identification catalogue maintained by HKCRP since 1995.

2.2.4. Chinese White Dolphins can be identified by their natural markings, such as nicks, cuts, scars and deformities on their dorsal fin and body, and their unique spotting patterns were also used as secondary identifying features (Jefferson 2000).

2.2.5. All photographs of each individual were then compiled and arranged in chronological order, with data including the date and location first identified (initial sighting), re-sightings, associated dolphins, distinctive features, and age classes entered into a computer database.

2.3. Data Analysis

2.3.1. Distribution Analysis – The line-transect survey data was integrated with the Geographic Information System (GIS) in order to visualize and interpret different spatial and temporal patterns of dolphin distribution using sighting positions. Location data of dolphin groups were plotted on map layers of Hong Kong using a desktop GIS (ArcView© 3.1) to examine their distribution patterns in details. The dataset was also stratified into different subsets to examine distribution patterns of dolphin groups with different categories of group sizes, young calves and activities.

2.3.2. Encounter rate analysis – Encounter rates of Chinese white dolphins (number of on-effort sightings per 100 km of survey effort, and total number of dolphins sighted on-effort per 100 km of survey effort) were calculated in NEL and NWL survey areas in relation to the amount of survey effort conducted during each month of monitoring survey. Only data collect under Beaufort 3 or below condition would be used for the encounter rate analyses. Dolphin encounter rates were calculated in two ways for comparisons with the HZMB baseline monitoring results as well as to AFCD long-term marine mammal monitoring results.

Firstly, for the comparison with the HZMB baseline monitoring results, the encounter rates were calculated using primary survey effort alone. The average encounter rate of sightings (STG) and average encounter rate of dolphins (ANI) were deduced based on the encounter rates from six events during the present quarter (i.e. six sets of line-transect surveys in North Lantau), which was also compared with the one deduced from the six events during the baseline period (i.e. six sets of line-transect surveys in North Lantau).

Secondly, the encounter rates were calculated using both primary and secondary survey effort collected under Beaufort 3 or below condition as in AFCD long-term monitoring study. The encounter rate of sightings and dolphins were deduced by dividing the total number of on-effort sightings (STG) and total number of dolphins (ANI) by the amount of survey effort for the present quarterly period.

2.3.3. Quantitative grid analysis on habitat use – To conduct quantitative grid analysis of habitat use, positions of on-effort sightings of Chinese White Dolphins collected during the quarterly monitoring period were plotted onto 1-km^2 grids among NWL and NEL survey areas on GIS. Sighting densities (number of on-effort sightings per km^2) and dolphin densities (total number of dolphins from on-effort sightings per km^2) were then calculated for each 1 km by 1 km grid with the aid of GIS.

Sighting density grids and dolphin density grids were then further normalized with the amount of survey effort conducted within each grid. The total amount of survey effort spent on each grid was calculated by examining the survey coverage on each line-transect survey to determine how many times the grid was surveyed during the study period. For example, when the survey boat traversed through a specific grid 50 times, 50 units of survey effort were counted for that grid. With the amount of survey effort calculated for each grid, the sighting density and dolphin density of each grid were then normalized (i.e. divided by the unit of survey effort).

The newly-derived unit for sighting density was termed SPSE, representing the number of on-effort **s**ightings **p**er 100 units of **s**urvey **e**ffort. In addition, the derived unit for actual dolphin density was termed DPSE, representing the number of **d**olphins **p**er 100 units of **s**urvey **e**ffort. Among the 1-km^2 grids that were partially covered by land, the percentage of sea area was calculated using GIS tools, and their SPSE and DPSE values were adjusted accordingly. The following formulae were used to estimate SPSE and DPSE in each 1-km^2 grid within the study area:

$$SPSE = ((S / E) \times 100) / SA\%$$
$$DPSE = ((D / E) \times 100) / SA\%$$

where S = total number of on-effort sightings
D = total number of dolphins from on-effort sightings
E = total number of units of survey effort
SA% = percentage of sea area

2.3.4. Behavioural analysis – When dolphins were sighted during vessel surveys, their behaviour was observed. Different activities were categorized (i.e. feeding, socializing, traveling, and milling/resting) and recorded on sighting datasheets. This data was then input into a separate database with sighting information, which can be used to determine the distribution of behavioural data with a desktop GIS. Distribution of sightings of dolphins engaged in different activities and behaviours would then be plotted on GIS and carefully examined to identify important areas for different activities of the dolphins.

2.3.5. Ranging pattern analysis – Location data of individual dolphins that occurred during the 3-month post-construction phase monitoring period were obtained from the dolphin sighting database and photo-identification catalogue. To deduce home ranges for individual dolphins using the fixed kernel methods, the program Animal Movement Analyst Extension, was loaded as an extension with ArcView© 3.1 along with another extension Spatial Analyst 2.0. Using the fixed kernel method, the program calculated kernel density estimates based on all sighting positions, and provided an active interface to display kernel density plots. The kernel estimator then calculated and displayed the overall ranging area at 95% UD level.

3. Monitoring Results

3.1. Summary of survey effort and dolphin sightings

3.1.1. During the period of December 2021 to February 2022, six sets of systematic line-transect vessel surveys were conducted under the TMCLKL post-construction dolphin monitoring works to cover all transect lines in NWL and NEL survey areas twice per month.

3.1.2. From these surveys, a total of 845.36 km of survey effort was collected, with 100% of the total survey effort being conducted under favourable weather conditions (i.e. Beaufort Sea State 3 or below with good visibility). Among the two areas, 332.00 km and 513.36 km of survey effort were conducted in NEL and NWL survey areas respectively.

3.1.3. The total survey effort conducted on primary lines was 579.65 km, while the effort on secondary lines was 265.71 km. Survey effort conducted on both primary and secondary lines were considered to be on-effort survey data. A summary table of the survey effort is shown in Appendix I.

3.1.4. During the six sets of TMCLKL monitoring surveys from December 2021 to February 2022, a total of eight groups of 18 Chinese White Dolphins were sighted. All dolphin sightings were made during on-effort search, and six of the eight sightings were made on primary lines in this quarter. A summary table of dolphin sightings is shown in Appendix II.

3.1.5. In this quarterly period, all dolphin groups were sighted in NWL, and no dolphin was sighted at all in NEL. In fact, since August 2014, only two sightings of two lone dolphins were made respectively in NEL during the HKLR/TMCLKL monitoring surveys.

3.2. Distribution

3.2.1. Distribution of dolphin sightings made during the TMCLKL monitoring surveys from December 2021 to February 2022 is shown in Figure 1. The majority of sightings were concentrated to the north and south of Lung Kwu Chau, while a few groups were also sighted to the east of Sha Chau and to the west of Shum Wat. As consistently recorded in previous monitoring quarters in recent years, the dolphins were completely absent from the central and eastern portions of North Lantau waters.

3.2.2. Notably, all dolphin groups were sighted far away from the TMCLKL alignment as well as the HKBCF and HKLR03 reclamation sites during the quarterly period (Figure 1). However, one sighting was made very close to the HKLR09 alignment at the southwest corner of the NWL survey area.

3.2.3. Sighting distribution of dolphins during the present post-construction monitoring period was drastically different from the one during the baseline monitoring period (Figure 1). In the present quarter, dolphins have disappeared from the NEL region, which was in stark contrast to their frequent occurrence around the Brothers Islands, near Shum Shui Kok and in the vicinity of HKBCF reclamation site during the baseline period (Figure 1). The nearly complete abandonment of NEL region by the dolphins has been consistently recorded in the past eight years of HZMB-related dolphin monitoring, which has resulted in zero to extremely low encounter rates in this area.

3.2.4. In NWL survey area, dolphin occurrences were also drastically different between the baseline and the present post-construction monitoring periods. During the present quarter, dolphins were seldom sighted here, and only at the western end of the North Lantau region. This was in contrary to their frequent occurrences throughout the area during the baseline period (Figure 1).

3.2.5. Another comparison in dolphin distribution was made between the six quarterly periods of winter months in 2016-22 (Figure 2). Across the six winter periods, the majority of dolphin sightings were made consistently at the western end of the North Lantau region,

and the dolphins were also consistently absent from the NEL survey area (Figure 2).

3.3. Encounter rate

3.3.1. During the present quarterly period, the encounter rates of Chinese White Dolphins deduced from the survey effort and on-effort sighting data from the primary transect lines under favourable conditions (Beaufort 3 or below) for each set of the TMCLKL surveys in NEL and NWL are shown in Table 2. The average encounter rates deduced from the six sets of surveys were also compared with the ones deduced from the baseline monitoring period (September-November 2011) (Table 3).

Table 2. Dolphin encounter rates (sightings per 100 km of survey effort) during December 2021-February 2022

SURVEY AREA	DOLPHIN MONITORING DATES	Encounter rate (STG) (no. of on-effort dolphin sightings per 100 km of survey effort)	Encounter rate (ANI) (no. of dolphins from all on-effort sightings per 100 km of survey effort)
		Primary Lines Only	Primary Lines Only
Northeast Lantau	Set 1 (2 & 3 Dec 2021)	0.00	0.00
	Set 2 (14 & 15 Dec 2021)	0.00	0.00
	Set 3 (3 & 4 Jan 2022)	0.00	0.00
	Set 4 (21 & 25 Jan 2022)	0.00	0.00
	Set 5 (10 & 11 Feb 2022)	0.00	0.00
	Set 6 (24 & 25 Feb 2022)	0.00	0.00
Northwest Lantau	Set 1 (2 & 3 Dec 2021)	0.00	0.00
	Set 2 (14 & 15 Dec 2021)	0.00	0.00
	Set 3 (3 & 4 Jan 2022)	3.31	6.62
	Set 4 (21 & 25 Jan 2022)	1.61	1.61
	Set 5 (10 & 11 Feb 2022)	1.60	9.60
	Set 6 (24 & 25 Feb 2022)	3.28	3.28

Table 3. Comparison of average dolphin encounter rates from the present post-construction monitoring period (December 2021-February 2022) and baseline monitoring period (September-November 2011) (Note: encounter rates deduced from the baseline monitoring period have been recalculated based only on survey effort and on-effort sighting data made along the primary transect lines under favourable conditions; ± denotes the standard deviation of the average encounter rates)

	Encounter rate (STG) (no. of on-effort dolphin sightings per 100 km of survey effort)		Encounter rate (ANI) (no. of dolphins from all on-effort sightings per 100 km of survey effort)	
	December 2021 – February 2022	September – November 2011	December 2021 – February 2022	September – November 2011
Northeast Lantau	0.0	6.00 ± 5.05	0.0	22.19 ± 26.81
Northwest Lantau	1.63 ± 1.47	9.85 ± 5.85	3.52 ± 3.87	44.66 ± 29.85

3.3.2. To facilitate the comparison with the AFCD long-term monitoring results, the encounter rates were also calculated for the present quarter using both primary and secondary survey effort. The encounter rates of sightings (STG) and dolphins (ANI) in NWL were 1.56 sightings and 3.51 dolphins per 100 km of survey effort respectively, while the encounter rates of sightings (STG) and dolphins (ANI) in NEL were both nil for this quarter.

3.3.3 In NEL, the average dolphin encounter rates (both STG and ANI) in the present quarterly post-construction monitoring period were both zero with no on-effort sighting being made, and such extremely low occurrence of dolphins in NEL have been consistently recorded during the same winter quarters throughout the HKLR/TMCLKL dolphin monitoring in the past nine consecutive years (Table 4).

Table 4. Comparison of average dolphin encounter rates in NEL survey area from the same winter quarters of HKLR/TMCLKL impact and post-construction monitoring periods since 2012 and the baseline monitoring period (September-November 2011) (Note: encounter rates deduced from the baseline monitoring period have been recalculated based only on survey effort and on-effort sighting data made along the primary transect lines under favourable conditions; ± denotes the standard deviation of the average encounter rates)

	Encounter rate (STG) (no. of on-effort dolphin sightings per 100 km of survey effort)	**Encounter rate (ANI)** (no. of dolphins from all on-effort sightings per 100 km of survey effort)
September-November 2011 (Baseline)	6.00 ± 5.05	22.19 ± 26.81
December 2012-February 2013 (Impact)	3.14 ± 3.21	6.33 ± 8.64
December 2013-February 2014 (Impact)	0.45 ± 1.10	1.34 ± 3.29
December 2014-February 2015 (Impact)	0.00	0.00
December 2015-February 2016 (Impact)	0.00	0.00
December 2016-February 2017 (Impact)	0.00	0.00
December 2017-February 2018 (Impact)	0.00	0.00
December 2018-February 2019 (Impact)	0.00	0.00
December 2019-February 2020 (Impact)	0.00	0.00
December 2020-February 2021 (Post-Construction)	0.00	0.00
December 2021-February 2022 (Post-Construction)	0.00	0.00

3.3.4. On the other hand, the average dolphin encounter rates (STG and ANI) in NWL during the present quarterly period were only small fractions of the ones recorded during the three-month baseline period (with reductions of 83.5% and 92.1% respectively), indicating a dramatic decline in dolphin usage of this survey area during the present quarterly period as compared to the baseline period in 2011 (Table 5).

3.3.5. When comparing to the past nine winter quarters in 2012-21, both quarterly encounter rates in 2021-22 (STG and ANI) dropped to the lowest level among all winter quarters during the HKLR/TMCLKL monitoring period (Table 5). Such dramatic drop in dolphin occurrence in NWL raises serious concerns, and the temporal trend should be

continuously monitored while all construction activities of HZMB works have already been completed.

Table 5. Comparison of average dolphin encounter rates in Northwest Lantau survey area from the same winter quarters of HKLR/TMCLKL impact and post-construction monitoring periods since 2012 and the baseline monitoring period (September- November 2011) (Note: encounter rates deduced from the baseline monitoring period have been recalculated based only on survey effort and on-effort sighting data made along the primary transect lines under favourable conditions; ± denotes the standard deviation of the average encounter rates)

	Encounter rate (STG) (no. of on-effort dolphin sightings per 100 km of survey effort)	**Encounter rate (ANI)** (no. of dolphins from all on-effort sightings per 100 km of survey effort)
September-November 2011 (Baseline)	9.85 ± 5.85	44.66 ± 29.85
December 2012-February 2013 (Impact)	8.36 ± 5.03	35.90 ± 23.10
December 2013-February 2014 (Impact)	8.21 ± 2.21	32.58 ± 11.21
December 2014-February 2015 (Impact)	2.91 ± 2.69	11.27 ± 15.19
December 2015-February 2016 (Impact)	2.64 ± 1.52	10.98 ± 3.81
December 2016-February 2017 (Impact)	3.80 ± 3.79	14.52 ± 17.21
December 2017-February 2018 (Impact)	4.75 ± 2.26	15.73 ± 15.94
December 2018-February 2019 (Impact)	2.40 ± 1.88	7.95 ± 6.60
December 2019-February 2020 (Impact)	1.96 ± 2.23	8.15 ± 10.85
December 2020-February 2021 (Post-Construction)	3.01 ± 2.83	8.47 ± 9.07
December 2021-February 2022 (Post-Construction)	1.63 ± 1.47	3.52 ± 3.87

3.3.6. A two-way ANOVA with repeated measures and unequal sample size was conducted to examine whether there were any significant differences in the average encounter rates between the baseline and HKLR/TMCLKL monitoring periods. The two variables that were examined included the two periods (baseline and post-construction phases) and two locations (NEL and NWL).

3.3.7. For the comparison between the baseline period and the present quarter (the seventh quarter of the TMCLKL post-construction monitoring period being assessed), the p-values for the differences in average dolphin encounter rates of STG and ANI were 0.0031 and 0.0113 respectively. If the alpha value is set at 0.05, significant differences were detected between the baseline period and present quarter in both the average dolphin encounter rates of STG and ANI.

3.3.8. For the comparison between the baseline period and the cumulative quarters of the HKLR/TMCLKL monitoring period (i.e. the first 37 quarters of the impact and post-construction phases being assessed), the p-values for the differences in average dolphin encounter rates of STG and ANI were both 0.000000. Even if the alpha value is set at 0.00001, significant differences were still detected in both the average dolphin

encounter rates of STG and ANI (i.e. between the cumulative periods and the locations).

3.3.9. As indicated in both dolphin distribution patterns and encounter rates, dolphin usage has been significantly and dramatically reduced in both NEL and NWL survey areas during the present quarterly period, and such low occurrence of dolphins has also been consistently documented throughout the HKLR/TMCLKL monitoring period.

3.3.10. Even though all marine works associated with the HZMB construction have already been completed, and the Brothers Marine Park has been established as a compensation measure for the permanent habitat loss in association with the HZMB reclamation works since late 2016, apparently there has been no sign of recovery of dolphin usage in North Lantau waters at all, while such usage has continued to diminish to the lowest level.

3.4. Group size

3.4.1. Group sizes of the eight Chinese White Dolphin sightings ranged from singletons to six animals during December 2021 to February 2022. The average dolphin group sizes from these three months were compared with the ones deduced from the baseline period in September to November 2011, as shown in Table 6.

Table 6. Comparison of average dolphin group sizes from the present post-construction monitoring period (December 2021-February 2022) and baseline monitoring period (September – November 2011) (Note: ± denotes the standard deviation of the average group size)

	Average Dolphin Group Size	
	December 2021 – February 2022	**September – November 2011**
Overall	2.25 ± 1.83 (n = 8)	3.72 ± 3.13 (n = 66)
Northeast Lantau	---	3.18 ± 2.16 (n = 17)
Northwest Lantau	2.25 ± 1.83 (n = 8)	3.92 ± 3.40 (n = 49)

3.4.2. The average dolphin group size in NWL waters during the present quarter was lower than the one recorded during the three-month baseline period, but it should also be noted that the sample size of only eight dolphin groups in the present quarter was only a small fraction of the 66 dolphin groups sighted during the baseline period (Table 6).

3.4.3. Notably, six of the eight dolphin groups were very small with 1-2 individuals per group only, but there was also one medium-sized group of six dolphins (Appendix II). This larger group of dolphins was sighted just to the east of Sha Chau (Figure 3). This is in stark contrast to the baseline period when the larger groups were frequently sighted and evenly distributed throughout NWL waters, with a few also sighted in NEL waters (Figure 3).

3.5. Habitat use

3.5.1. From December 2021 to February 2022, there were a total of eight grids in North Lantau waters that have recorded dolphin occurrences. Among these, only two grids recorded moderately high dolphin densities and they were located to the northwest and east of Sha Chau, respectively (Figures 3a and 3b). Notably, all grids near TMCLKL alignment did

not record any presence of dolphins at all during on-effort search in the present quarterly period (Figures 3a and 3b).

3.5.2. It should be emphasized that the amount of survey effort collected in each grid during the three-month period was fairly low (6-12 units of survey effort for most grids), and therefore the habitat use pattern derived from the three-month dataset should be treated with caution.

3.5.3. When compared with the habitat use patterns during the baseline period, dolphin usage in NEL and NWL has drastically diminished in both areas during the present post-construction monitoring period (Figure 4). During the baseline period, many grids between Siu Mo To and Shum Shui Kok in NEL recorded moderately high to high dolphin densities, which was in stark contrast to the complete absence of dolphins there during the present quarter (Figure 4).

3.5.4. The density patterns were also very different in NWL between the baseline and present post-construction monitoring periods, with high dolphin usage throughout the area, especially around Sha Chau, near Black Point, to the west of the airport, as well as between Pillar Point and airport platform during the baseline period. In contrast, all grids with dolphin records during the present quarter were distributed at the western end of the NWL survey area, with the majority of them recorded low dolphin densities (Figure 4).

3.6. Mother-calf pairs

3.6.1. During the present quarterly period, no mother-calf pair was sighted.

3.7. Activities and associations with fishing boats

3.7.1. From December 2021 to February 2022, only one of the eight dolphin group was engaged in feeding activity, which was located to the east of Sha Chau (Figure 6). On the contrary, none of the groups was engaged in socializing, traveling or milling/resting activities.

3.7.2. Notably, none of the eight dolphin groups was found to be associated with any operating fishing vessel during this post-construction monitoring period.

3.8. Summary of photo-identification works

3.8.1. About 1,500 digital photographs of Chinese White Dolphins were taken during the present post-construction monitoring period for the photo-identification work.

3.8.2. In total, 11 individuals sighted 16 times altogether were identified (see summary table in Appendix III and photographs of identified individuals in Appendix IV). All re-sightings of these individual dolphins were made in NWL.

3.8.3. Seven of the 11 individuals were re-sighted only once, while another three individuals (NL37, WL79 and WL179) were re-sighted twice and one individual (NL123) was re-sighted thrice during the quarterly period (Appendix III).

3.9. Individual range use

3.9.1. Ranging patterns of the 11 individuals identified during the present quarterly period were determined by fixed kernel method, and are shown in Appendix V.

3.9.2. All identified dolphins sighted in the present quarter were utilizing NWL waters only, but have completely avoided NEL waters where many of them have utilized as their core areas in the past (Appendix V). This is in contrary to the extensive movements between NEL and NWL survey areas observed in the earlier impact monitoring quarters as well as the baseline period.

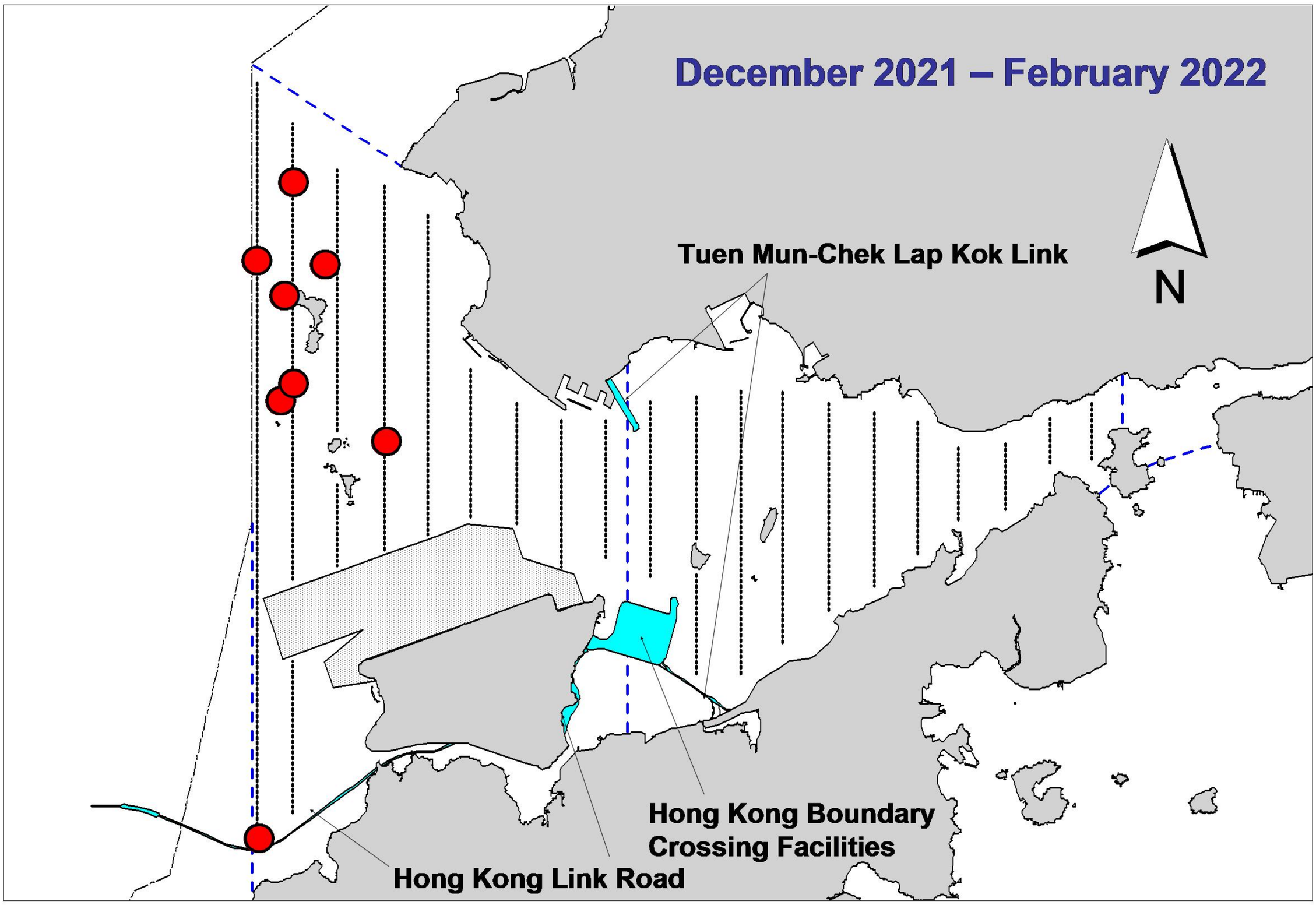
3.9.3. Notably, six of the 11 individuals have primarily centered their range use in North Lantau waters in the past, and were still re-sighted within their normal ranges during this quarterly period. On the contrary, the primary ranges of three individuals (WL79, WL154 and WL294) were in West Lantau waters in the past, but have extended to NWL waters during the present quarterly period (Appendix V).

4. References

- Buckland, S. T., Anderson, D. R., Burnham, K. P., Laake, J. L., Borchers, D. L., and Thomas, L. 2001. Introduction to distance sampling: estimating abundance of biological populations. Oxford University Press, London.

- Hung, S. K. 2020. Monitoring of marine mammals in Hong Kong waters – data collection: final report (2019-20). An unpublished report submitted to the Agriculture, Fisheries and Conservation Department of Hong Kong SAR Government, 138 pp.

- Jefferson, T. A. 2000. Population biology of the Indo-Pacific hump-backed dolphin in Hong Kong waters. Wildlife Monographs 144:1-65.



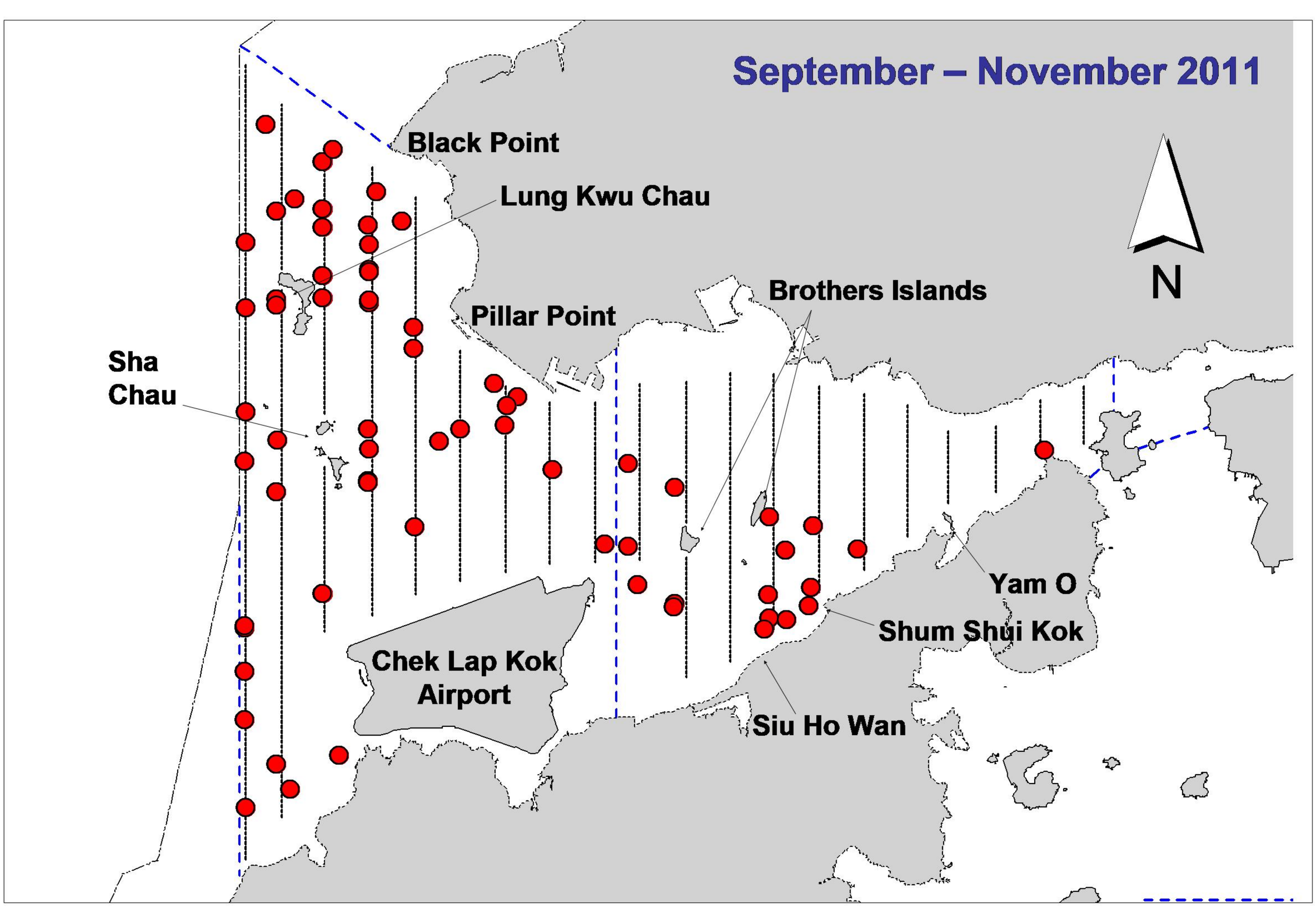


Figure 1. Distribution of Chinese white dolphin sighting in Northwest and Northeast Lantau during the present TMCLKL monitoring period (top) and baseline period (bottom)

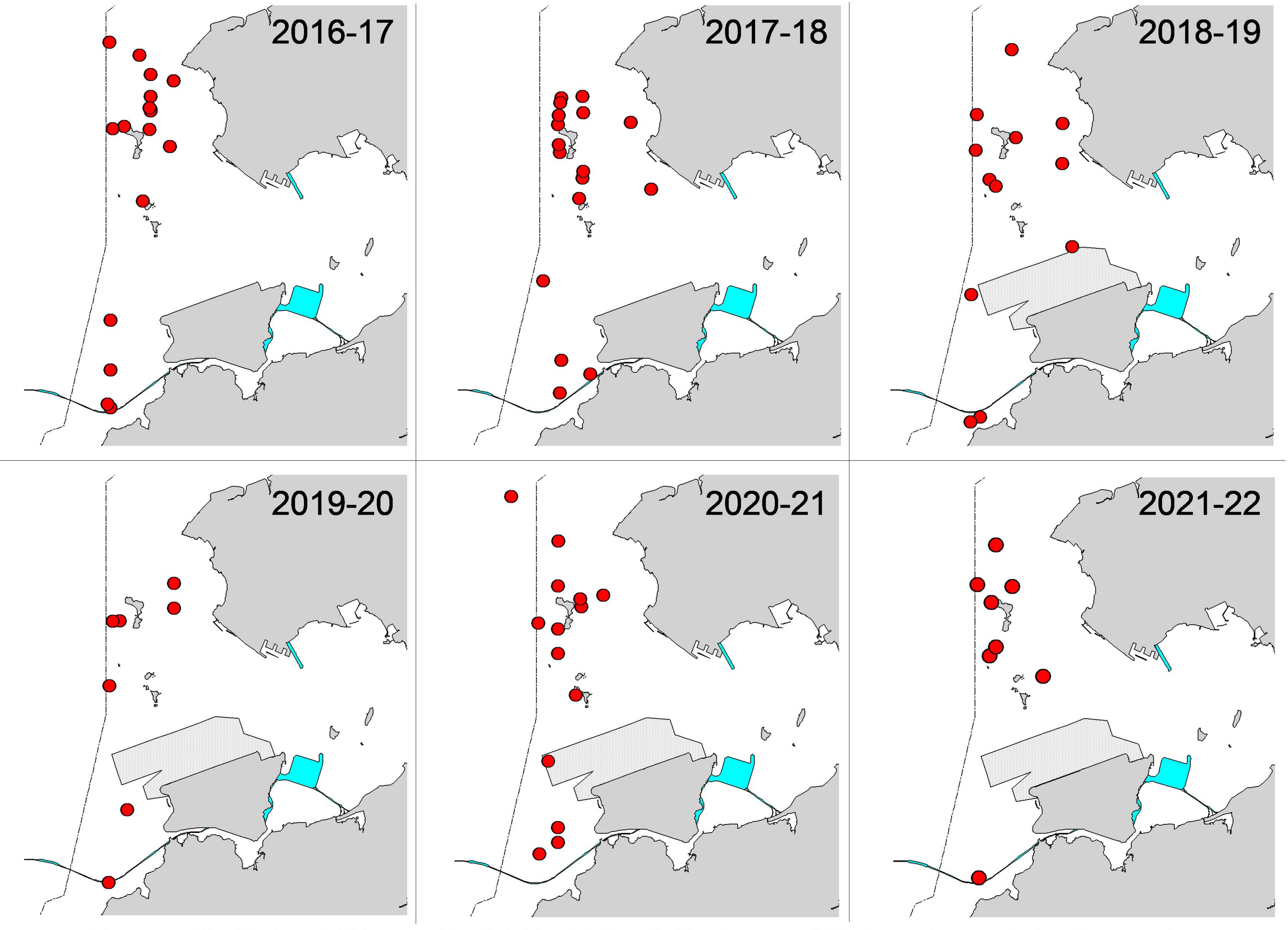


Figure 2. Distribution of Chinese white dolphin sightings in Northwest and Northeast Lantau during the past six winter quarters (December-February) of HKLR03/TMCLKL monitoring in 2016-22

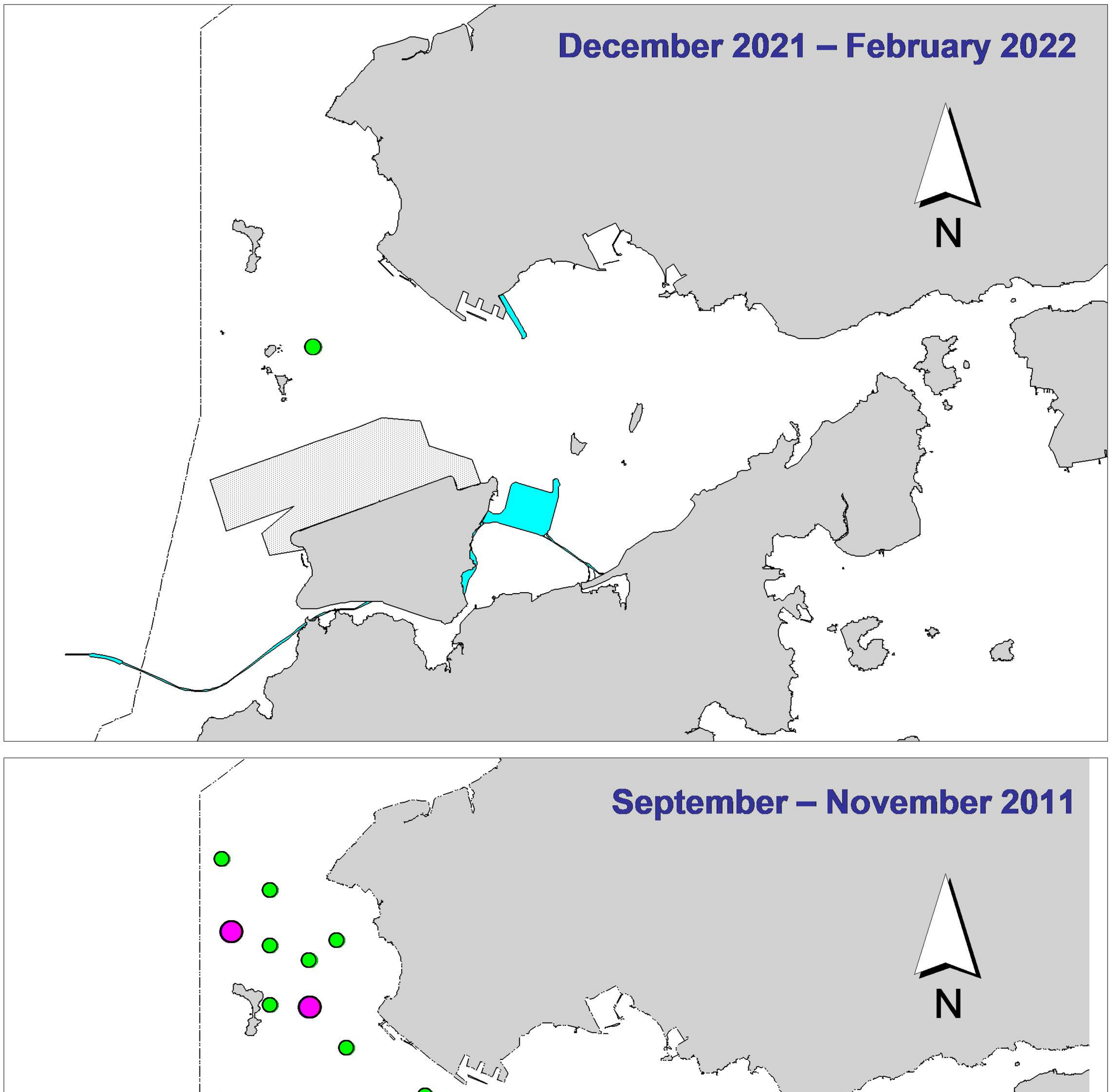


Figure 3. Distribution of Chinese white dolphins with larger group sizes during the present TMCLKL monitoring period (top) and baseline period (bottom) (green dots: group sizes of 5 or more; purple dots: group sizes of 10 or more)

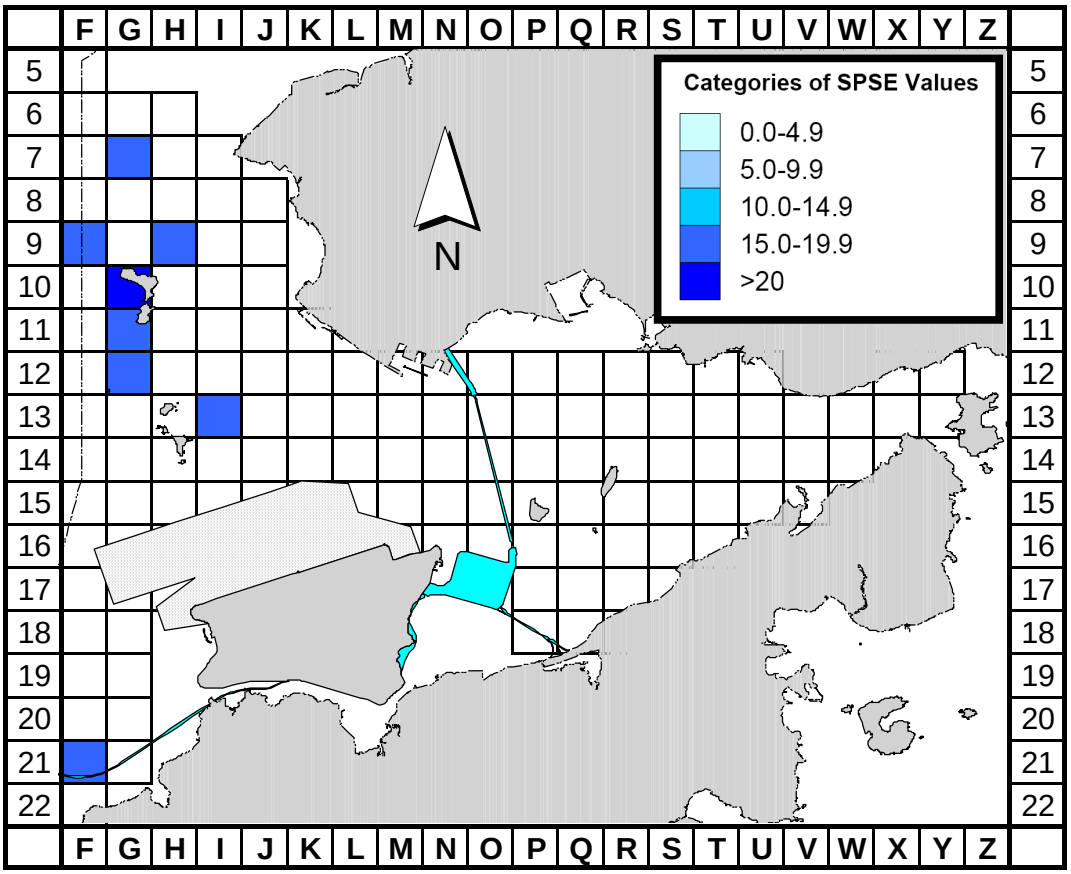


Figure 4a. Sighting density of Chinese white dolphins with corrected survey effort per km^2 in Northeast and Northwest Lantau survey areas, using data collected during present TMCLKL monitoring period (December 2021-February 2022) (SPSE = no. of on-effort sightings per 100 units of survey effort)

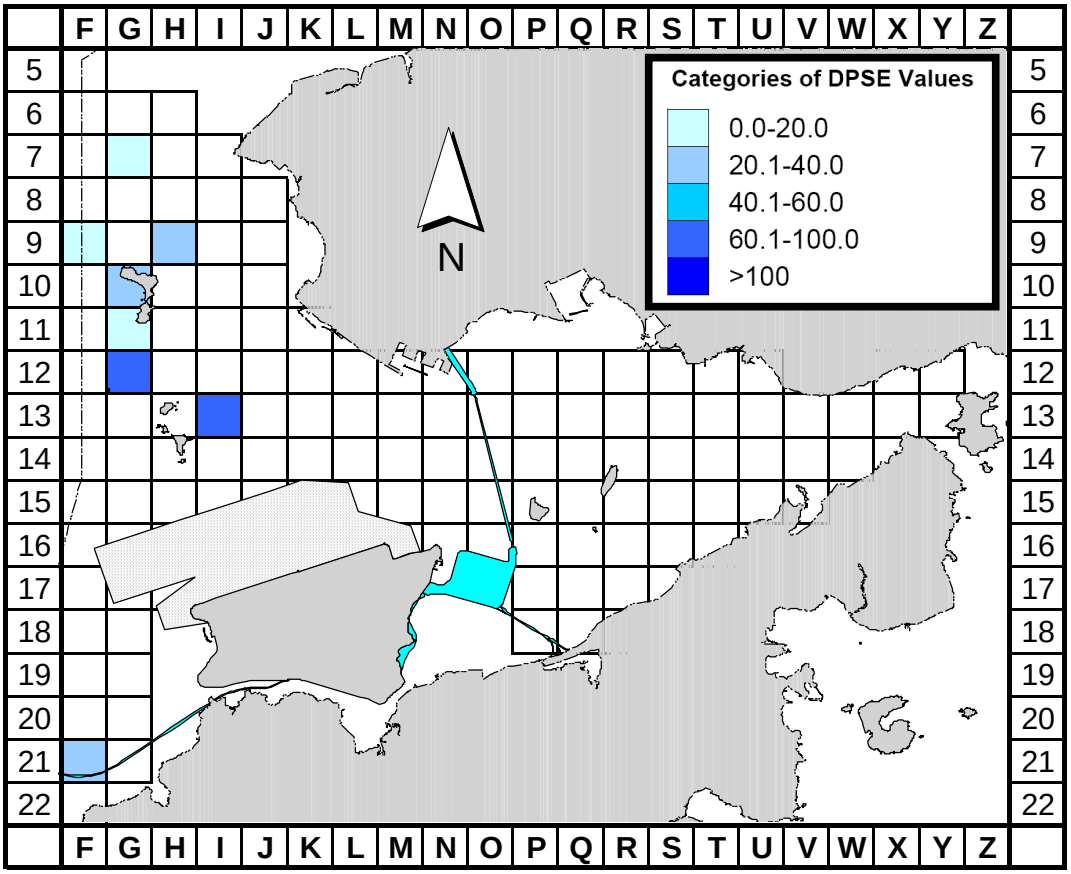


Figure 4b. Density of Chinese white dolphins with corrected survey effort per km^2 in Northeast and Northwest Lantau survey areas, using data collected during present TMCLKL monitoring period (December 2021-February 2022) (DPSE = no. of dolphins per 100 units of survey effort)

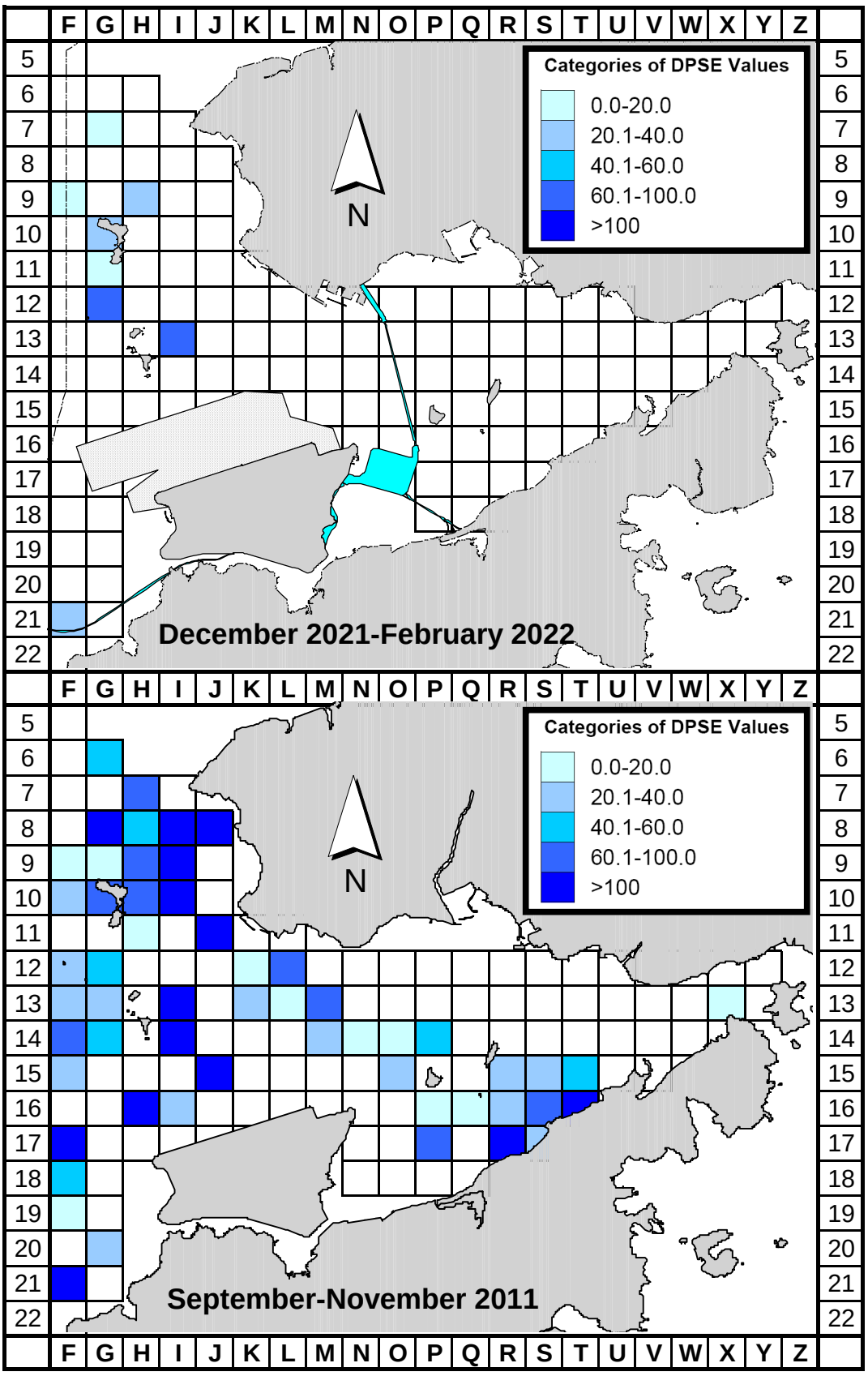


Figure 5. Comparison of density of Chinese white dolphins with corrected survey effort per km^2 in Northwest and Northeast Lantau survey area between present TMCLKL monitoring period (December 2021 - February 2022) and baseline monitoring period (September-November 2011) (DPSE = no. of dolphins per 100 units of survey effort)

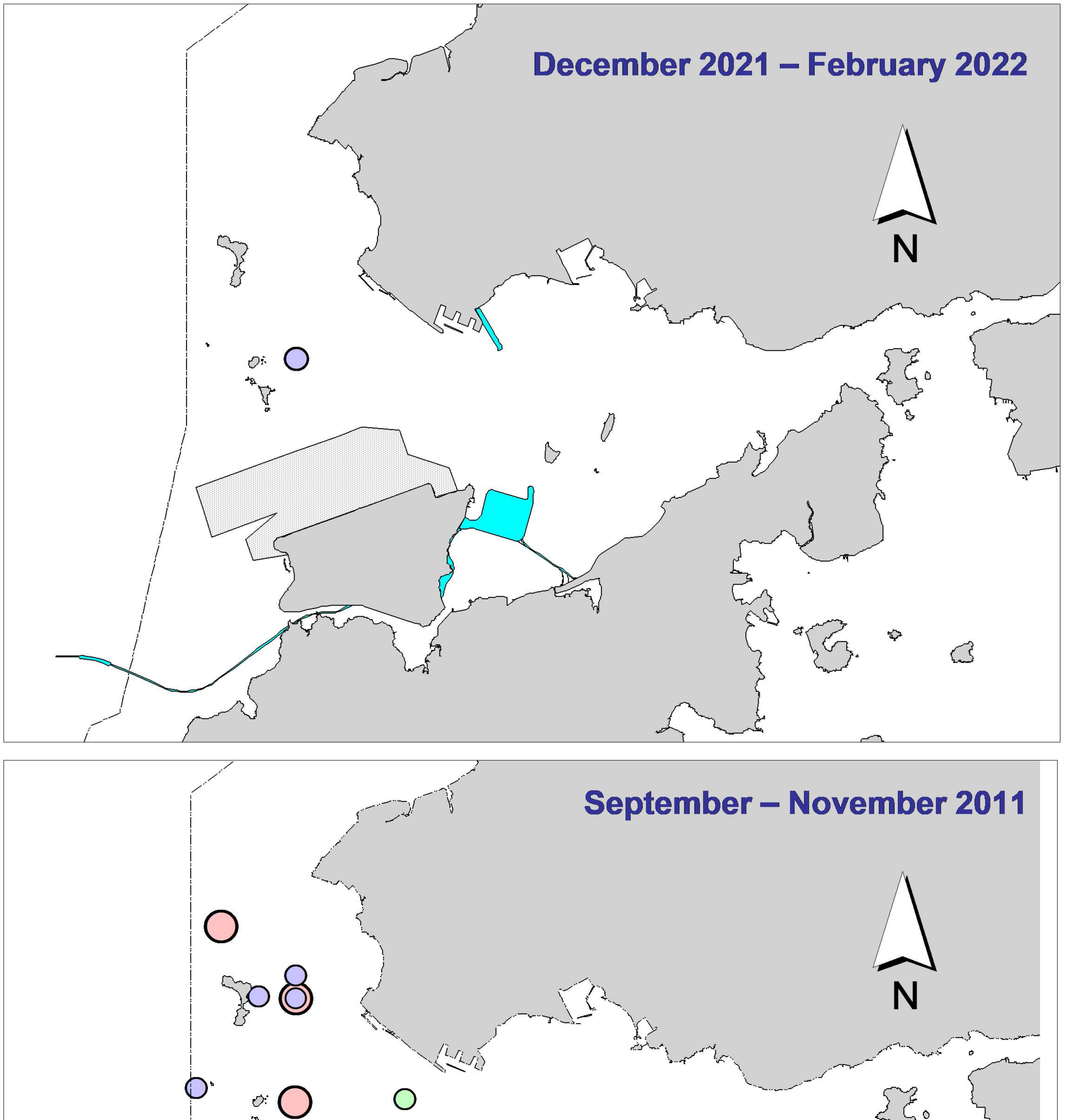


Figure 6. Distribution of Chinese white dolphins engaged in feeding (purple dots), socializing (pink dots) and traveling (green dots) activities during the present TMCLKL monitoring period (top) and baseline period (bottom)

Appendix I. TMCLKL Survey Effort Database (December 2021 - February 2022)

(Abbreviations: BEAU = Beaufort Sea State; P = Primary Line Effort; S = Secondary Line Effort)

DATE	AREA	BEAU	EFFORT	SEASON	VESSEL	TYPE	P/S
2-Dec-21	NW LANTAU	2	16.61	WINTER	STANDARD138716	TMCLKL	P
2-Dec-21	NW LANTAU	3	19.19	WINTER	STANDARD138716	TMCLKL	P
2-Dec-21	NW LANTAU	2	8.40	WINTER	STANDARD138716	TMCLKL	S
2-Dec-21	NW LANTAU	3	5.10	WINTER	STANDARD138716	TMCLKL	S
2-Dec-21	NE LANTAU	2	15.98	WINTER	STANDARD138716	TMCLKL	P
2-Dec-21	NE LANTAU	2	10.62	WINTER	STANDARD138716	TMCLKL	S
3-Dec-21	NW LANTAU	2	2.60	WINTER	STANDARD138716	TMCLKL	P
3-Dec-21	NW LANTAU	3	24.09	WINTER	STANDARD138716	TMCLKL	P
3-Dec-21	NW LANTAU	2	2.70	WINTER	STANDARD138716	TMCLKL	S
3-Dec-21	NW LANTAU	3	8.21	WINTER	STANDARD138716	TMCLKL	S
3-Dec-21	NE LANTAU	2	17.85	WINTER	STANDARD138716	TMCLKL	P
3-Dec-21	NE LANTAU	3	1.50	WINTER	STANDARD138716	TMCLKL	P
3-Dec-21	NE LANTAU	2	7.55	WINTER	STANDARD138716	TMCLKL	S
3-Dec-21	NE LANTAU	3	2.40	WINTER	STANDARD138716	TMCLKL	S
14-Dec-21	NW LANTAU	2	16.31	WINTER	STANDARD36826	TMCLKL	P
14-Dec-21	NW LANTAU	3	10.60	WINTER	STANDARD36826	TMCLKL	P
14-Dec-21	NW LANTAU	2	6.99	WINTER	STANDARD36826	TMCLKL	S
14-Dec-21	NW LANTAU	3	2.00	WINTER	STANDARD36826	TMCLKL	S
14-Dec-21	NE LANTAU	2	14.67	WINTER	STANDARD36826	TMCLKL	P
14-Dec-21	NE LANTAU	3	4.10	WINTER	STANDARD36826	TMCLKL	P
14-Dec-21	NE LANTAU	2	4.23	WINTER	STANDARD36826	TMCLKL	S
14-Dec-21	NE LANTAU	3	6.10	WINTER	STANDARD36826	TMCLKL	S
15-Dec-21	NW LANTAU	2	34.20	WINTER	STANDARD138716	TMCLKL	P
15-Dec-21	NW LANTAU	2	14.30	WINTER	STANDARD138716	TMCLKL	S
15-Dec-21	NE LANTAU	2	16.72	WINTER	STANDARD138716	TMCLKL	P
15-Dec-21	NE LANTAU	2	9.98	WINTER	STANDARD138716	TMCLKL	S
3-Jan-22	NW LANTAU	1	3.14	WINTER	STANDARD36826	TMCLKL	P
3-Jan-22	NW LANTAU	2	21.72	WINTER	STANDARD36826	TMCLKL	P
3-Jan-22	NW LANTAU	2	11.14	WINTER	STANDARD36826	TMCLKL	S
3-Jan-22	NE LANTAU	2	14.45	WINTER	STANDARD36826	TMCLKL	P
3-Jan-22	NE LANTAU	3	4.81	WINTER	STANDARD36826	TMCLKL	P
3-Jan-22	NE LANTAU	2	10.34	WINTER	STANDARD36826	TMCLKL	S
4-Jan-22	NW LANTAU	2	20.76	WINTER	STANDARD36826	TMCLKL	P
4-Jan-22	NW LANTAU	3	14.76	WINTER	STANDARD36826	TMCLKL	P
4-Jan-22	NW LANTAU	2	6.94	WINTER	STANDARD36826	TMCLKL	S
4-Jan-22	NW LANTAU	3	6.70	WINTER	STANDARD36826	TMCLKL	S
4-Jan-22	NE LANTAU	2	9.20	WINTER	STANDARD36826	TMCLKL	P
4-Jan-22	NE LANTAU	3	7.30	WINTER	STANDARD36826	TMCLKL	P
4-Jan-22	NE LANTAU	2	6.53	WINTER	STANDARD36826	TMCLKL	S
4-Jan-22	NE LANTAU	3	3.47	WINTER	STANDARD36826	TMCLKL	S
21-Jan-22	NW LANTAU	2	17.36	WINTER	STANDARD36826	TMCLKL	P
21-Jan-22	NW LANTAU	3	9.05	WINTER	STANDARD36826	TMCLKL	P
21-Jan-22	NW LANTAU	2	10.49	WINTER	STANDARD36826	TMCLKL	S
21-Jan-22	NE LANTAU	2	14.56	WINTER	STANDARD36826	TMCLKL	P
21-Jan-22	NE LANTAU	3	4.79	WINTER	STANDARD36826	TMCLKL	P
21-Jan-22	NE LANTAU	2	10.75	WINTER	STANDARD36826	TMCLKL	S
25-Jan-22	NW LANTAU	2	28.02	WINTER	STANDARD36826	TMCLKL	P
25-Jan-22	NW LANTAU	3	7.68	WINTER	STANDARD36826	TMCLKL	P
25-Jan-22	NW LANTAU	2	13.80	WINTER	STANDARD36826	TMCLKL	S
25-Jan-22	NE LANTAU	1	6.55	WINTER	STANDARD36826	TMCLKL	P
25-Jan-22	NE LANTAU	2	8.92	WINTER	STANDARD36826	TMCLKL	P

Appendix I. (cont'd)

(Abbreviations: BEAU = Beaufort Sea State; P = Primary Line Effort; S = Secondary Line Effort)

DATE	AREA	BEAU	EFFORT	SEASON	VESSEL	TYPE	P/S
25-Jan-22	NE LANTAU	1	5.59	WINTER	STANDARD36826	TMCLKL	S
25-Jan-22	NE LANTAU	2	4.24	WINTER	STANDARD36826	TMCLKL	S
10-Feb-22	NW LANTAU	2	21.03	WINTER	STANDARD36826	TMCLKL	P
10-Feb-22	NW LANTAU	3	5.70	WINTER	STANDARD36826	TMCLKL	P
10-Feb-22	NW LANTAU	2	7.32	WINTER	STANDARD36826	TMCLKL	S
10-Feb-22	NW LANTAU	3	1.55	WINTER	STANDARD36826	TMCLKL	S
10-Feb-22	NE LANTAU	2	18.50	WINTER	STANDARD36826	TMCLKL	P
10-Feb-22	NE LANTAU	2	10.40	WINTER	STANDARD36826	TMCLKL	S
11-Feb-22	NW LANTAU	2	10.84	WINTER	STANDARD36826	TMCLKL	P
11-Feb-22	NW LANTAU	3	24.96	WINTER	STANDARD36826	TMCLKL	P
11-Feb-22	NW LANTAU	2	11.10	WINTER	STANDARD36826	TMCLKL	S
11-Feb-22	NW LANTAU	3	2.60	WINTER	STANDARD36826	TMCLKL	S
11-Feb-22	NE LANTAU	2	16.21	WINTER	STANDARD36826	TMCLKL	P
11-Feb-22	NE LANTAU	2	9.39	WINTER	STANDARD36826	TMCLKL	S
24-Feb-22	NW LANTAU	2	18.70	WINTER	STANDARD36826	TMCLKL	P
24-Feb-22	NW LANTAU	3	16.54	WINTER	STANDARD36826	TMCLKL	P
24-Feb-22	NW LANTAU	2	8.70	WINTER	STANDARD36826	TMCLKL	S
24-Feb-22	NW LANTAU	3	5.16	WINTER	STANDARD36826	TMCLKL	S
24-Feb-22	NE LANTAU	2	7.92	WINTER	STANDARD36826	TMCLKL	P
24-Feb-22	NE LANTAU	3	7.07	WINTER	STANDARD36826	TMCLKL	P
24-Feb-22	NE LANTAU	2	8.90	WINTER	STANDARD36826	TMCLKL	S
24-Feb-22	NE LANTAU	3	1.11	WINTER	STANDARD36826	TMCLKL	S
25-Feb-22	NW LANTAU	2	16.14	WINTER	STANDARD36826	TMCLKL	P
25-Feb-22	NW LANTAU	3	9.58	WINTER	STANDARD36826	TMCLKL	P
25-Feb-22	NW LANTAU	2	7.22	WINTER	STANDARD36826	TMCLKL	S
25-Feb-22	NW LANTAU	3	3.36	WINTER	STANDARD36826	TMCLKL	S
25-Feb-22	NE LANTAU	2	17.97	WINTER	STANDARD36826	TMCLKL	P
25-Feb-22	NE LANTAU	3	1.00	WINTER	STANDARD36826	TMCLKL	P
25-Feb-22	NE LANTAU	2	7.73	WINTER	STANDARD36826	TMCLKL	S
25-Feb-22	NE LANTAU	3	2.60	WINTER	STANDARD36826	TMCLKL	S

Appendix II. TMCLKL Chinese White Dolphin Sighting Database (December 2021 - February 2022)

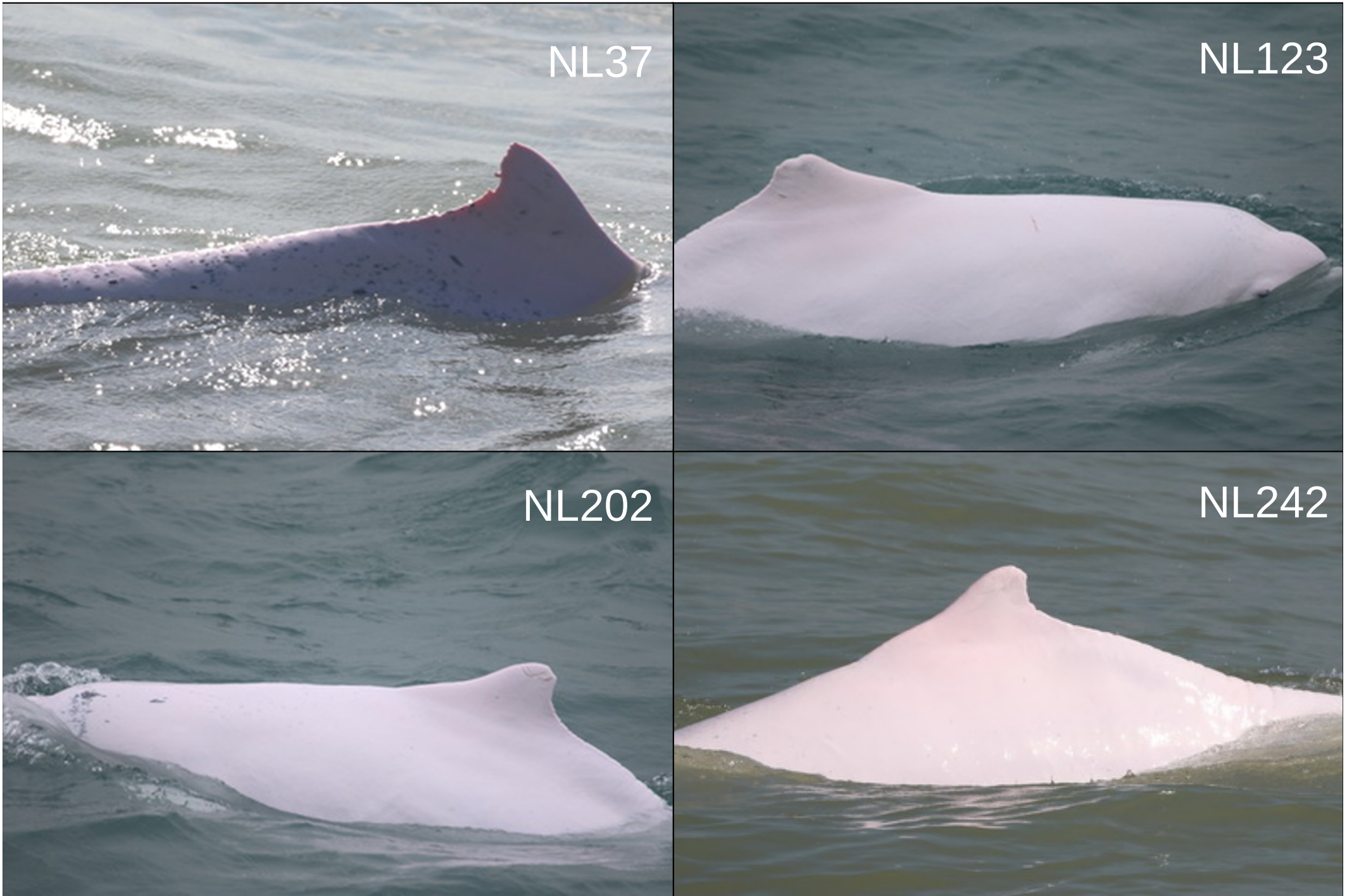
(Abberviations: STG# = Sighting Number; HRD SZ = Dolphin Herd Size; BEAU = Beaufort Sea State; PSD = Perpendicular Distance; BOAT ASSOC. = Fishing Boat Association; P/S: Sighting Made on Primary/Secondary Lines)

DATE	STG #	TIME	HRD SZ	AREA	BEAU	PSD	EFFORT	TYPE	NORTHING	EASTING	SEASON	BOAT ASSOC.	P/S
3-Jan-22	1	1104	1	NW LANTAU	2	142	ON	TMCLKL	826896	805262	WINTER	NONE	S
3-Jan-22	2	1116	2	NW LANTAU	2	392	ON	TMCLKL	827559	806169	WINTER	NONE	P
4-Jan-22	1	1020	2	NW LANTAU	2	28	ON	TMCLKL	815381	804682	WINTER	NONE	P
4-Jan-22	2	1205	4	NW LANTAU	2	1394	ON	TMCLKL	824649	805165	WINTER	NONE	S
21-Jan-22	1	1048	1	NW LANTAU	3	99	ON	TMCLKL	825047	805464	WINTER	NONE	P
10-Feb-22	1	1141	6	NW LANTAU	2	106	ON	TMCLKL	823813	807542	WINTER	NONE	P
24-Feb-22	1	1106	1	NW LANTAU	2	125	ON	TMCLKL	827629	804615	WINTER	NONE	P
25-Feb-22	1	1113	1	NW LANTAU	2	132	ON	TMCLKL	829288	805462	WINTER	NONE	P

Appendix III. Individual dolphins identified during TMCLKL monitoring surveys in December 2021 - February 2022

ID#	DATE	STG#	AREA
NL37	04/01/22	2	NW LANTAU
	10/02/22	1	NW LANTAU
NL123	03/01/22	1	NW LANTAU
	04/01/22	2	NW LANTAU
	10/02/22	1	NW LANTAU
NL202	10/02/22	1	NW LANTAU
NL242	04/01/22	2	NW LANTAU
NL259	21/01/22	1	NW LANTAU
WL11	04/01/22	2	NW LANTAU
WL79	03/01/22	2	NW LANTAU
	10/02/22	1	NW LANTAU
WL167	10/02/22	1	NW LANTAU
WL179	03/01/22	2	NW LANTAU
	25/02/22	1	NW LANTAU
WL254	10/02/22	1	NW LANTAU
WL294	04/01/22	1	NW LANTAU

Appendix IV. Eleven individual dolphins that were identified between December 2021 and February 2022 during the TMCLKL monitoring surveys



Appendix IV. (cont'd)

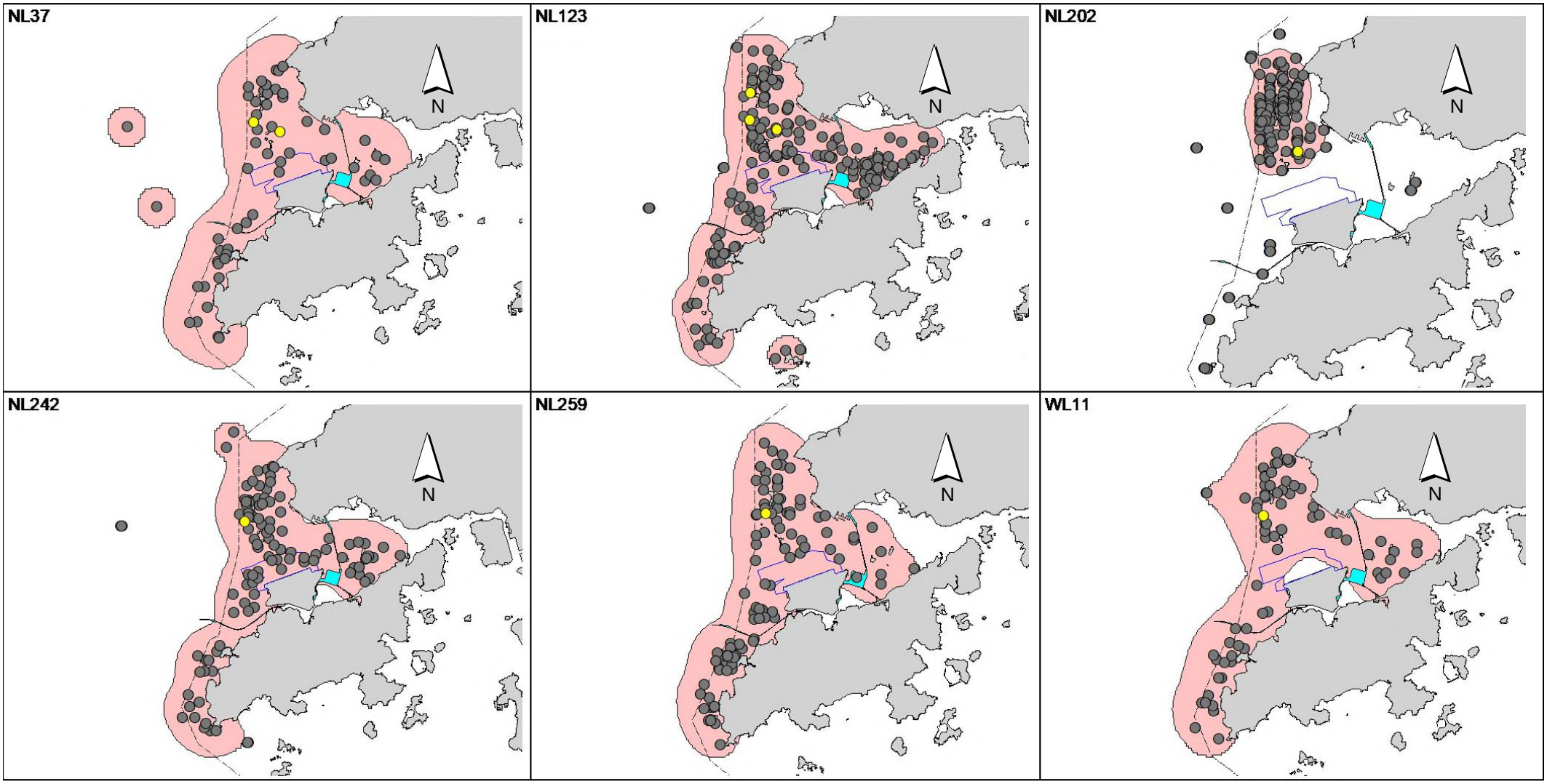

WL179


WL254

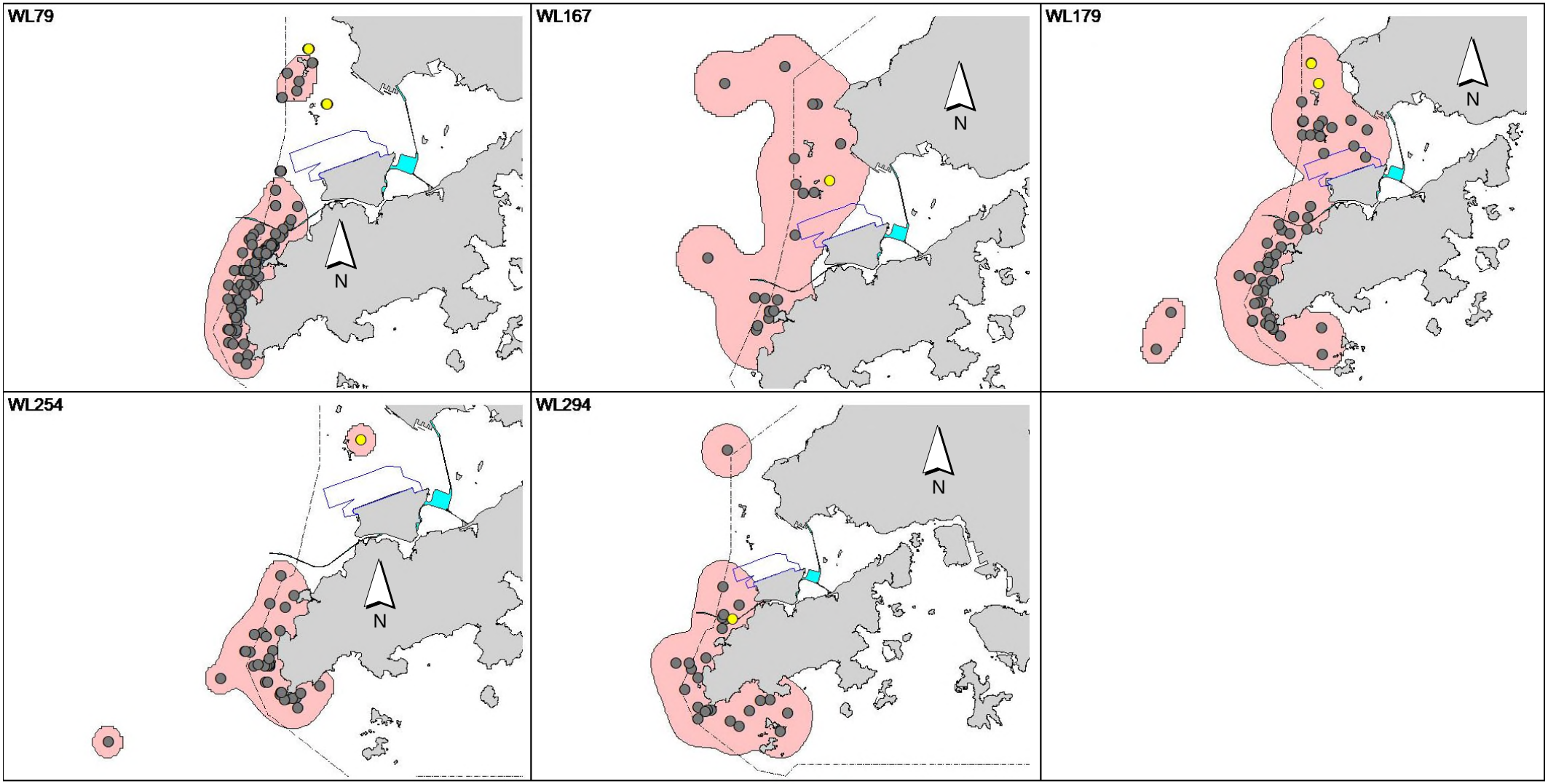

WL294

Appendix V. Ranging patterns (95% kernel ranges) of 11 individual dolphins that were sighted during the present TMCLKL monitoring period

(note: yellow dots indicate sightings made in December 2021-February 2022 during TMCLKL monitoring surveys)



Appendix V. (cont'd)



Appendix D

Cumulative Statistics on Exceedances, Complaints, Notifications of Summons and Successful Prosecutions

Table D1 *Cumulative Statistics on Exceedances*

Monitoring Parameters	Action/Limit Level	Total No. recorded in this reporting quarter	Total No. recorded since Contract commencement
Post Construction (Operational) Dolphin Monitoring	Action	0	0
	Limit	1	2

Table D2 *Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions*

Reporting Period	Cumulative Statistics		
	Complaints	Notifications of Summons	Successful Prosecutions
This Reporting Period (December 2021 to February 2022)	0	0	0
Total No. received since Contract commencement	0	0	0

Email message

Environmental Resources Management

2509, 25/F One Harbourfront
18 Tak Fung Street
Hunghom, Kowloon
Hong Kong
Telephone: (852) 2271 3000
Facsimile: (852) 3015 8052

To	Ramboll Hong Kong, Limited (ENPO)
From	ERM- Hong Kong, Limited
Ref/Project number	Agreement No. HMWSD 1/2021 (EP) Post-Construction Monitoring of Chinese White Dolphin (Line-transect Vessel Surveys) for Tuen Mun – Chek Lap Kok Link in Northeast and Northwest Lantau Survey Area - Investigation
Subject	Notification of Exceedance for Post Construction (Operational) Dolphin Monitoring
Date	16 March 2022

Dear Sir or Madam,

Please find attached the Notification of Exceedance (NOE) of the following Log no.:

0611663_December2021/February2022_dolphin_STG&ANI_NEL&NWL

A total of one limit level exceedance was recorded in the quarterly post construction (operational) dolphin monitoring data between December 2021 and February 2022.

Regards,

Dr Jasmine Ng
Environmental Team Leader

CONFIDENTIALITY NOTICE
This facsimile transmission is intended only for the use of the addressee and is confidential. If you are not the addressee it may be unlawful for you to read, copy, distribute, disclose or otherwise use the information in this facsimile. If you are not the intended recipient, please telephone or fax us.

ERM-Hong Kong, Limited

AGREEMENT NO. HMWSD 1/2021 (EP)
POST-CONSTRUCTION MONITORING OF CHINESE WHITE DOLPHIN (LINE-TRANSECT VESSEL SURVEYS) FOR TUEN MUN – CHEK LAP KOK LINK IN NORTHEAST AND NORTHWEST LANTAU SURVEY AREA - INVESTIGATION

Post Construction Dolphin Monitoring
Notification of Exceedance

Log No.	**0611663_ Dec2021/Feb2022_dolphin_STG&ANI_NEL&NWL** **[Total No. of Exceedances = 1 Limit Level Exceedance]**	
Date	December 2021 – February 2022 (monitored) 16 March 2022 (results received by ERM)	
Monitoring Area	Northeast Lantau (NEL) and Northwest Lantau (NWL)	
Parameter(s) with Exceedance(s)	Quarterly encounter rate of dolphin sightings (STG) Quarterly encounter rate of total number of dolphins (ANI)	
Action Levels	North Lantau Social cluster	NEL: STG < 4.2 & ANI < 15.5 or NWL: STG < 6.9 & ANI < 31.3
Limit Levels		NEL: STG < 2.4 & ANI < 8.9 and NWL: STG < 3.9 & ANI < 17.9
Recorded Levels	NEL	STG = 0 & ANI = 0
	NWL	STG = 0.55 & ANI = 1.09
	One Limit Level Exceedance was recorded in the quarterly post construction dolphin monitoring at NEL and NWL between December 2021 and February 2022.	
Statistical Analyses	Further to the review of the available and relevant dolphin monitoring data for TMCLKL project, statistical analyses were conducted as follows: • A two-way ANOVA with repeated measures and unequal sample size was conducted using Period (2 levels: baseline vs present post construction quarter, December 2021 and February 2022) and Location (2 levels: NEL and NWL) as fixed factors to examine whether there were any significant differences in the average encounter rates between the baseline and present post construction monitoring quarter. By setting $\alpha = 0.01$ as the significance level in the statistical tests, significant differences in STG ($p = 0.0031$) and ANI ($p = 0.0113$) were detected between Periods. • A two-way ANOVA with repeated measures and unequal sample size was conducted using Cumulative Period (2 levels: the first 37 quarters of impact and post construction phases of HKLR03/TMCLKL08) and Location (2 levels: NEL and NWL) as fixed factors to examine whether there were any significant differences in the average encounter rates between the baseline and cumulative quarters. By setting $\alpha = 0.00001$ as the significance level in the statistical tests, significant difference in STG ($p = 0.000000$) and in ANI ($p = 0.000000$) between Cumulative Period and Location were detected. *Note: Operational phase dolphin monitoring between June 2020 and August 2021 were conducted under Contract No. HY/2012/08 and operational phase dolphin monitoring between September 2021 and May 2022 were/will be conducted under Agreement No. HMWSD 1/2021 (EP).	

Works Undertaken (in the monitoring quarter)	No marine works was undertaken in the reporting period under Agreement No. HMWSD 1/2021 (EP). No marine works was undertaken in the reporting period under Contract No. HY/2012/08. Operational phase dolphin monitoring commenced in June 2020. Termination proposal for construction EM&A programme was approved by EPD on 19 March 2021. The construction phase EM&A programme of Contract No. HY/2012/08 has been terminated since 19 March 2021. No marine works was undertaken in the reporting period under Contract No. HY/2012/07. Termination proposal for construction EM&A programme of Contract No. HY/2012/07 was approved by EPD on 16 March 2020. The construction phase EM&A programme of Contract No. HY/2012/07 has been terminated since 16 March 2020.
Possible Reason for Action or Limit Level Exceedance(s)	The exceedance recorded in the quarterly post construction dolphin monitoring is unlikely to be due to TMCLKL project, in view of the following: • Marine works of TMCLKL project: No marine works was undertaken in the reporting period under Agreement No. HMWSD 1/2021 (EP). Marine works were completed and no marine vessels will be deployed under Contract No. HY/2012/08 as per confirmed by SOR on 17 April 2020. The Proposal for operational phase dolphin monitoring was approved by EPD on 19 May 2020. Operational phase dolphin monitoring commenced in June 2020. Termination proposal for construction EM&A programme was approved by EPD on 19 March 2021. The construction phase EM&A programme of the Contract has been terminated since 19 March 2021. No marine works was undertaken in the reporting period under Contract No. HY/2012/07. Termination proposal for construction EM&A programme of Contract No. HY/2012/07 was approved by EPD on 16 March 2020. The construction phase EM&A programme of Contract No. HY/2012/07 has been terminated since 16 March 2020. During this quarter of dolphin monitoring, no adverse impact on CWD due to the activities under TMCLKL project was observed. • Impact on water quality: Marine works were completed and no marine vessels will be deployed under TMCLKL project. The Proposal for operational phase water quality monitoring was approved by EPD on 19 May 2020. Operational phase water quality monitoring commenced in June 2020 and completed in May 2021 (monitoring conducted under Contract No. HY/2012/08). • Provision of Marine Park: The Government has designated the Brothers Islands as a marine park in December 2016, with the aim to help better conserve the Chinese White Dolphins, their habitats and enhance the marine and fisheries resources therein. In view of the above, no unacceptable impact on CWD or its habitat was associated with TMCLKL project in this quarter.
Actions Taken / To Be Taken	No marine works and vessels was undertaken/deployed in the reporting period. The ET will monitor for future trends in exceedances.
Remarks	The results of post construction dolphin monitoring are documented in the approved *Fourth* to *Sixth Monthly EM&A Reports*.